DESIGN-BUILD AGREEMENT

Eric Hamber Secondary School Replacement Project

BOARD OF EDUCATION OF SCHOOL DISTRICT NO. 39 (VANCOUVER)

and

Bird Design-Build Construction Inc.

Dated: April 30, 2020

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DESIGN BUILD AGREEMENT

THIS AGREEMENT dated for reference as of April 30, 2020 (the "**Effective Date**") is entered into:

BETWEEN:

Board of Education of School District No. 39 (VANCOUVER)

(the "**Owner**")

AND:

Bird Design-Build Construction Inc.

(the "**Design-Builder**")

WHEREAS:

A. The Owner has selected the Design-Builder to perform all Work for the Project referred to as the "**Eric Hamber Secondary School Replacement Project**", as further described in this Agreement; and

B. The parties wish to enter into this Agreement to set out their respective rights and obligations.

NOW THEREFORE in consideration of the premises and the mutual obligations contained in this Agreement, the parties agree as follows:

PART A – DEFINITIONS AND INTERPRETATION

1. DEFINITIONS AND INTERPRETATION

1.1 In this Agreement, the following words and expressions have the following meanings:

"**Agreement**" means this agreement, including the documents referred to in Section 1.2;

"**Apprenticeship Policy**" has the meaning set out in Schedule 8 - Apprenticeship Policy;

"**Arborist Report**" means the report entitled 190516 - DHC Arborist Report - Eric Hamber School, Vancouver_FINAL (Diamond Head Consulting Ltd.) June 5, 2019;

"**Architect**" means a professional architect registered and in good standing under the *Architects Act* (British Columbia);

"**BC Hydro**" means British Columbia Hydro and Power Authority;

"**Bonds**" has the meaning set out in Section 59.1;

"**Business Day**" means a day other than a Saturday, Sunday or statutory holiday in British Columbia;

"**Change**" means a change in the Work, including any addition, deletion, alteration, revision or substitution;

"**Change Directive**" means a written instruction referenced as a "**Change Directive**" executed by the Owner and directing the Design-Builder to proceed with a Change;

"**Change Order**" means a written document referenced as a "**Change Order**" executed by the Owner and the Design-Builder and setting out a Change and the value or method of valuation of a Change and any adjustments to the Contract Price and Contract Time;

"**Childcare Centre**" means the portion of the Facility to be used as a childcare centre, as is described in the Statement of Requirements, including Appendix 1E – Childcare Centre Requirements;

"**City Resolution Notice**" has the meaning set out in Section 63.3(b)(ii);

"**Commissioning Plan**" has the meaning set out in Section 32.1;

"**Confidential Information**" means information of a party that the party has designated as confidential at the time of disclosure and which is supplied, or to which access is granted, to or on behalf of the other party (whether before or after the Effective Date), either in writing, or in any other form, directly or indirectly pursuant to discussions with the other party and includes all analyses, compilations, studies and other documents whether prepared by or on behalf of a party which contain or otherwise reflect or are derived from such designated information;

"**Construction**" means all things, other than Design, necessary to complete the Work;

"**Contaminants**" means any materials, substances or hazardous wastes, the storage, manufacture, disposal, treatment, generation, use, transport, remediation or release into the environment of which is now or hereafter prohibited, controlled or regulated under the *Environmental Management Act* (British Columbia) and regulations;

"**Contract Price**" means the price set out in Section 2.1;

"**Contract Time**" means the time within which the Design-Builder will achieve Substantial Completion as set out in Section 3.1;

"**COVID-19 Pandemic**" means the novel coronavirus COVID-19 pandemic declared March 11, 2020 by the World Health Organization until such time as the World Health Organization designates or declares the COVID-19 post-pandemic phase;

"**Credit Provider**" has the meaning set out in Section 11.2;

"**Design**" means the design for the Project;

"**Design-Builder**" has the meaning set out on the first page of this Agreement;

"**Design-Builder's Consultant**" means KMBR Architects Planners Inc. as the principal Architect and coordinating professional and any other architectural or engineering firm or person, including any Architect or Professional Engineer, engaged by the Design-Builder to prepare the Drawings and Specifications, or to otherwise consult to the Design-Builder on the Project;

"**Design-Builder's Representative**" has the meaning set out in Section 5.2;

"**Disclosed Data**" means any information, data and documents (including in any electronic format) made available or issued to the Design-Builder or any Subcontractor or other person on behalf of the Design-Builder or any Subcontractor in connection with the Project by or on behalf of the Owner, including any information relating to the Land or the requirements of any governmental authority, whether before or after the Effective Date;

"**Dispute**" means any disagreement, failure to agree or other dispute between the Owner and the Design-Builder arising out of or in connection with this Agreement, including in respect of the interpretation, breach, performance, validity or termination of this Agreement, whether in the law of contract or any other area of law;

"**Drawings**" means all drawings for the Project that are prepared by or for the Design-Builder and submitted to the Owner under the Review Procedure and that the Design-Builder is entitled to proceed with under the Review Procedure;

"**Effective Date**" has the meaning set out on the first page of this Agreement;

"**End Date**" means the date described in Section 4.1;

"**Environmental Reports**" has the meaning set out in Section 29.1(a);

"**Existing School**" means the Eric Hamber Secondary School existing as of the Effective Date located at 5025 Willow Street, Vancouver, BC V5Z 3S1;

"**Facility**" means the School, Childcare Centre and related structures, utility connections, landscaping and other improvements to be constructed by the Design-Builder pursuant to this Agreement;

"**Financial Submission Date**" means February 11, 2020;

"**FIPPA**" means the *Freedom of Information and Protection of Privacy Act* (British Columbia);

"**Force Majeure**" means labour disputes, strikes, lock-outs, the COVID-19 Pandemic, fire, unusual delay by common carriers or unavoidable casualties or, without limiting any of the foregoing, a cause beyond the Design-Builder's reasonable control, but excludes:

(i) any event that is the result of breach of this Agreement or Law;

(ii) economic hardship or lack of financing;

(iii) equipment failure;

(iv) unavailability of personnel, labour or Subcontractors;

(v) unavailability of materials;

(vi) labour disputes, strikes or lock-outs of the personnel of the Design-Builder or the Subcontractors;

(vii) delays resulting from adverse weather conditions; and

(viii) unsuitable or unanticipated Site conditions, including subsurface conditions;

"**GST**" means the goods and services tax imposed pursuant to Section IX of the *Excise Tax Act* (Canada);

"**Health and Safety Plan**" has the meaning set out in Section 30.5;

"**Indemnified Parties**" has the meaning set out in Section 57.1;

"**Insurance Conditions**" means the terms and conditions set out in Schedule 3 – Insurance Conditions;

"**Key Individuals**" means the persons identified in Schedule 5 – Key Individuals;

"**Land**" means the lands legally described as Block 897, District Lot 526, Plan 10770, Metro Vancouver Regional District, PID 009-348-654;

"**Laws**" means the common law and any and all laws, statutes, enactments, by-laws, regulations, rules, orders, directives, policies, permits, licences, codes and rulings of any government, and any ministries, agencies, board, commission or tribunal of any government;

"**LD Holdback**" has the meaning set out in Section 42.1.

"**LEED Gold Certification**" means the award of a LEED Gold certification from the USGBC under the LEED Rating System;

"**LEED Rating System**" means USGBC's Leadership in Energy & Environmental Design (LEED) Green Building Rating System, v4;

"**Lien Holdback**" means the 10% holdback required under the *Builders Lien Act* (British Columbia);

"**Off-Site Work Notice**" has the meaning set out in Section 63.3(b)(i);

"**Other Contractor**" means any person employed by or having a separate contract directly or indirectly with the Owner for work related to the Project, other than the Work;

"**Owner**" has the meaning set out on the first page of this Agreement;

"**Owner's Consultant**" means Stantec Consulting Ltd. unless replaced in accordance with Section 5.4;

"**Owner's Representative**" has the meaning set out in Section 5.1;

"**Payment Certifier**" means SSA Quantity Surveyors Ltd. unless replaced in accordance with Section 5.6;

"**Performance Holdbacks**" has the meaning set out in Section 42.1;

"**Professional Engineer**" means a professional engineer registered and in good standing under the *Engineers and Geoscientists Act* (British Columbia);

"**Project**" means the design, construction, testing and commissioning of the Facility and all other works in accordance with this Agreement;

"**Project Binder**" has the meaning set out in Section 44.1;

"**Project Credits**" means any incentive, income, credit, rebate, right, benefit or advantage provided by a governmental authority or industry group relating to energy, design, materials or environmental matters, including means of production of energy, input sources, use of products or materials, efficiencies, type and level of emissions, and compliance with any energy or environmental laws, regulations, rules or orders;

"**Project Management Plan**" means the management plan that (i) sets out a high level workplan to describe the manner in which the Design-Builder will manage the Project, including to address related matters such as traffic management and communications, and (ii) is prepared by or for the Design-Builder and submitted to the Owner;

"**Proposal Extracts**" means Schedule 7 – Proposal Extracts;

"**PST**" means the tax under the *Provincial Sales Tax Act* (British Columbia) and any regulation thereunder, including any transition provisions;

"**Quality Management Plan**" means the plan for quality management including quality control and quality assurance with respect to the Work, a draft of which is included in the Proposal Extracts, together with such changes to the plan that are prepared by the Design-Builder and submitted to the Owner under the Review Procedure and that the Design-Builder is entitled to proceed with under the Review Procedure;

"**Record Drawings**" means the as-built Drawings and Specifications that record the completed Facility;

"**Review Procedure**" means Schedule 2 – Review Procedure;

"**Schedule of Values**" means the schedule to be provided by the Design-Builder pursuant to Section 39.4 and reviewed by the Owner under the Review Procedure that allocates the Contract Price set out in Schedule 6 – Schedule of Prices over the course of the Project and that is the basis for monthly payments by the Owner for Work properly performed pursuant to this Agreement;

"**School**" means all portions of the Facility other than the Childcare Centre;

"**Site**" means the place where the Construction is to be performed on the Land as indicated on the Site Plan, together with, as indicated from time to time, other such areas that the Design-Builder may be permitted to access for purposes of Construction in accordance with a Work Plan pursuant to Section 24.2;

"**Site Occupation Date**" means the date upon which the Design-Builder has obtained all rights, permits, licences and approvals from governmental authorities, including the City of Vancouver (but, for certainty, excluding the Owner), which are required to commence physical construction of the Facility on the Site;

"**Site Plan**" means the plan of the Site attached as Schedule 9 - Site Plan to this Agreement;

"**Site Reports**" means the following reports:

(i) Geotechnical Assessment for Eric Hamber Secondary School Replacement, Vancouver, B.C. (Thurber Engineering Ltd.), October 2017;

(ii) the Arborist Report;

(iii) Preliminary Geotechnical Investigation Seismic Project Information Report (SPIR) Eric Hamber Secondary School (Centennial Geotechnical Engineers Ltd.), January 10, 2014

(iv) Thurber_20191010_EHS Factual Report for Additional Drilling_27267, October 10, 2019; and

(v) Thurber_20191122_EHS Arsenic Investigation_27267, November 22, 2019.

"**Specifications**" means all construction and other specifications for the Project prepared by or for the Design-Builder and submitted to the Owner under the Review Procedure and that the Design-Builder is entitled to proceed with under the Review Procedure;

"**Standards**" means any and all Laws, professional standards and specifications applicable to the Work, or to work such as the Project, as they are in force from time to time in the latest current version thereof;

"**Statement of Requirements**" means Schedule 1 – Statement of Requirements;

"**Subcontract**" means a contract with a Subcontractor;

"**Subcontractor**" means a person or entity, including the Design-Builder's Consultant, having a contract with the Design-Builder or with a subcontractor of any tier to perform a part or parts of the Work or to supply products or materials for the Work;

"**Submittal**" means any and all items, documents and anything else required or specified by this Agreement (including by Section 16), and any and all subsequent revisions, amendments and changes thereto, in respect of the Design and the Construction to be submitted to, reviewed, accepted or otherwise processed or considered by the Owner;

"**Submittal Schedule**" has the meaning set out in Section 1.1 of Schedule 2 – Review Procedure;

"**Substantial Completion**" has the meaning set out in Section 43.2;

"**Substantial Completion Certificate**" means the certificate issued to the Design-Builder by the Payment Certifier upon the achievement of Substantial Completion, as described in this Agreement;

"**Substantial Completion Date**" means the date that Substantial Completion has been achieved by the Design-Builder, as set out in the Substantial Completion Certificate;

"**Target Substantial Completion Date**" has the meaning set out in Section 3.1;

"**Term**" means the period commencing on the Effective Date and ending on the End Date;

"**Time Schedule**" means the general schedule for timing of the Work as set out in the Proposal Extracts and as updated pursuant to Section 7;

"**Total Completion**" has the meaning set out in Section 43.11;

"**Total Completion Certificate**" means the certificate issued to the Design-Builder by the Payment Certifier upon the achievement of Total Completion;

"**Total Completion Date**" means the date that Total Completion has been achieved, as set out in the Total Completion Certificate;

"**User Consultation Groups**" has the meaning set out in Section 4 of Schedule 2 – Review Procedure;

"**USGBC**" means the U.S. Green Building Council;

"**VBBL**" means the City of Vancouver Building Bylaw version adopted at time of building permit application;

"**Warranty Holdback**" has the meaning set out in Section 42.1;

"**Warranty Period**" means the period defined in Section 37.1 during which the Design-Builder is required to repair any deficiencies or defects that arise in the Work;

"**Work**" means everything to be undertaken by the Design-Builder under this Agreement;

"**Work Plan**" has the meaning set out in Section 24.2; and

"**Workers' Compensation Board**" or "**WorkSafe BC**" means the board constituted pursuant to the *Workers Compensation Act* (British Columbia).

1.2 This Agreement includes the following schedules and all sub-schedules, appendices and attachments to those schedules:

(a) Schedule 1 - Statement of Requirements;

(b) Schedule 2 - Review Procedure;

(c) Schedule 3 - Insurance Conditions;

(d) Schedule 4 - Communication Roles;

(e) Schedule 5 - Key Individuals;

(f) Schedule 6 - Schedule of Prices;

(g) Schedule 7 - Proposal Extracts;

(h) Schedule 8 - Apprenticeship Policy;

(i) Schedule 9 - Site Plan; and

(j) Schedule 10 - Cleaning and Waste Management.

1.3 This Agreement will be interpreted according to the following provisions, except to the extent the context or the express provisions of this Agreement otherwise require:

(a) no rule of law will apply that would construe this Agreement or any part of it against the party who (or whose counsel) drafted, prepared or put forward the Agreement or any part of it;

(b) the table of contents, headings and sub-headings, marginal notes and references to them in this Agreement are for convenience of reference only, do not constitute a part of this Agreement and will not be taken into consideration in the interpretation or construction of, or affect the meaning of, this Agreement;

(c) neither the organization of the Statement of Requirements, the Proposal Extracts or any other documents included in this Agreement into divisions, sections and parts, or the arrangement of drawings or specifications included in this Agreement will control the Design-Builder in dividing the Work among Subcontractors or in establishing the Work to be performed by a trade;

(d) each reference to a Section or Schedule is a reference to a Section of or Schedule to this Agreement;

(e) a Schedule includes all of the sub-schedules, appendices and other attachments attached to that Schedule;

(f) each reference to an agreement, document, standard, principle or other instrument includes (subject to all relevant approvals and any other provisions of this Agreement expressly concerning such agreement, document, standard, principle or other instrument) a reference to that agreement, document, standard, principle or instrument as amended, supplemented, substituted, novated or assigned;

(g) each reference to a statute or statutory provision (including any subordinate legislation) includes any statute or statutory provision which amends, extends, consolidates or replaces the statute or statutory provision or which has been amended, extended, consolidated or replaced by the statute or statutory provision and includes any orders, regulations, by-laws, ordinances, orders, codes of practice, instruments or other subordinate legislation made under the relevant statute;

(h) each reference to time of day is a reference to Pacific Standard Time or Pacific Daylight Saving Time, as the case may be;

(i) words importing the singular include the plural and vice versa;

(j) words importing a particular gender include all genders;

(k) each reference to a public organization is deemed to include a reference to any successor(s) to such public organization or any organization or entity or organizations or entities which has or have taken over the functions or responsibilities of such public organization;

(l) unless the context otherwise requires, each reference to "parties" means the parties to this Agreement and each reference to a "party" means any one of the parties to this Agreement, provided however that a reference to a third party does not mean a party to this Agreement;

(m) all monetary amounts are expressed in Canadian Dollars;

(n) whenever this Agreement obliges a party (the "**Payor**") to pay any amount to the other party (the "**Payee**") in respect of any costs, expenses, fees, charges, liabilities, losses, claims or other sums incurred by the Payee:

(i) such obligation will be construed as applying only to so much of such sums as have been properly incurred on an arm's length commercial basis or, where not incurred on an arm's length commercial basis (including when the payment is made to an affiliate of the Payee), so much of them as are proper and reasonable; and

(ii) the Payee will, when requested by the Payor, provide supporting evidence of such costs, expenses, fees, charges, liabilities, losses, claims or other sums;

(o) the Owner will not be imputed with knowledge of any fact, matter or thing unless that fact, matter or thing is within the actual knowledge of any of those of its employees or agents (including the Owner's Representative) who have responsibilities in connection with the conduct of the Work;

(p) without limiting the extent of its actual knowledge, the Design-Builder will for all purposes of this Agreement be deemed to have such knowledge in respect of the Work as is held (or ought reasonably to be held) by all persons involved in carrying out the Work including the Design-Builder and the Subcontractors (including the Design-Builder's Consultant) and the officers, agents, employees or workers of any of them;

(q) each requirement for a thing or action to be "in accordance with" or "in compliance with" any standard, code or specification or other requirement or stipulation means that such thing or action is to exceed or at least equal that standard, code, specification or other requirement or stipulation;

(r) the words "include", "includes" and "including" are to be construed as meaning "include without limitation", "includes without limitation" and "including without limitation", respectively;

(s) the terms "will", "shall" and "must" are synonymous;

(t) the Statement of Requirements includes provisions written in the imperative, and all such provisions will be construed as obligations of the Design-Builder;

(u) when a party has "discretion", it means that party has the sole, absolute and unfettered discretion, with no requirement to act reasonably or provide reasons unless specifically required under the provisions of this Agreement;

(v) any consent contemplated to be given under this Agreement must be in writing;

(w) general words are not given a restrictive meaning:

(i) if they are introduced by the word "other", by reason of the fact that they are preceded by words indicating a particular class of act, matter or thing; or

(ii) by reason of the fact that they are followed by particular examples intended to be embraced by those general words;

(x) words or abbreviations which have well-known technical or trade meanings are used in accordance with those meanings;

(y) the expression "all reasonable efforts" and expressions of like import, when used in connection with an obligation of either of the parties, means taking in good faith and with due diligence all commercially reasonable steps to achieve the objective and to perform the obligation, including doing all that can reasonably be done in the circumstances taking into account each party's obligations hereunder to mitigate delays and additional costs to the other party, and in any event taking no less steps and efforts than those that would be taken by a commercially reasonable and prudent person in comparable circumstances but where the whole of the benefit of the obligation and where all the results of taking such steps and efforts accrued solely to that person's own benefit, provided that the foregoing will not require the Owner to:

(i) take any action which is contrary to the public interest, as determined by the Owner in its discretion; or

(ii) undertake any mitigation measure that might be available arising out of its status as a public body that would not normally be available to a private commercial party;

(z) the expressions “by the Design-Builder” and “by or through the Design-Builder” and expressions of like import are synonymous and mean by the Design-Builder or by anyone employed by or through the Design-Builder, including the Design-Builder and all Subcontractors and their respective officers, agents, employees and workers;

(aa) all accounting and financial terms used herein are, unless otherwise indicated, to be interpreted and applied in accordance with GAAP, consistently applied;

(bb) if the time for doing an act falls or expires on a day that is not a Business Day, the time for doing such act will be extended to the next Business Day;

(cc) each provision of this Agreement will be valid and enforceable to the fullest extent permitted by law. If any provision of this Agreement is held to be invalid, unenforceable or illegal to any extent, such provision may be severed and such invalidity, unenforceability or illegality will not prejudice or affect the validity, enforceability and legality of the remaining provisions of this Agreement. If any such provision of this Agreement is held to be invalid, unenforceable or illegal, the parties will promptly endeavour in good faith to negotiate new provisions to eliminate such invalidity, unenforceability or illegality and to restore this Agreement as nearly as possible to its original intent and effect; and

(dd) each release, waiver of liability and indemnity in this Agreement expressed to be given in favour of a party is and will be interpreted as having been given in favour of and may be enforced by that party and, in the case of the Owner, by the Indemnified Parties.

1.4 All documents forming this Agreement are complementary, and what is required by any one will be as binding as if required by all.

1.5 If there is a conflict within the documents forming this Agreement:

(a) the provisions establishing the higher quality, manner or method of performing the Work, using the more stringent standards, will prevail, with the intent that the provisions which produce the higher quality with the higher levels of safety, reliability, durability, performance and service will prevail;

(b) the order of priority of documents from highest to lowest will be:

(i) the part of this Agreement from the first page to the page with the signatures of the persons executing this Agreement;

(ii) the schedules (including appendices, sub-schedules and attachments to the schedules), except Schedule 7 – Proposal Extracts, in the order in which they are listed in Section 1.2;

(iii) Schedule 7 - Proposal Extracts;

(c) specifications will govern over drawings;

(d) drawings of a larger scale will govern over those of a smaller scale of the same date;

(e) dimensions shown in drawings will govern over dimensions scaled from drawings; and

(f) later dated documents will govern over earlier dated documents of the same type.

PART B – PRICE, TIME, TERM

2. CONTRACT PRICE

2.1 The Owner will pay the Contract Price of $91,321,353 plus applicable GST to the Design-Builder for performance of the Work.

2.2 The Contract Price is the entire compensation to the Design-Builder for performance of the Work.

2.3 The Contract Price is subject to adjustments as provided in this Agreement.

2.4 The Owner will pay the Contract Price to the Design-Builder as provided in this Agreement.

3. CONTRACT TIME

3.1 The Design-Builder will commence the Work within 7 days after the Effective Date and will thereafter diligently perform the Work in accordance with this Agreement and achieve Substantial Completion on or before June 30, 2023 (the "**Target Substantial Completion Date**") and Total Completion on or before the date that is not more than 60 days after Substantial Completion.

3.2 The Design-Builder will perform the Work in compliance with the Time Schedule, as may be modified in accordance with the terms of this Agreement.

3.3 If the Design-Builder fails to achieve Substantial Completion on or before the Target Substantial Completion Date and the Owner has not extended the Time Schedule in accordance with this Agreement, the Design-Builder will pay to the Owner by way of liquidated damages and not as a penalty the sum of:

(a) per day for the first 31 days; and

(b) per day thereafter,

for each and every day after the Target Substantial Completion Date that Substantial Completion is not achieved (or if the Owner has extended the Time Schedule in accordance with this Agreement, such other date established for the Target Substantial Completion Date). The maximum aggregate amount of such liquidated damages will be of the Contract Price. If this Agreement is terminated, the reference in this Section 3.3 to the "**Contract Price**" will be deemed only for purposes of this Section 3.3 to be the amount to which the Design-Builder would have been entitled if the Design-Builder had properly performed and completed the Work and this Agreement had not been terminated. The liquidated damages will be the Owner's sole claim for damages against the Design-Builder for failure to achieve Substantial Completion by the Target Substantial Completion Date. The liquidated damages will not relieve the Design-Builder from its obligation to complete the Work or from any other duties, obligations or responsibilities of the Design-Builder under this Agreement, and will not limit the Owner's rights to terminate this Agreement for default of the Design-Builder under this Agreement.

3.4 The Owner and the Design-Builder agree that the amount in Section 3.3 represents a genuine pre-estimate of the damages and expenses that the Owner is likely to incur for such failure to meet the Target Substantial Completion Date for the Work and both parties expressly agree that such amount is not a penalty. The Owner may, in its discretion, either deduct the daily sums in respect of liquidated damages from the Performance Holdbacks or any amounts payable to the Design-Builder under this Agreement or may require payment thereof by the Design-Builder on demand.

4. TERM

4.1 With the exception of provisions that are expressly stated to survive the expiry of the Term, this Agreement is effective for the period commencing on the Effective Date and ending on the date (the "**End Date**") that (i) this Agreement is terminated in accordance with its terms or (ii) all of the following conditions are fulfilled:

(a) the Design-Builder and the Owner have performed all obligations required under this Agreement;

(b) the Total Completion Certificate has been issued in accordance with Section 43.12; and

(c) the Design-Builder has fulfilled all of its obligations pursuant to Section 37.

5. REPRESENTATIVES, OWNER'S CONSULTANT, PAYMENT CERTIFIER AND KEY INDIVIDUALS

5.1 Within 7 days after the Effective Date, the Owner will give written notice to the Design-Builder designating its representative for the purposes of this Agreement (the "**Owner's Representative**"). The Owner will give written notice to the Design-Builder of any change of the Owner's Representative. The Owner or the Owner Representative may by written notice delegate any or all of the functions of the Owner's Representative to any other person, including for a specified period of time in the absence of the Owner's Representative.

5.2 The representative of the Design-Builder for the purposes of this Agreement (the "**Design-Builder's Representative**") will be the person designated as such in Schedule 5 – Key Individuals, unless otherwise agreed by the Owner. The Design-Builder's Representative may by written notice delegate any or all of the functions of the Design-Builder's Representative to any other person, including for a specified period of time in the absence of the Design-Builder's Representative.

5.3 The Design-Builder's Representative will represent the Design-Builder at the Site and written instructions given to the Design-Builder's Representative by the Owner will be deemed to have been given to the Design-Builder.

5.4 The Owner will engage the Owner's Consultant to provide, without limitation, the following services, duties and responsibilities:

(a) interpreting, in the first instance, of the requirements of this Agreement and the making of findings as to the performance hereunder by both the Owner and the Design-Builder without showing partiality to either the Owner or the Design-Builder, and in no event incurring liability for the result of such interpretations or findings rendered in good faith in such capacity;

(b) interpreting and finding, in the first instance, of Disputes;

(c) assisting the Owner with advisory team services, including assisting with review of the Design;

(d) monitoring, reviewing and providing regular reporting to the Owner regarding the progress of the Work;

(e) rejecting Work which does not conform to the requirements of this Agreement;

(f) overseeing testing and inspections of the Construction, whether or not such Construction has been fabricated, installed, or completed;

(g) providing advice to the Owner and the Payment Certifier on the achievement of substantial performance under the *Builders Lien Act* (British Columbia), Substantial Completion and Total Completion;

(h) verification of the Design-Builder's applications for release of the Performance Holdbacks;

(i) reviewing any defects or deficiencies in the Work at Substantial Completion and during the Warranty Period and the issuance of appropriate instructions for the correction of same;

(j) any other work, services or responsibilities identified in this Agreement as being provided by the Owner's Consultant; and

(k) such other work that may be required by the Owner from time to time and that is acceptable to the Owner's Consultant.

The Owner reserves the right, on notice from the Owner to the Design-Builder, to perform or appoint an alternate advisor or consultant to perform the services, duties and responsibilities identified in Section 5.4, and similar or ancillary services, duties and responsibilities, and upon any such notice the applicable provisions of this Agreement will be deemed to refer to the Owner or such alternate advisor or consultant in place of the Owner's Consultant.

5.5 If the Owner's Consultant's engagement is terminated, the Owner will engage a new Owner's Consultant to provide the Owner's Consultant's services. The Owner will notify the Design-Builder in writing before appointing a new Owner's Consultant and the Owner will not appoint any person to be the new Owner's Consultant to whom the Design-Builder may reasonably object.

5.6 The Owner will engage the Payment Certifier to provide, without limitation, the following services, duties and responsibilities:

(a) determining of amounts owing to the Design-Builder based on the Payment Certifier's observations and evaluations of the Design-Builder's applications for payment;

(b) determining the dates of substantial performance under the *Builders Lien Act* (British Columbia) and the issuing of certificates for same;

(c) in cooperation with the Owner and the Owner's Consultant, determining the dates for Substantial Completion and Total Completion and the issuing of certificates for same;

(d) any other work, services or responsibilities identified in this Agreement as being provided by the Payment Certifier; and

(e) such other work that may be required by the Owner from time to time and that is acceptable to the Payment Certifier.

The Owner reserves the right, on notice from the Owner to the Design-Builder, to perform or appoint an alternate advisor or consultant to perform the services, duties and responsibilities identified in Section 5.6, and similar or ancillary services, duties and responsibilities, and upon any such notice the applicable provisions of this Agreement will be deemed to refer to the Owner or such alternate advisor or consultant in place of the Payment Certifier.

5.7 If the Payment Certifier's engagement is terminated, the Owner will engage a new Payment Certifier to provide the Payment Certifier services. The Owner will notify the Design-Builder in writing before appointing a new Payment Certifier and the Owner will not appoint any person to be the new Payment Certifier to whom the Design-Builder may reasonably object.

5.8 Attached as Schedule 5 - Key Individuals is a list of Key Individuals that the Design-Builder will utilize in undertaking the Design and Construction as described in that Schedule. Unless agreed by the Owner, no individual will hold more than one position set out in Schedule 5 - Key Individuals.

5.9 With respect to each of the Key Individuals:

(a) the Design-Builder will use all reasonable efforts to retain the Key Individuals to perform the roles described in Schedule 5 - Key Individuals; and

(b) if for any reason a Key Individual resigns or is otherwise unavailable to perform the roles described in Schedule 5 - Key Individuals then the Design-Builder will use all reasonable efforts to retain a replacement with similar expertise and experience to the unavailable Key Individual satisfactory to the Owner acting reasonably, and the Design-Builder will not replace such Key Individual without the Owner's consent, acting reasonably.

5.10 Within 10 days of the Design-Builder having knowledge that a Key Individual is or will be unavailable, the Design-Builder will:

(a) notify the Owner; and

(b) immediately commence the process to retain a replacement prior to the unavailability of such Key Individual or promptly thereafter and will replace the Key Individual no later than 20 Business Days after the unavailability of such Key Individual.

5.11 If either the Owner or the Design-Builder reasonably considers that a replacement cannot reasonably be retained within such 20 Business Days, the Design-Builder will deliver to the Owner a reasonable program (set out, if appropriate, in stages) for retaining the replacement. The program will specify in reasonable detail the manner in, and the latest date, by which the replacement will be retained.

5.12 The Owner will have 10 Business Days from receipt of the program within which to notify the Design-Builder that the Owner, acting reasonably, does not accept the program, failing which the Owner will be deemed to have accepted the program. If the Owner notifies the Design-Builder that it does not accept the program as being reasonable, the parties will use all reasonable efforts within the following five Business Days to agree to any necessary amendments to the program put forward. In the absence of an agreement within such five Business Days, the question of whether the program (as it may have been amended by agreement) will result in the retainer of a replacement in a reasonable manner and within a reasonable time period (and, if not, what would be a reasonable program) may be referred by either party for resolution in accordance with Part K - Dispute Resolution.

5.13 The Design-Builder acknowledges that the success of the Project to both the Design-Builder and the Owner is dependent on the retention of the Key Individuals and if any of the Key Individuals are not available and are not replaced as required by this Agreement, the Owner will not be obtaining the Design and Construction at the quality and level assumed to be included in the payments to be made to the Design-Builder hereunder and that in addition the Owner may incur costs and expenses.

5.14 If either (i) the position of any Key Individual remains unfilled for more than 20 Business Days after the applicable individual Key Individual ceased to hold the position or ceased to perform the functions of that position, or (ii) the Owner has accepted a program under Section 5.12 and the Design-Builder at any time fails to comply with any part of the program:

(a) the Design-Builder will pay the Owner's reasonable internal administrative and personnel costs and all reasonable out-of-pocket costs related to any measures the Owner considers are reasonably incurred in relation to the position being unfilled, including the costs to ensure that Design-Builder meets its requirements for Design and Construction and for the Owner to review and consider any replacement under this Section 5; and

(b) the Owner at its election may deem the position of the Key Individual to be a Change (other than the requirements to comply with this Section 5) and for the period of time that the Key Individual position has remained unfilled the Owner will be credited with the amount of the cost (wages, benefits, fees and other costs) that would have been incurred by the Design-Builder and Subcontractors in respect of the Key Individual plus a markup as set out in Section 48.2(b).

PART C - THE WORK

6. GENERAL

6.1 The Design-Builder will perform the Work in accordance with the requirements of this Agreement, including Schedule 1 – Statement of Requirements.

6.2 The Design-Builder will perform and provide all professional design services, construction administration and construction work and all labour, services, products, materials, tools, water, heat, light, power, transportation, equipment, machinery and other facilities and services and everything else necessary for the performance of the Work.

7. TIME SCHEDULE

7.1 The Design-Builder will submit for review by the Owner, by no later than 14 days after the Effective Date and, in any event, before the Owner is required to make the first payment, a Time Schedule consistent with the form of Time Schedule included in the Proposal Extracts.

7.2 The Design-Builder will ensure that the Time Schedule will be consistent with and meet the Target Substantial Completion Date, the date required for Total Completion and all other applicable requirements of this Agreement including Schedule 1 - Statement of Requirements.

7.3 The Design-Builder will submit for review by the Owner an updated Time Schedule at intervals of 1 month, reflecting progress to date and including a comparison to the previously submitted Time Schedule, the reasons for any changes from the previous Time Schedule and a forecast to achieving Substantial Completion and Total Completion.

7.4 If at any time the actual progress of the Work does not materially conform with the Time Schedule, the Design-Builder will:

(a) submit to the Owner a report identifying the reasons for such non-conformity; and

(b) submit to the Owner a revised Time Schedule that meets all applicable requirements of this Agreement and provides for the Work to be pursued diligently to Substantial Completion and Total Completion.

8. CONTROL AND SUPERVISION OF THE WORK

8.1 The Design-Builder will effectively direct and supervise the Work using its best skill and attention. The Design-Builder will be solely liable and responsible for:

(a) all design and all construction means, methods, techniques, sequences and procedures with respect to the Work; and

(b) coordinating all parts of the Work under this Agreement and for coordinating the Work with work of Subcontractors and, in accordance with Section 21.2, with work of Other Contractors,

in accordance with generally accepted management and supervisory practices in British Columbia.

8.2 The Design-Builder will have the sole responsibility for the design, erection, operation, maintenance and removal of temporary structures and other temporary facilities and the design and execution of construction methods required in their use. The Design-Builder will engage and pay for Professional Engineers and Architects to perform these functions where required by Law, and in all cases where such temporary facilities and their method of construction are of such a nature that the education, training and qualifications of the Architect or Professional Engineer are required to produce safe and satisfactory results.

8.3 The Design-Builder will execute the Work in a continuous and diligent manner, and perform all its obligations in conformance with this Agreement, including the Project Management Plan and the Time Schedule.

8.4 Unless otherwise stated in this Agreement, the Design-Builder will perform the Work at the times, in the order of procedure and in the manner and method that the Design-Builder considers appropriate provided such Work is in conformance with this Agreement, including the Project Management Plan, Phasing Plan, Work Plan, Site Plan and the Time Schedule.

8.5 The Design-Builder will employ a competent construction manager, and necessary assistants, at the Site at all times during the progress of the Work.

8.6 The Design-Builder will employ or cause the Subcontractors to employ a sufficient number of sufficiently skilled workers to perform the Construction in compliance with this Agreement.

8.7 The Design-Builder will at all times maintain good order and discipline among its employees engaged on the Work.

8.8 Before commencing the Work, the Design-Builder will:

(a) purchase and deliver the Bonds as set out in Section 59 to the Owner; and

(b) file with the Owner certificates of all insurance policies and necessary endorsements to comply with the Insurance Conditions.

8.9 The Design-Builder will provide to the Owner with notice when the Design-Builder reasonably expects to achieve the Site Occupation Date within the next 30 days. At any time upon request by the Owner, the Design-Builder will provide the Design-Builder's current anticipated Site Occupation Date and will provide such other information reasonably required by the Owner to assist the Owner to plan for the relocation of the Existing School's programs and activities.

8.10 The Design-Builder will not perform any Construction on the Site prior to the Site Occupation Date and will not commence any Construction until the Design-Builder has submitted a Design for that portion of the Work to be constructed that is in conformance with this Agreement, submitted to the Owner under the Review Procedure and that the Design-Builder is entitled to proceed with under the Review Procedure.

8.11 If agreed to in writing by the Owner, the Design-Builder may perform necessary limited investigative and preparatory activities on the Site prior to the Site Occupation Date.

8.12 The Design-Builder will comply with the provisions of Schedule 8 - Apprenticeship Policy.

9. QUALITY MANAGEMENT

9.1 The Design-Builder is solely responsible for the quality of the Work and will diligently implement its Quality Management Plan.

9.2 The Design-Builder will establish, implement and submit for the review by the Owner, by no later than 30 days after the Effective Date, a Quality Management Plan consistent with the form of Quality Management Plan included in the Proposal Extracts and the requirements of this Section 9. The Design-Builder will perform the Work in accordance with, and meet the requirements of, the Quality Management Plan.

9.3 The Quality Management Plan will:

(a) meet all applicable requirements of this Agreement;

(b) outline the procedures to be implemented to ensure robust and thorough quality control and quality assurance by the Design-Builder and its Subcontractors;

(c) clearly indicate the processes, testing, certification and auditing that will be performed to verify all parts of the Work comply with this Agreement;

(d) clearly indicate the timing of the elements of the Quality Management Plan and the documentation to demonstrate compliance that will be obtained by the Design-Builder and its Subcontractors and provided to the Owner;

(e) include all processes, testing, certification, auditing and documentation reasonably required by the Owner's Consultant; and

(f) ensure that the Work will meet the requirements of this Agreement.

9.4 The Design-Builder will not commence any Construction until:

(a) the quality control and quality assurance procedures applicable to that part of the Work have been developed and included in the Quality Management Plan and the Design-Builder is entitled to proceed with the Quality Management Plan in accordance with the Review Procedure; and

(b) such quality control and quality assurance procedures are fully implemented by the Design-Builder.

9.5 The Owner may at any time audit the Quality Management Plan and its implementation and may, at the Owner's expense, carry out independent quality control testing at any time.

9.6 Nothing in this Section 9 and no review, audit, inspection, acceptance, comment, approval, action or inaction by the Owner, the Owner's Representative, the Owner's Consultant or any person on behalf of the Owner or by or on behalf of any governmental authority will derogate from or relieve the Design-Builder from its obligations under this Agreement including sole responsibility for the quality of the Work, the Quality Management Plan and implementation of the Quality Management Plan.

9.7 The Owner, the Owner's Representative, the Owner's Consultant and other persons designated by the Owner will, subject to the terms of this Agreement relating to health and safety, have access to the Work at all times at the Site and wherever the Work is in preparation or progress and the Design-Builder will provide reasonable facilities for such access.

9.8 If any of the Work requires tests, inspections or approvals by this Agreement, or by the written instructions of the Owner or the Owner's Consultant or by applicable Laws, the Design-Builder will give the Owner reasonable notice of when such Work is ready for review and inspection. The Design-Builder will arrange for and will give the Owner reasonable notice of the date and time of inspections by any governmental authorities.

9.9 The Design-Builder will furnish promptly to the Owner, on request, a copy of certificates and inspection reports relating to the Work.

9.10 If the Design-Builder covers, or permits to be covered, Work that has been designated for tests, inspections or approvals before such tests, inspections or approvals are made, given or completed, the Design-Builder will, if so directed, uncover such Work, have the inspections or tests satisfactorily completed, and make good the covering work at the Design-Builder's expense.

9.11 Subject to Section 9.10, the Owner may order any portion or portions of the Construction to be examined to confirm that such Construction is in accordance with the requirements of this Agreement. If the Construction is not in accordance with the requirements of this Agreement, the Design-Builder will correct the Construction and pay the cost of examination and correction. If the Construction is in accordance with the requirements of this Agreement, the Owner will pay all costs incurred by the Design-Builder as a result of such examination and the restoration of the Construction.

9.12 If the results of any testing or other aspect of the Quality Management Plan or implementation of the Quality Management Plan disclose that any part of the Work is incomplete or defective in any way, the Design-Builder will immediately complete that part of the Work or correct the defect at its own expense.

9.13 If the Owner's Consultant, the Payment Certifier or other representatives of the Owner makes more than one review of any aspect of the Work as a result of such Work being incomplete or defective or reviews more than one test, inspection or approval in respect of any aspect of the Work as a result of such Work being incomplete or defective, the Design-Builder will bear the costs and expenses of the Owner, the Owner's Consultant, the Payment Certifier and other representative.

9.14 Prior to Total Completion, the Design-Builder will deliver to the Owner all tests and results taken and generated by the implementation of the Quality Management Plan.

9.15 The Design-Builder will permit access to the Site and to the Design and the Construction to persons designated by the Owner including persons representing other governmental authorities.

10. LEED GOLD CERTIFICATION

10.1 The Design-Builder will obtain LEED Gold Certification of the Facility in accordance with the following:

(a) The Owner will register, at its own cost, the Facility with the USGBC;

(b) The Design-Builder will, subject to this Section 10, achieve all necessary prerequisites, credits and points under the LEED Rating System required to achieve the LEED Gold Certification and may in its discretion determine which of the credits and points to pursue, provided that the Owner will not accept any credit that requires action or obligation on the part of the Owner unless the Design-Builder has received prior written consent from the Owner, which consent may be withheld at the Owner's sole discretion.

(c) If at any time after the Effective Date the requirements to achieve LEED Gold Certification under the LEED Rating System change and the Design-Builder is required to comply with such change in order to achieve LEED Gold Certification for the Facility, then the Design-Builder will forthwith notify the Owner of such change and such change will be a Change.

(d) Within 6 weeks of the Effective Date, the Design-Builder shall submit an updated version of the LEED scorecard and also indicate the design team member with primary responsibility for achieving each credit. In addition, this submission shall also include a preliminary EA credit 5 Measurement and Verification points list outlining the expected monitoring points and how they will be grouped together to provide the energy end use breakdown.

(e) Prior to the commencement of Construction of the Facility, the Design-Builder shall submit for review a complete documentation package for all pre-design or detailed design credits being pursued.

(f) Within 6 months following the commencement of Construction, the Design-Builder shall submit documentation to date for all construction stage credits being pursued.

(g) The Design-Builder will compile and submit the required documents for LEED Gold Certification.

(h) If for any reason the Design-Builder fails to obtain LEED Gold Certification for the Facility within 36 months of the Substantial Completion Date, then:

(i) the Owner may apply the amount of the LEED Holdback to its own account as liquidated damages; and

(ii) the Design-Builder will have no claim against, nor right to receive, the LEED Holdback even if LEED Gold Certification of the Facility is subsequently achieved.

(i) Upon payment of the LEED Holdback under this Section 10.1(h) the Design-Builder will have no further obligations in respect of obtaining LEED Gold Certification, except to provide the Owner with such information and administrative assistance as the Owner may reasonably require in relation to obtaining LEED Gold Certification, and for greater certainty the failure to obtain LEED Gold Certification will not be a default by the Design-Builder under this Agreement.

(j) The Owner and the Design-Builder expressly agree that the amounts payable from the Design-Builder in this Section 10.1 are liquidated damages that represent a genuine pre-estimate of the damages and expenses that the Owner is likely to incur for such failure to achieve LEED Gold Certification and both parties expressly agree that such amounts are not a penalty.

10.2 As a condition of Substantial Completion, the Design-Builder will deliver to the Owner

(a) a LEED project checklist, generally in accordance with USGBC requirements, together with a written confirmation that, in the Design-Builder's judgment LEED Gold Certification will be achieved for the Facility as required by Section 10;

(b) a written opinion from a LEED accredited professional supporting the confirmation described in Section 10.2(a) above; and

(c) an electronic copy of the LEED Gold Certification submissions that have been made to the USGBC related to the Facility.

11. PROJECT CREDITS

11.1 The Owner will be entitled to any and all Project Credits related to the Work, the Facility and its operation.

11.2 The Design-Builder will, on behalf of the Owner, apply to BC Hydro, FortisBC, USGBC, and any other applicable incentive programs ("**Credit Provider**") and take all reasonable steps to obtain for the Owner the maximum benefits (funding, rebates, incentives and cost savings) offered by each Credit Provider under such program(s).

11.3 Without limitation, the Design-Builder will:

(a) meet with Credit Providers at an early stage of the design of the Project;

(b) carry out any required studies and modelling;

(c) collaborate with each Credit Provider to identify potential improvements to the Facility design and methods of performing the Work that may achieve greater Project Credits; and

(d) use all commercially reasonable efforts to maximize available Project Credits through the Design and Construction of the Facility (to the extent possible while maintaining consistency with the Statement of Requirements).

12. PRE-CONSTRUCTION SURVEY

12.1 The Design-Builder will:

(a) prior to the start of any Construction, conduct a pre-Construction survey of existing structures, buildings, roadways, services, infrastructure and adjacent properties, in a form and detail satisfactory to the Owner, acting reasonably, which will without limitation include field observations and photographs of existing conditions, with spot elevations by a British Columbia Land Surveyor (BCLS) registered surveyor at locations that will be accessible throughout and following Construction for ongoing settlement monitoring, and deliver a copy of the pre-Construction survey report to the Owner; and

(b) re-survey the spot elevations at regular intervals throughout Construction and at 6 months following Substantial Completion to determine ongoing long-term settlement effects, and deliver monitoring surveys to the Owner in a form and detail satisfactory to the Owner, acting reasonably.

12.2 The Design-Builder will protect the Work, the Site and property adjacent to the Site from settlement, will be responsible for all settlement caused by the Work by the Design-Builder and the Subcontractors and the Facility from and after the Effective Date and will make good all damage to the Work, the Site and property adjacent to the Site at its own expense or pay all costs incurred by the Owner or others in making good such damage. Nothing in this Section 12.2 limits the responsibility of the Design-Builder to take into account in the Design and Construction possible post-Warranty Period settlement and to take measures to minimize such settlement.

13. EQUIPMENT AND FURNISHINGS

13.1 Without limiting the requirements of the Statement of Requirements in respect of equipment and furnishings, the Design-Builder will complete the Design and Construction to integrate and accommodate all equipment and furnishings in the Facility as identified in the Statement of Requirements, including all required electrical and plumbing connections, structural support, seismic restraints and space for efficient access, all to the tolerances and specifications as may be specified and required by the manufacturers or vendors of the equipment (which may be of a higher standard than specified in this Agreement). The Design-Builder will include equipment and furnishings identified in the Statement of Requirements as part of the development of Design under this Agreement.

14. REVIEW PROCEDURE

14.1 The Review Procedure will apply to all Submittals and the parties will comply with the requirements of that Schedule.

15. GENERAL DESIGN REQUIREMENTS

15.1 The Design-Builder is responsible for the means, methods, techniques, sequences and procedures necessary to properly complete the Design in conformance with this Agreement, including the Project Management Plan and the Time Schedule.

15.2 The Design-Builder will:

(a) ensure that the Work, including the Design, is fully compliant with all requirements of this Agreement (including the Statement of Requirements) and all applicable Laws; and

(b) perform and complete the Design and the Work so as to provide the completed Project that is fit for the intended uses as described in the Statement of Requirements.

15.3 The Design-Builder will:

(a) cause all portions and aspects of the Drawings and Specifications to be prepared under the direction of, and to be sealed under the professional seal of, the Design-Builder's Consultant;

(b) cause the Design-Builder's Consultant to confirm to the Owner, under his or her professional seal (if applicable), that in the opinion of the Design-Builder's Consultant:

(i) the Drawings and Specifications implement and otherwise conform to the Statement of Requirements;

(ii) the Drawings and Specifications implement and otherwise conform to the Proposal Extracts;

(iii) the Drawings and Specifications have been prepared in accordance with, and substantially comply with, all Standards; and

(iv) the Design-Builder's Consultant has carried out the general reviews of the progress of the Construction, to the extent necessary, in order to determine to the Design-Builder's Consultant's satisfaction that the Construction is performed in general conformity with the requirements of the Agreement (including the Statement of Requirements), the Drawings and Specifications, Standards and applicable Laws; and

(c) provide the Owner and all applicable governmental authorities with all letters of professional assurance as required pursuant to applicable Laws.

15.4 The Design-Builder will not construct any part of the Work that is not based on the most recent Drawings and Specifications or that does not meet the Statement of Requirements and other requirements of this Agreement. To the extent that the Drawings and Specifications conflict with, modify or deviate from the Statement of Requirements and other requirements of this Agreement, the Design-Builder will revise the Drawings and Specifications and submit them to the Owner under the Review Procedure.

15.5 The Design-Builder will make, or cause the Design-Builder's Consultant to make, any revisions to the Drawings or Specifications as are necessary from time to time due to Changes and, for clarity, the Design-Builder will comply with Section 15.3 with respect to any such revisions.

15.6 Nothing in this Section 15, or otherwise in or under this Agreement, makes the Owner, the Owner's Representative, the Owner's Consultant, the Payment Certifier or any other person on behalf of the Owner responsible for the Design of the Project, including compliance of the Drawings and Specifications with the Statement of Requirements and all Standards, and the Design-Builder will, notwithstanding any review or acceptance under the Review Procedure or this Section 15 or other act of the Owner, remain solely liable and responsible for compliance of the Drawings and Specifications with the Statement of Requirements and all Standards.

15.7 Without limiting any of the obligations of the Design-Builder under this Agreement, the duties and responsibilities of the Design-Builder with respect to the Design include:

(a) review of the documents, reports, drawings, Statement of Requirements and other information provided by the Owner and reporting promptly to the Owner any error, inconsistency or omission the Design-Builder may discover;

(b) preparation of a Design that meets the Statement of Requirements, all Standards, all applicable Laws and all terms of this Agreement;

(c) the coordination required to integrate all parts of the Design in the Work;

(d) preparation of all reports, documents, information, schemes and presentation materials as required by this Agreement;

(e) inspecting the progress of the Construction in order to determine that the Work is in compliance with the requirements of the Design, Specifications, all Standards and all terms of this Agreement;

(f) liaising with the Owner and local authorities having jurisdiction as required during the Design and Construction and providing copies of all correspondence with such local authorities to the Owner; and

(g) providing all required assurances to local authorities having jurisdiction respecting substantial conformance of the Design with all Standards and as may be required for the issuance of or compliance with any permits, licenses or approvals.

15.8 The Design-Builder will ensure that the Design-Builder's Consultant and all other Architects, Professional Engineers and other professionals performing professional services related to the Design and engaged directly or indirectly by the Design-Builder fulfill their duties and responsibilities to the standard of diligence, skill and care that such persons would customarily provide in accordance with their professional and legal obligations in similar circumstances and in the same general geographic location as the Site. Any failure by any of the Design-Builder's Consultants or other Architects, Professional Engineers or professionals performing professional services in relation to the Design will not relieve the Design-Builder of any responsibility for ensuring that the Work is carried out in conformance with this Agreement including the Statement of Requirements, the Design and all Standards.

15.9 If the Design-Builder's Consultant's engagement is terminated, the Design-Builder will engage a new Design-Builder's Consultant to provide the Design. The Design-Builder will notify the Owner in writing before appointing or re-appointing the Design-Builder's Consultant, and the Design-Builder will not appoint any Design-Builder's Consultant to whom the Owner may reasonably object.

16. DESIGN PROCESS

16.1 Unless otherwise agreed by the Owner, the Design-Builder will submit Drawings and Specifications and supporting information to the Owner for review under the Review Procedure in accordance with the Statement of Requirements at the following Design stages:

(a) 30%;

(b) 60%;

(c) 90%; and

(d) 100%.

16.2 Within 30 days after the Effective Date, the Design-Builder will deliver to the Owner the 30% Drawings and Specifications for the Project.

16.3 After review of the Submittals at the various stages by the Owner, the Design-Builder will finalize and complete the "issued for construction" Drawings and Specifications. The Design-Builder will provide 3 copies of the final "issued for construction" Drawings and Specifications, and any revisions, to the Owner together with a certificate from the Design-Builder's Consultant that the "issued for construction" Drawings and Specifications conform to the requirements of this Agreement and Submittals from the pre-tender Drawings and Specifications stage (including to address comments received from the Owner). The Design-Builder will provide the Drawings and Specifications on USB in the format outlined in the Schedule 2 – Review Procedure and acceptable to the Owner, acting reasonably.

16.4 Without limiting the generality of Section 16.1, each of the Submittals in this Section 16 must be formatted in a manner as described in the Statement of Requirements and Schedule 2 – Review

Procedure, and contain detail that is satisfactory to the Owner. The Submittals must have clearly identified sections for:

(a) architectural design;

(b) site development and landscaping;

(c) civil design;

(d) structural design;

(e) mechanical design; and

(f) electrical design.

16.5 Each of the Submittals in this Section 16 must contain:

(a) 2 sets of Drawings at 50% scale (11x17 acceptable) and 2 sets of Drawings at full scale;

(b) 3 sets of Specifications;

(c) 3 sets of supporting material (such as: code analysis, energy cost models, acoustic design reports, correspondence, etc.);

(d) relevant design calculations and material specifications;

(e) reports showing the Design decision process, criteria and assumptions used to develop the Design;

(f) at 60% stage, interior perspectives;

(g) any other information the Design-Builder determines will assist the Owner (such as: models or three-dimensional renderings);

(h) a certificate from the Design-Builder's Consultant that the Drawings and Specifications conform to the requirements of this Agreement; and

(i) any other information set out as a requirement in the Statement of Requirements or that the Owner may reasonably request.

16.6 The Design-Builder will comply with any requirements set out in the Agreement, including the Statement of Requirements and Schedule 2 - Review Procedure, in relation to the stages and process for Design, including with respect to meetings, presentations, mock-ups and user groups.

16.7 Unless otherwise required by the Owner, the Design-Builder will provide and use, and make available to the Owner and representatives of the Owner, a secure and confidential internet-based system for the storage and exchange of Design documentation in electronic format acceptable to the Owner.

17. OWNERSHIP OF DOCUMENTS

17.1 The Design-Builder acknowledges and agrees that this Agreement contains intellectual property that is protected by copyright and that this intellectual property is intended to be used solely for the purposes of the Project. The Design-Builder will obtain prior written permission and will

require the Design-Builder's Consultant and any other Subcontractors to obtain prior written permission for any other use.

17.2 Copyright for the Design and Drawings belongs to the Design-Builder, the Design-Builder's Consultant or other consultants who prepared them.

17.3 Plans, sketches, Drawings, graphic representations and Specifications, including computer generated designs, when prepared by the Design-Builder's Consultant or other consultants are instruments of their service and will remain their property whether the construction for which they are made is executed or not.

17.4 Submission or distribution of the Design-Builder's Consultants' or other consultants' plans, sketches, Drawings, graphic representations and Specifications to meet official regulatory requirements or for other purposes in connection with the Work is not to be construed as publication in derogation of their reserved rights.

17.5 The Owner may retain copies, including reproducible copies, of all plans, sketches, Drawings, graphic representations and Specifications and other material including the Record Drawings. The Design-Builder hereby grants to the Owner a non-exclusive, royalty-free, fully paid, world-wide, perpetual and irrevocable licence to use the Design and any and all such material for any purpose related to the use and ownership of the Facility and the Land (including any renovations, additions or alterations to the Facility), for completion of any Work in the event of termination of this Agreement and for reference purposes in connection with other operations, projects and facilities of the Owner. Such licence may be sublicensed, assigned, at the discretion of the Owner, to any third party who has or may acquire an interest or obligation related to the Facility, including for any facilities maintenance, life cycle repair/replacement or other services to the Owner or others in relation to the Facility. The Design-Builder at the Owner's request, and prior to any payment after such request is made, will deliver to the Owner a consent and acknowledgement signed by the Design-Builder's Consultant confirming such licence.

17.6 Models and renderings furnished by the Design-Builder are the property of the Owner.

18. ERRORS IN DESIGN

18.1 The Design-Builder is responsible for the Design, including all errors, omissions or deficiencies in the Design.

18.2 The Design-Builder will give written notice to the Owner immediately upon becoming aware of any error, omission or deficiency in the Design.

18.3 The Design-Builder will remedy at its own cost any error, omission or deficiency identified in the Design, including any resulting error, omission or deficiency in the Design that results in defects or deficiencies in any part of the Construction that has been commenced or completed. The Design-Builder will ensure that such remediation will conform to the requirements of this Agreement.

19. LABOUR AND PRODUCTS

19.1 Unless otherwise expressly provided in this Agreement, the Design-Builder will provide and pay for all labour, products, materials, tools, equipment, machinery, water, heat, light, power, transportation and all other facilities, things and services (including services for Design) necessary for the performance of the Work in accordance with this Agreement.

19.2 All products, materials, equipment and machinery intended to be incorporated into the Work will be new unless otherwise expressly specified in this Agreement.

20. SUBCONTRACTS

20.1 The Design-Builder will preserve and protect the rights of the Owner under this Agreement with respect to any Work to be performed by a Subcontractor, so that the subcontracting does not prejudice the Owner's rights under this Agreement.

20.2 The Design-Builder will be responsible to the Owner for the performance of all Subcontractors and will require the Subcontractors to perform their work in accordance with the terms and conditions of this Agreement.

20.3 The Design-Builder will be as fully responsible to the Owner for acts and omissions of Subcontractors and of persons directly or indirectly employed by them as for the acts and omissions of persons directly employed by the Design-Builder.

20.4 Nothing contained in this Agreement will create any contractual relationship between the Owner and any Subcontractors or their officers, agents, employees or workers.

20.5 The Design-Builder will require every Subcontractor to observe the terms of this Agreement so far as they apply to that portion of the Work to be performed directly or indirectly by that Subcontractor. The Design-Builder will require that the terms of this Agreement that are applicable to the portion of the Work to be performed by a Subcontractor will form part of that Subcontract.

20.6 The Design-Builder will require that every Subcontract for designers and Subcontractors require such designers and Subcontractors, where requested by either the Owner or the Design-Builder, to attend any Dispute resolution process including discussions, negotiations, mediation or arbitration between the Design-Builder and the Owner; provide frank, candid and timely disclosure of relevant information and documentation; and, bona fide negotiations to resolve such Disputes.

21. OTHER CONTRACTORS

21.1 The Owner reserves the right to enter into separate contracts with Other Contractors in relation to the Project or to perform work itself. The Design-Builder will cooperate with and coordinate the Work with all concurrent construction activities by the Owner or Other Contractors on the Site or adjacent to the Site.

21.2 The Design-Builder will:

(a) coordinate the Work with that of Other Contractors and connect the Work with the work of Other Contractors as applicable; and

(b) ensure that performance of the Work is carried out in accordance with the Time Schedule so that Other Contractors are not delayed in their work.

21.3 The Design-Builder will promptly report to the Owner any apparent deficiencies in Other Contractors' work that could affect the Work as soon as they come to the Design-Builder's attention, and will confirm such report in writing promptly.

21.4 Where a Change is required as a result of the coordination and connection of the work of Other Contractors or the Owner with the Work, the Changes will only be made as provided in Section 46.

21.5 The Owner will require Other Contractors to coordinate and schedule their construction activities at the Site in accordance with the reasonable instructions of the Design-Builder, acting as prime

contractor, related to health and construction safety at the Site and compliance with the *Workers Compensation Act* (British Columbia).

21.6 The Design-Builder acknowledges that other persons working at the Site may be union or non-union and that the Owner wishes to ensure that labour peace is maintained. The Design-Builder will comply with all requirements of the Owner in respect of labour relations and the Design-Builder will take all reasonable precautions to avoid labour disruptions caused by, or contributed to by the Design-Builder, its Subcontractors or any persons performing the Work. The Design-Builder will bear the sole cost and expense of preventing, avoiding or removing any matter or events giving rise to such a labour disruption.

21.7 The Owner will assure, where possible, that Other Contractors are bound to equivalent terms as those found in this Section 21.

21.8 Claims, disputes, and other matters in question between the Design-Builder and Other Contractors will be dealt with as provided in Section 62 provided the Other Contractors have reciprocal obligations. The Design-Builder will be deemed to have consented to arbitration of any dispute with any Other Contractor whose contract with the Owner contains a similar requirement to Section 62.

22. ACCESS TO AND USE OF SITE

22.1 Subject to the Site Plan, Project Management Plan and Work Plan and any limitations in this Agreement, the Owner grants to the Design-Builder a licence to enter and be upon the Site from the Site Occupation Date until Substantial Completion, to perform the Work that is required to be performed on the Site.

22.2 After Substantial Completion, the Owner will provide access to the Facility and the Site as reasonably required for completion of the Work and rectification of deficiencies including warranty deficiencies, taking into account the Owner's use and occupancy of the Facility and the Site.

22.3 After Substantial Completion, the Design-Builder will:

(a) coordinate with the Owner to ensure timely completion of the Work and rectification of deficiencies including warranty deficiencies;

(b) comply with the Owner's requirements as set out in Section 31 with respect to dust, noise and vibration;

(c) minimize disruption to the Owner's use and occupancy of the Facility and will comply with all directions of the Owner with respect to timing, security and access for the rectification of deficiencies including warranty deficiencies; and

(d) comply with the security requirements of the Owner.

22.4 The Design-Builder will:

(a) limit its activities to the areas within the Site which are identified in the Site Plan, Project Management Plan and Work Plan as required to perform the particular aspect of Work, unless the Design-Builder obtains permission to occupy or use other lands;

(b) not access any areas of the Site or adjacent properties, including airspace, which it is not permitted to access under the Site Plan, Project Management Plan or Work Plan, without the prior written permission of the Owner; and

(c) obtain any construction easements and permits that may be required for construction of the Project. When requested to do so by the Design-Builder, the Owner may at its discretion provide reasonable assistance to the Design-Builder in obtaining such construction easements and permits required for the construction of the Project but, in no circumstance will the Owner be required to incur any costs or make any payments.

22.5 The Design-Builder will:

(a) not remove or disturb trees or other vegetation for purposes of the Work, including for the purpose of providing a lay down area unless expressly permitted to do so under this Agreement and in accordance with any applicable Laws and the Statement of Requirements. The Design-Builder will obtain any required tree cutting permits; and

(b) rehabilitate all construction lay down areas to a standard not less than that observed for pre-existing conditions before Site Occupation Date and recorded in the pre-condition survey as described in Section 12.1.

22.6 The Design-Builder acknowledges that parking is limited around the Site. The Design-Builder, the Subcontractors and their respective workers may park within the Site as of the Site Occupation Date. The Design-Builder will use reasonable efforts to provide alternate transportation solutions for workers if necessary.

23. PROJECT MANAGEMENT

23.1 The Design-Builder will carry out the Construction in accordance with the Project Management Plan which will include, among other things:

(a) all Site preparation;

(b) Construction of the Facility, including the requirements and timing for construction and commissioning (including all systems and equipment);

(c) restricting Construction to the Facility until it is completed by the Design-Builder and made available to the Owner for occupancy;

(d) not carrying out any Construction on the remainder of the Site until the Facility is completed by the Design-Builder and made available to the Owner for occupancy;

(e) demolition (if any);

(f) Site landscaping (if any);

(g) parking, access and traffic flows, including maintaining adequate vehicle, delivery and pedestrian access; and

(h) compliance with all requirements of this Agreement,

and the Design-Builder will submit the Project Management Plan to the Owner within 30 days after the Effective Date and will not proceed until the Project Management Plan has received the notation "Reviewed" under Schedule 2 - Review Procedure. If the Design-Builder proposes revisions to the Project Management Plan, the Design-Builder will submit the proposed revised Project Management Plan to the Owner and will not proceed with revised Project Management Plan until it has received the notation "Reviewed" under Schedule 2 - Review Procedure.

23.2 The Design-Builder will:

(a) comply with the reviewed Project Management Plan;

(b) construct the Facility within the area of the Site indicated in the Site Plan;

(c) install fencing around the perimeter of the area in which it is performing the Work that:

(i) on the south perimeter, is appropriately sized to protect against objects entering the area from the ongoing use of sports fields on elevated land in close proximity to the Site; and

(ii) on all other perimeters, is at least six feet high,

and will install such hoarding and lighting as may be required by the Owner, including any hoarding required to protect the public and separate the area of the Work from the other portions of the Site;

(d) perform all Construction activities within the areas of the Site provided in the Site Plan and Project Management Plan, except as approved by the Owner for any work required in other areas of the Site;

(e) perform all Construction activities without blocking or disrupting vehicle, delivery or pedestrian access, except as may be permitted pursuant to the Project Management Plan;

(f) cause the Design-Builder's personnel, Construction workers, Subcontractors and suppliers to enter or exit the Site only at the access routes indicated on the Site Plan and Project Management Plan, unless otherwise approved by the Owner;

(g) prevent the Design-Builder's personnel, Construction workers, Subcontractors and suppliers from entering any parts of the Lands, including the Existing School, other than the Site except pursuant to an approved Work Plan;

(h) not use any explosives without the Owner's consent;

(i) take reasonable steps to ensure that Construction workers or suppliers do not smoke on any portion of the Lands;

(j) provide a 24-hour hotline (and post the phone number in a prominent location on the Site) for:

(i) Owner staff to notify the Design-Builder of any Construction related emergencies; and

(ii) neighbours and passers-by to contact the Design-Builder,

and the Design-Builder will respond to any phone calls made on the hotline within 1 hour of receipt;

(k) provide the neighbourhood committee with the name and contact information of a representative to direct their concerns;

(l) provide a community liaison officer (who may be the same individual as the representative referred to in Section 23.2(k)) to provide a single point of contact regarding construction and development issues;

(m) before commencing the Construction, prepare and implement in co-operation with the Owner a construction fire safety plan for the Project, which plan will describe emergency access routes to and from the Facility and the Site during an emergency.

23.3 If the Design-Builder performs any Construction outside of the area designated at the Site, the Design-Builder will comply with all policies and other requirements of the Owner.

24. INTEGRATION OF THE WORK WITH EXISTING SCHOOL OPERATIONS

24.1 The Design-Builder acknowledges and agrees that the Existing School will continue to be operated as an educational facility and event space by the Owner during Construction for the benefit of students, staff, parents and other third parties. The Existing School must remain fully operational at all times during Construction.

24.2 Without limiting the other requirements of this Agreement, the Design-Builder will:

(a) co-operate with the Owner to co-ordinate any activities that may impact the operations of the Existing School;

(b) provide to the Owner for review a construction plan that includes:

(i) maintaining vehicle, pedestrian and fire access to the Existing School;

(ii) preventing the introduction of any materials or chemicals on to the Site which would impact the operation of the Existing School;

(iii) restricting vehicular and machinery traffic to only those vehicles and machinery that are essential to, and actively engaged in, performing the Work; and

(iv) compliance with safety requirements;

(c) prior to performing any Work outside of the Site or that may interfere with the regular operation of the Existing School, deliver to the Owner and obtain the Owner's approval of a work plan (the **"Work Plan"**) clearly identifying:

(i) the activity that is located outside the Site or that may interfere with the operation of the Existing School, including a description of the nature, timing and extent of interference;

(ii) the steps the Design-Builder intends to take to minimize the extent of such interference;

(iii) the temporary measures that the Owner will be required to take to accommodate the interference;

(iv) any specific reporting relationships between the Design-Builder and the staff desirable or required to coordinate the interference; and

(v) any expansion of the area of the Site for the purpose of performing the Work indicated in the Work Plan,

unless the Owner, at its discretion, notifies the Design-Builder in writing that a Work Plan will not be required for particular work.

24.3 Prior to delivering a Work Plan, the Design-Builder will consult with the Owner and, upon reasonable request, the Owner will make appropriate staff available for such consultation to determine the Work Plan that minimizes interference to the regular operation of the Existing School. The Design-Builder will not proceed with any work that interferes with the regular operation of the Existing School without:

(a) the Owner's prior written approval of a Work Plan under this Section 24, such approval not to be unreasonably withheld or delayed; or

(b) advance written notice from the Owner confirming that a Work Plan is not required.

25. SIGNAGE

25.1 The Design-Builder may erect signage at the Site during Construction to identify the Design-Builder and Subcontractors provided such signage and its location(s) is acceptable to the Owner, acting reasonably. The Design-Builder will also erect the Owner's signage as required by the Owner.

26. USE OF SITE

26.1 The Design-Builder will confine its construction machinery and equipment, tools, storage of materials and products, and the operations of workers to limits indicated in the Site Plan, Project Management Plan or Work Plan or by or under all applicable Laws, and will not unreasonably encumber the Site or other activities on the Site.

26.2 The Design-Builder will comply with the Owner's policies, procedures and instructions, including regarding parking, safety, harassment, fires, smoking, signs and advertisements.

26.3 The Design-Builder will not load or permit to be loaded any part of the Construction with a weight or force that endangers the safety of the Project.

26.4 The Design-Builder will ensure that the Work does not adversely impact the ongoing operations of the Owner, or any person on behalf of the Owner, near or adjacent to the Site.

26.5 The Design-Builder will confirm the location of all utilities and ensure that all of its labour force, employees, Subcontractors and any other workers at the Site:

(a) are made aware of the location of all utilities in connection with the Project and the importance of avoiding damage to those underground utilities;

(b) observe any instructions in connection with those utilities issued by the Owner on behalf of any applicable utility owners; and

(c) protect all such utilities.

27. CONDITIONS AT SITE/DISCLOSED DATA

27.1 The Design-Builder acknowledges and agrees that:

(a) it has received and reviewed a copy of all Site Reports;

(b) it has had the opportunity to undertake examinations and investigations of the Site in order to satisfy itself as to Site conditions and the impact they could have on any or all of the Work (including Design and Construction), Contract Time and Contract Price;

(c) only objective geotechnical data provided in the Site Reports can be relied upon for accuracy (subject to any qualifications or conditions set out in such information or this Agreement) but such data cannot be relied upon for sufficiency, relevancy or interpretation;

(d) neither the Owner, the Owner's Representative, the Owner's Consultant nor any other person on behalf of the Owner is in any way responsible or liable for the completeness, interpretation or accuracy of the Site Reports (except accuracy of objective geotechnical data identified in Section 27.1(c)) or for any variation between Site conditions actually encountered by the Design-Builder and those set out in the Site Reports; and

(e) subject to Sections 27.3, 28 and 29, the Design-Builder is not entitled to any adjustment in the Contract Time or Contract Price, or to any other remuneration, compensation or damages whatsoever, in any way connected with Site conditions.

27.2 It is the Design-Builder's responsibility to have conducted its own analysis and review of the Project and, before the execution of this Agreement, to have taken all steps it considers necessary to satisfy itself as to the accuracy, completeness and applicability of any Disclosed Data upon which it places reliance and to assess all risks related to the Project. Except with respect to the accuracy of objective geotechnical data identified in Section 27.1(c) the Design-Builder will not be entitled to and will not make (and will ensure that no Subcontractor makes) any claim against the Owner or any Indemnified Party, whether in contract, tort or otherwise including any claim in damages for extensions of time or for additional payments under this Agreement on the grounds:

(a) of any misunderstanding or misapprehension in respect of the Disclosed Data;

(b) that the Disclosed Data was incorrect or insufficient; or

(c) that incorrect or insufficient information relating to the Disclosed Data was given to it by any person other than the Owner,

nor will the Design-Builder be relieved from any obligation imposed on or undertaken by it under this Agreement on any such ground.

27.3 The Design-Builder, in order to design the Facility, is responsible for obtaining sufficiently accurate, complete and applicable geotechnical information necessary to properly design a foundation and structure of the Facility that is appropriate for the soils conditions. This may require supplementing the Disclosed Data. Accordingly, the Design-Builder is not entitled to any adjustment in the Contract Time or Contract Price, or to any other remuneration, compensation or damages whatsoever, in any way connected with Site conditions, including the matters described in Section 27.2 if it has failed to obtain sufficient geotechnical information necessary to prepare a Design that reasonably anticipates the soils conditions actually encountered.

27.4 If the Design-Builder is delayed in performing the Work as a result of inaccuracy in the objective geotechnical data provided in the Site Reports, the Design-Builder's entitlement to an extension of the Contract Time and reimbursement of costs will be determined in accordance with Section 50. If the Design-Builder is not delayed in performing the Work but incurs additional costs as a result of inaccuracy in the objective geotechnical data provided in the Site Reports, adjustment in the Contract Time or the Contract Price will be agreed upon or determined in accordance with Section 47 (Valuation and Certification of Changes).

28. ARCHAEOLOGICAL ITEMS

28.1 Upon discovery at the Site of any fossils, remains, coins, articles of value or antiquity, including all heritage objects (as defined in the *Heritage Conservation Act* (British Columbia)), the Design-Builder will:

(a) immediately notify the Owner;

(b) take all steps not to disturb the item and, if necessary, stop Construction to the extent required if performing the Construction would endanger the object or prevent or impede its excavation;

(c) take all necessary steps to preserve the item in the same position and condition in which it was found; and

(d) comply with all Laws and regulations and all requirements of governmental authorities with respect to such discovery including pursuant to the *Heritage Conservation Act* (British Columbia).

28.2 If the Design-Builder is delayed in performing the Work taking steps required under Section 28.1, the Design-Builder's entitlement to an extension of the Contract Time and reimbursement of costs will be determined in accordance with Section 50. If the Design-Builder is not delayed in performing the Work but incurs additional costs as a result of taking steps required under Section 28.1, adjustment in the Contract Time or the Contract Price will be agreed upon or determined in accordance with Section 47.

29. CONTAMINANTS AND ENVIRONMENTAL MANAGEMENT

29.1 The Design-Builder acknowledges and agrees:

(a) it has received and reviewed a copy of the following reports:

(i) 234350.000 Phase I ESA Report, Eric Hamber Secondary School, 5025 Willow St, Vancouver, BC, SD39, FINAL (Pinchin Ltd.), January 31, 2019;

(ii) 234350.001 Soil Characterization Report, 5025 Willow Street, Vancouver, BC, SD39, FINAL (Pinchin Ltd.), June 18, 2019;

(iii) Thurber_20191010_EHS Factual Report for Additional Drilling_27267, October 10, 2019; and

(iv) Thurber_20191122_EHS Arsenic Investigation_27267, November 22, 2019.

(the "**Environmental Reports**");

(b) it has had the opportunity to undertake examinations and investigations of the Site, including existing buildings and facilities, in order to satisfy itself as to Site conditions and the impact they could have on any or all of the Work (including Design and Construction), Contract Time, and Contract Price;

(c) it is responsible for all management, removal, abatement, containment and disposal of Contaminants disclosed in or reasonably inferred from the Environmental Reports; and

(d) neither the Owner nor the Owner's Representative nor any other person on behalf of the Owner is in any way responsible or liable for the completeness, interpretation or accuracy of the Environmental Reports.

29.2 The Design-Builder acknowledges that the Owner has made no representation or warranty as to the absence or presence on, in or under the Site of any Contaminant. If the Design-Builder, after commencing the Work, encounters or has reason to believe in the existence of any Contaminant on, in or under the Site, the Design-Builder will at once take all reasonable steps, including suspension of the Work, as necessary to ensure that no person or property suffers injury, sickness, death, damage or destruction as a result of exposure to, or the presence of, any Contaminant, and the Design-Builder will immediately report such Contaminant to the relevant governmental authorities and to the Owner.

29.3 If the Design-Builder is delayed in performing the Work due to discovery of Contaminants, other than those disclosed in or reasonably inferred from the Environmental Reports, by taking steps required under Section 29.2, the Design-Builder's entitlement to an extension of the Contract Time and reimbursement of costs will be determined in accordance with Section 50. If the Design-Builder is not delayed in performing the Work but incurs additional costs due to discovery of such Contaminants, other than those disclosed in or reasonably inferred from the Environmental Reports, adjustment in the Contract Time or the Contract Price will be agreed upon or determined in accordance with Section 47.

30. SITE SAFETY

30.1 The Design-Builder agrees to be the "prime contractor" for the purposes of all applicable occupational health and safety Laws, including the *Workers Compensation Act* (British Columbia), and the Design-Builder is responsible for filing any documents necessary to comply with the *Workers Compensation Act* (British Columbia), including a notice of project. The Design-Builder will comply with all requirements of the *Workers Compensation Act* (British Columbia) and any other occupational health and safety Laws, applicable to the Project, the Work or to the Site. The Owner will comply, and will cause Other Contractors to comply, with occupational health and safety requirements established by the Design-Builder to fulfil the Design-Builder's obligations as "prime contractor".

30.2 Prior to commencing the Work and as a condition of receiving payment on Substantial Completion and on Total Completion, the Design-Builder will provide the Owner with satisfactory written evidence of compliance by the Design-Builder with all requirements under the *Workers Compensation Act* (British Columbia), including payments of assessments due under it to the Workers' Compensation Board. Without limiting the foregoing, the Owner may at any time require the Design-Builder to provide evidence of compliance with all requirements under the *Workers Compensation Act* (British Columbia), or payment of assessments due under it to the Workers' Compensation Board, or both.

30.3 When required to do so by the Owner, the Design-Builder will provide the Owner with evidence of its compliance and compliance of any or all of its Subcontractors under Section 30.2.

30.4 Following the Site Occupation Date, the Design-Builder will coordinate health and safety for the Site for all activities performed by its workers as well as those of Subcontractors, utilities, inspectors, the Owner, Other Contractors and any others performing any activities at the Site.

30.5 The Design-Builder will establish, implement and provide for the review by the Owner, by no later than 180 days after the Effective Date, a plan (the "**Health and Safety Plan**") that meets all applicable requirements of this Agreement with respect to health and safety at the Site and that addresses the safety of the Owner, students, staff, local residents and others who may be on the Site or property in the vicinity of the Site. The Design-Builder will provide safety fencing and hoarding as necessary to limit access to the Site in accordance with the Health and Safety Plan.

30.6 The Design-Builder will ensure that its Health and Safety Plan is consistent with, and accommodates any requirements of, the Owner's policies regarding safety and that it specifically addresses the safety of the Owner, students, staff, local residents, visitors and others who may be on the Site or on property in the vicinity of the Site.

30.7 The Design-Builder will maintain and comply with the Health and Safety Plan in all material respects during execution of the Work.

30.8 Prior to any person accessing the Site pursuant to this Agreement, the Design-Builder will provide health and safety orientation and information to such person in accordance with its Health and Safety Plan.

31. DUST, NOISE AND VIBRATION

31.1 The Design-Builder will carry out its Construction to minimize dust, noise, vibration, noxious odours and fumes.

31.2 Without limiting Section 31.1, the Design-Builder will discuss with the Owner any expected vibration from the Construction activities, will plan operations to minimize disruption and impact to the Existing School, and will carry out its Construction activities, so that dust, noise, vibration, noxious odours and fumes do not unreasonably and adversely affect the Existing School or use of properties in the vicinity of the Site.

32. TESTING AND COMMISSIONING

32.1 The Design-Builder will prepare and deliver to the Owner's Representative and the Owner's Consultant a detailed plan (the "**Commissioning Plan**") setting out the testing, commissioning, training and other activities the Design-Builder intends to carry out to satisfy this Section 32 and to achieve Substantial Completion, including:

(a) a description of the specific equipment and systems to be tested and commissioned and the associated commissioning requirements, including those to be completed before Substantial Completion;

(b) supporting documentation, including as appropriate:

(i) design calculations and/or assumptions;

(ii) manufacturer's specifications;

(iii) identification of all equipment and systems that require or are provided with redundancy or spare capacity and that will include complete successful demonstration in real time under full stress conditions;

(iv) a description of all systems which will be tested and commissioned for integration to other systems; and

(v) a description of all systems and equipment where the Owner's staff will be required to develop functional scenarios and to test and witness these functional scenarios;

(c) a description of the training and education that the Design-Builder intends to provide to the Owner's staff to enable the Owner to properly utilize the equipment and systems installed in the Facility, including all training and education to be completed before Substantial Completion;

(d) the name of the commissioning agent and the names of other persons to be involved in testing, commissioning and training;

(e) a description of the Design-Builder's system for managing records of tests, inspections, quality assurance and training;

(f) a general description of the Design-Builder's transition plans for handover to the Owner of the Facility at Substantial Completion;

(g) a schedule, related to the Time Schedule, showing:

(i) the timing of all testing and commissioning, training and acceptance testing;

(ii) for each requirement of Substantial Completion relating to commissioning, the date upon which the Design-Builder anticipates achieving the requirement;

(iii) a matrix of all equipment and systems, including all integrated equipment and systems, and how they integrate with each other, along with an overview of the procedures that will be followed to demonstrate that integration of all equipment and systems has been and will be achieved; and

(iv) the timing and development of the functional scenarios with the Owner's staff; and

(h) any other requirements as set out in Schedule 1 - Statement of Requirements.

32.2 The Commissioning Plan must be reasonable having regard to the requirements of this Section 32, and will be developed and finalized as follows:

(a) the Design-Builder will deliver a preliminary draft of the Commissioning Plan to the Owner at the 60% design stage;

(b) the Design-Builder will deliver an updated draft of the Commissioning Plan to the Owner not less than 12 months before the Target Substantial Completion Date, failing which, the Design-Builder will pay to the Owner by way of liquidated damages and not as a penalty the sum of $2,500 per week for each week or part thereof that the Design-Builder fails to deliver the updated draft. If the Design-Builder has not delivered to the Owner an updated draft of the Commissioning Plan by the date falling 9 months before the Target Substantial Completion Date, the liquidated damages applicable under this Section 32.3 will increase to $5,000 per week for each week or part thereof that the Design-Builder has not delivered to the Owner the aforementioned preliminary draft;

(c) the Owner will provide its comments, if any, on the preliminary and updated drafts of the Commissioning Plan to the Design-Builder within 20 Business Days of receipt of such drafts;

(d) the Design-Builder will deliver a revised draft of the Commissioning Plan to the Owner not less than 40 Business Days after receipt of the Owner's comments on the updated draft, failing which, the Design-Builder will pay to the Owner by way of liquidated damages and not as a penalty the sum of $5,000 for each week or part thereof after the date falling 40 Business Days after the Owner's comments were received by the Design-Builder until the Design-Builder has delivered to the Owner a revised draft of the Commissioning Plan;

(e) The liquidated damages in Section 32.2(b) and (d) will be the Owner's sole claim for damages against the Design-Builder for failure to deliver the updated draft or the revised

draft of the Commissioning Plan by the required dates, as the case may be. The liquidated damages will not relieve the Design-Builder from its obligation to complete the updated or revised draft of the Commissioning Plan or from any other duties, obligations or responsibilities of the Design-Builder under this Agreement, and will not limit the Owner's rights to terminate this Agreement for default of the Design-Builder under this Agreement. The Owner and the Design-Builder agree that the amounts in Section 32.2(b) and (d) represent a genuine pre-estimate of the damages and expenses that the Owner is likely to incur for such failure of the Design-Builder to deliver the updated or revised draft of the Commissioning Report, as the case may be, and both parties expressly agree that such amount is not a penalty. The Owner may, in its discretion, either deduct the weekly sums in respect of liquidated damages from the Performance Holdbacks or any amounts payable to the Design-Builder under this Agreement or may require payment thereof by the Design-Builder on demand;

(f) the Owner will, within 15 Business Days of receipt of the revised draft, advise the Design-Builder whether the Owner accepts the Commissioning Plan, and if the Owner does not accept it the Owner will provide its reasons for such non- acceptance in sufficient detail to allow the Design-Builder to address them;

(g) if the Owner does not accept the Commissioning Plan, the parties will, acting reasonably, diligently work together with a view to revising the Commissioning Plan to address the Owner's reasons for non-acceptance; and

(h) if the Owner has not accepted the Commissioning Plan by the date that is 6 months before the Target Substantial Completion Date, the Design-Builder may refer the Dispute for resolution in accordance with Section 62.

32.3 The Design-Builder will retain a qualified independent commissioning agent (acceptable to the Owner, acting reasonably), to test and commission all equipment and systems in the Facility to demonstrate to the Owner that the Facility equipment and systems, including all major systems, are fully operational and that the Owner may occupy the Facility for its intended use as described in the Statement of Requirements. The commissioning agent will prepare a written report to confirm the foregoing and confirm completion of all commissioning activities before Substantial Completion. Testing and commissioning will include, among other things, the following:

(a) a complete and successful demonstration in real time under full stress conditions for all equipment and systems that require or are provided with redundancy or spare capacity;

(b) end to end testing and commissioning of key equipment and systems including but not limited to all equipment, communication systems (wireless communications, intercom, overhead paging, telephones) and door controls; and

(c) technical and operational validation or proper functioning of all equipment and systems and all points of integration between such equipment and systems.

33. DOCUMENTS AT THE SITE

33.1 The Design-Builder will keep at least 1 copy of the following documents at the Site in good order and available to the Owner:

(a) a copy of this Agreement;

(b) a copy of all development, building, electrical and plumbing permits and inspection reports;

(c) up to date and current Drawings and Specifications, including any shop drawings prepared or obtained in respect of the Work;

(d) the Project Management Plan;

(e) the Time Schedule;

(f) the Quality Management Plan;

(g) the Work Plan; and

(h) the Health and Safety Plan.

34. CLEANUP AND FINAL CLEANING OF WORK

34.1 The Design-Builder will comply with Schedule 10 - Cleaning and Waste Management.

34.2 As a condition of achieving Substantial Completion, the Design-Builder will undertake a major cleaning of the Facility and the Site such that:

(a) it is clean and suitable for occupancy and use by the Owner; and

(b) the requirements of Schedule 10 - Cleaning and Waste Management have been met.

34.3 In connection with any Work performed after the Substantial Completion Date, the Design-Builder will at all times leave the Facility, the Work and the Site clean and suitable for occupancy and use by the Owner but is not required to remove waste caused by the Owner, Other Contractors or their employees.

35. REMEDIAL WORK

35.1 The Design-Builder will do all remedial work that may be required to make the several parts of the Work comply with the Statement of Requirements.

35.2 The Design-Builder will coordinate the Time Schedule for the Work to ensure that the requirement under Section 35.1 is kept to a minimum.

35.3 Remedial work will be performed by specialists familiar with the materials affected and will be performed in a manner to neither damage nor endanger any Work.

36. REJECTED WORK

36.1 Defective Work, whether the result of poor design, poor workmanship, use of defective equipment or materials, or damage through carelessness, default or other acts of the Design-Builder or any Subcontractor, and whether incorporated in the Work or not, which has been rejected by the Owner as failing to conform to any of the Statement of Requirements, the Design or the Standards, will be removed promptly by the Design-Builder and replaced and re-executed promptly and properly at the Design-Builder's expense.

36.2 If the Design-Builder does not remove such defective Work within the time fixed by written notice by the Owner, the Owner may remove them and store any materials at the expense of the Design-Builder.

36.3 Other Contractor's work destroyed or damaged by such removals or replacements will be made good by the Design-Builder promptly at the Design-Builder's expense.

37. WARRANTY

37.1 The Design-Builder will promptly correct, at its own expense, any Work that is not in accordance with this Agreement and any defects or deficiencies in the Work that appear during the period of 24 months after the Substantial Completion Date (the "**Warranty Period**").

37.2 The Design-Builder will correct defects or deficiencies at times and in a manner which causes as little inconvenience to the occupants of the Facility and the Owner's operations on and adjacent to the Site as is reasonably possible.

37.3 The Owner may carry out, or have others carry out, rectification work at the Design-Builder's cost if:

(a) the Owner gives notice to the Design-Builder of a defect or deficiency and the Design-Builder does not correct the defect or deficiency within a reasonable time, not to exceed 14 days, unless the nature of the defect or deficiency is such that it cannot be corrected within such time and the Owner, acting reasonably, agrees to an extension of such time; or

(b) the nature of the defect or deficiency is such that it creates a risk to the health or safety of any occupant or user of the Facility, or risk of damage to the Facility, the environment or any property and the Owner gives notice to the Design-Builder within a reasonable time after the commencement or completion of the rectification work.

37.4 If the Owner carries out or has others carry out the rectification work pursuant to Section 37.3 the Design-Builder remains responsible for the Work (including the rectification work).

37.5 The Design-Builder will provide to the Owner extended warranties from Subcontractors where required by the Proposal Extracts or other provisions of this Agreement and any other extended warranties provided by Subcontractors.

37.6 The Design-Builder will correct, at its own cost, or pay the Owner for any damage resulting from the defects or deficiencies and the corrections required under Section 37.1.

37.7 Issuance of the Substantial Completion Certificate and the Total Completion Certificate, and final payment to the Design-Builder, do not relieve the Design-Builder from its responsibility under this Section 37.

38. TITLE AND RISK

38.1 Title to the Work will vest only in the Owner. Without prejudice to any of the rights of the Owner under this Agreement, title to the Work or any part of the Work will vest in the Owner at the earliest of:

(a) the time that the Work or part of it is at the Site;

(b) the time that the Owner has paid for the Work or part of the Work; and

(c) the time of installation or construction of the Work or part of the Work.

38.2 The Work will remain under the care, custody and control of the Design-Builder and at the risk of the Design-Builder until Substantial Completion or until such earlier date determined by the Owner, and notified in writing to the Design-Builder, for occupancy and use by the Owner. The Design-Builder will exercise all reasonable care to avoid loss of, or damage to, the Work.

38.3 The Design-Builder represents and warrants that title to the Work and any part of the Work will pass to the Owner free and clear of all liens, charges and encumbrances.

PART D - PAYMENT AND COMPLETION

39. APPLICATIONS FOR PAYMENT

39.1 The Design-Builder will make applications for payment in accordance with this Section 39.

39.2 Applications for payment will be:

(a) submitted to the Payment Certifier;

(b) dated the last day of the monthly period;

(c) for the value, proportionate to the amount of the Contract Price, of Work performed and material delivered to the Site to and at the date of submission; and

(d) submitted no more than once per month during the performance of the Work.

39.3 Pending determination of the final result of any Change, the undisputed value of the Work performed as a result of a Change is eligible to be included with payment applications.

39.4 The Design-Builder will submit to the Payment Certifier for review, at least 14 days before the first application for payment, a Schedule of Values of the various parts of the Work, aggregating to the total amount of the Contract Price and divided so as to facilitate evaluation of applications for payment. The Schedule of Values will be consistent with the information set out in the breakdown of the Contract Price set out in Schedule 6 – Schedule of Prices and made out in such form and supported by such evidence as to its correctness as the Payment Certifier may reasonably require. If the Payment Certifier provides comments to the Design-Builder on the Schedule of Values, the Design-Builder will revise the Schedule of Values to address the comments, and so on, until such time as the Payment Certifier is satisfied with the Schedule of Values. The Schedule of Values will be used as the basis for all applications for payment, unless it is found at any time to be in error, in which case it will be corrected in accordance with the directions of the Payment Certifier. If the Schedule of Values is not finalized prior to an application for payment, the Payment Certifier may consider the applications for payment on the basis of the Schedule of Values under review and the comments of the Payment Certifier on such Schedule of Values or such other basis as determined by the Payment Certifier.

39.5 When making applications for payment, the Design-Builder will submit a statement based upon the Schedule of Values. Claims for material and equipment delivered to the Site but not yet incorporated into the Work will be supported by such evidence as the Payment Certifier may reasonably require to establish the value and their delivery.

39.6 Subject to any further information that may be required by the Owner, the application for payment will include:

(a) the amount applied for in the application;

(b) the value of Work performed and material and equipment delivered to the Site;

(c) payment amounts in respect of any Changes to which the Design-Builder is entitled under this Agreement, including under Section 39.3;

(d) any adjustments to the Contract Price under this Agreement;

(e) the balance of the Contract Price to complete the Work;

(f) the amount of Lien Holdback;

(g) the amount of Performance Holdbacks;

(h) the amount of any withholding or amount to be released under Section 39.8;

(i) certification by the Design-Builder that the Project Binder includes documentation current to within at least 30 days prior to the application, including all inspection reports;

(j) a statutory declaration of an officer or senior management employee of the Design-Builder stating that all accounts for labour, subcontracts, materials, construction machinery and equipment and other indebtedness which may have been incurred by the Design-Builder in performing the Work and for which the Owner might in any way be held responsible have been paid in full, except for amounts properly retained as a holdback or as an identified amount in dispute; and

(k) a clearance letter from the Workers' Compensation Board indicating that all current assessments due from the Design-Builder and all Subcontractors with subcontracts larger than $50,000 in value have been paid.

39.7 Applications for release of the Lien Holdback will be made under Section 41 (Lien Holdback) and applications for any payment at Substantial Completion or Total Completion will be made under Section 43 (Substantial Completion and Total Completion).

39.8 It is a condition of payment that the following, and all documentation, certification and requirements of the following, are complete and up to date as of the date of each application for payment:

(a) Health and Safety Plan;

(b) Project Management Plan;

(c) Time Schedule;

(d) Quality Management Plan;

(e) Project Binder updated as described in Section 44.3;

(f) confirmation that there is no lien, charge or encumbrance asserted upon the Site, Project or any part thereof as described in Section 58.4;

(g) issued for construction Drawings and Specifications, commencing with the first application for payment 180 days prior to the Target Substantial Completion Date; and

(h) Commissioning Plan commencing with the first application for payment 180 days prior to the Target Substantial Completion Date.

The Design-Builder will not be required to re-submit documentation previously provided. The Design-Builder will identify any changes to previously submitted documentation and at the Owner's request submit revised documentation.

The Owner acknowledges that the requirement in Section 39.8(f) for issued for construction Drawings and Specifications does not require the Design-Builder to provide such Drawings and

Specifications prior to the date such Drawings and Specifications are required to perform the Work and in accordance with the other provisions of this Agreement.

If any of the foregoing listed items, including the required certification, documentation and certification for each listed item, is not complete and up to date, then the Owner may for each listed item that is not complete and up to date withhold from payment the amount of 3% of the total application for payment. This withholding will apply to each month for which such item or items is not complete and up to date. The applicable withholding will be released with the next monthly payment when such item is completed and up to date. In addition, in relation to the Quality Management Plan if the Owner's Consultant considers that the Design-Builder has not demonstrated that the Work to which the Quality Management Plan relates was satisfactorily performed then the Payment Certifier, in cooperation with the Owner's Consultant, may reduce the payment by the amount of such unsatisfactory Work and by the cost of the required processes, testing, certification, auditing and documentation required to ensure compliance with the Quality Management Plan, in accordance with Section 39.10.

39.9 Notwithstanding the actual progress, the following will apply:

(a) payment of the cost of the Bonds and cost of insurance will be made to the Design-Builder upon presentation of all bonding and insurance documentation required by this Agreement and upon presentation of satisfactory proof of payment of related fees or premiums; and

(b) payment for mobilization identified in the Schedule of Values will be a maximum of 1% of the Contract Price and payment will be made in two parts: 25% when the Design-Builder occupies the Site, and 75% when the Design-Builder has established a fully functional site office, construction equipment is on the Site and construction has commenced.

39.10 The Payment Certifier will, within 10 Business Days of receipt of the Design-Builder's application for payment, either:

(a) accept the amount set out in the application for payment; or

(b) adjust the amount of any payment to reflect the Payment Certifier's estimate of Work satisfactorily performed as of the date of the application for payment.

If the Payment Certifier amends the application for payment, the Payment Certifier will promptly notify the Design-Builder in writing and give reasons for the amendment.

39.11 Provided the Design-Builder is not in material default of any provision in this Agreement, the Owner will pay the Design-Builder within 15 Business Days of the Payment Certifier approving or adjusting the Design-Builder's application for payment in accordance with Section 39.10 and the Schedule of Values.

39.12 Whenever any sum of money is recoverable from or payable by the Design-Builder pursuant to this Agreement or is an amount for which the Owner may be liable on account of a default by the Design-Builder, the Owner may deduct or set off such sum from, or may reduce, any amounts then due or that may thereafter become due to the Design-Builder under this Agreement. Without limiting the generality of the foregoing, the Owner may set-off any amounts for liquidated damages set out in this Agreement.

39.13 If the Payment Certifier has approved or adjusted the Design-Builder's application for payment in accordance with Section 39.10 but payment has not yet been made to the Design-Builder and the Payment Certifier subsequently determines on the basis of new information that the amount

originally approved or adjusted for payment was incorrect, then the Payment Certifier will promptly issue a revised adjustment.

40. TAXES AND DUTIES

40.1 The Contract Price is inclusive of all applicable customs duties and taxes (including PST), other than GST, in effect at the Effective Date.

40.2 The Design-Builder will remit all customs duties and taxes to the applicable governmental authority as and when required by the relevant Law and will without limiting Section 57 (Indemnification), indemnify and hold the Indemnified Parties harmless from and against any customs duties and taxes that the Design-Builder fails to remit as and when due, and from and against any costs and penalties and interest that may be levied against the Indemnified Parties.

40.3 Any increase or decrease in costs to the Design-Builder due to changes in taxes or duties that are in effect at the Effective Date of this Agreement will increase or decrease the Contract Price accordingly.

40.4 Where an exemption or refund of taxes, customs duties or excise taxes is applicable to this Agreement by way of the Design-Builder filing claims for, or cooperating fully with the Owner and the proper authorities in seeking to obtain such exemption or refund, the Design-Builder will make such applications and provide such cooperation.

40.5 Refunds that are properly due to the Owner and have been recovered by the Design-Builder will be promptly refunded to the Owner.

41. LIEN HOLDBACK

41.1 The Owner will retain and release the Lien Holdback in accordance with the provisions of the *Builders Lien Act* (British Columbia).

41.2 For purposes of the *Builders Lien Act* (British Columbia), the Payment Certifier will be the payment certifier for this Agreement.

41.3 For purposes of progressive release of portions of the Lien Holdback in respect of Subcontracts, the Payment Certifier will be the payment certifier under the *Builders Lien Act* (British Columbia).

41.4 The Design-Builder will make application to the Payment Certifier for certification under the *Builders Lien Act* (British Columbia). As a condition of making any application and as a condition of any certification, the Design-Builder will provide the Payment Certifier with all information required by the Payment Certifier.

41.5 Without limiting Section 57, the Design-Builder will, at its sole risk and expense, do everything necessary, including through the institution, prosecution or defence of legal proceedings, to promptly discharge from title to the Site any claims of builder's lien, builder's liens or certificates of pending litigation by any Subcontractor or other person claiming under or through the Design-Builder or Subcontractor. If the Owner becomes aware that any such claim of builder's lien, builder's liens or certificate of pending litigation is threatened or has been registered against title to the Site, the Owner may, withhold out of the Lien Holdback or any other monies payable to the Design-Builder such amounts as the Owner reasonably considers necessary in order to secure the discharge of such claim of builder's lien, builder's liens or certificate of pending litigation. The Owner will cooperate with the Design-Builder in securing the discharge of any of the foregoing, subject to such arrangements being made as the Owner reasonably considers necessary before any such additional holdback monies are paid to any person or into court. This Section 41.5 will

not apply to a claim of builder's lien, builder's liens or certificates of pending litigation that arise due to the improper non-payment by the Owner.

42. PERFORMANCE HOLDBACKS

42.1 In addition to the Lien Holdback and any amount retained under this Agreement (including for deficiencies under Section 43.4), the Owner will retain:

(a) a holdback of of the Contract Price (the "**LD Holdback**") if at any time after the date that is 12 months before the Target Substantial Completion Date (or if the Owner has extended the Time Schedule in accordance with this Agreement, such other date established for the Target Substantial Completion Date) the Owner's Consultant determines that the Substantial Completion Date is not reasonably likely to occur on or before the Target Substantial Completion Date (or if the Owner has extended the Time Schedule in accordance with this Agreement, such other date established for the Target Substantial Completion Date);

(b) a holdback of $500,000 (the "**LEED Holdback**"); and

(c) a holdback of (the "**Warranty Holdback**")

(collectively, the "**Performance Holdbacks**").

42.2 The Performance Holdbacks will be calculated as a percentage of the Contract Price and that percentage will be withheld from all payments, subject to Section 42.1(a), due by the Owner. The percentage applicable to payments will be adjusted as required from time to time if the Contract Price is adjusted.

42.3 The Owner will release the LD Holdback, less liquidated damages payable by the Design-Builder under Section 3.3 upon the achievement of Substantial Completion.

42.4 The Owner will release the LEED Holdback upon the achievement of LEED Gold Certification for the Facility, provided such certification occurs within the time period set out in Section 10.1(h).

42.5 The Owner will release the Warranty Holdback, less deductions for amounts owing to the Owner, upon the completion of the Warranty Period and satisfaction of all obligations of the Design-Builder under Section 37.

42.6 The Owner may apply the Performance Holdbacks against any amount owing by the Design-Builder to the Owner either prior to the Substantial Completion Date or during the Warranty Period. If any amount is applied against the Performance Holdbacks, the Design-Builder will at the Owner's option, acting reasonably, either pay such amount to the Owner to replenish the Performance Holdbacks then required to be withheld, or the Owner may withhold such amount from the next payment or payments due to the Design-Builder.

42.7 The Design-Builder will apply for payment of the applicable Performance Holdback and payment will be made in accordance with Section 39.

42.8 The Performance Holdbacks are not held in trust for the Design-Builder, property of the Design-Builder, earned by the Design-Builder or due and payable by the Owner until the conditions for release of the Performance Holdbacks are satisfied.

42.9 The Design-Builder as an alternative to the retention of the Performance Holdbacks may propose to the Owner to provide either a clean irrevocable standby letter of credit from a financial institution in Canada in a form acceptable to the Owner, or another form of performance security

acceptable to the Owner. If the Owner accepts the proposal, the Owner will upon receipt of the performance security release the Performance Holdbacks to the Design-Builder.

43. SUBSTANTIAL COMPLETION AND TOTAL COMPLETION

43.1 The Design-Builder may make application to the Owner for the Substantial Completion Certificate at any time after it believes it has achieved Substantial Completion, as described in this Section 43 and has provided to the Owner the items as required in Section 43.2(b).

43.2 "**Substantial Completion**" means that all of the following have been achieved:

(a) the Payment Certifier has certified that substantial performance of the Work under the *Builders Lien Act* (British Columbia) has been achieved;

(b) the Facility is ready for use by the Owner or is being used by the Owner for the purpose intended, and the following items have been submitted to the Owner or completed by the Design-Builder:

(i) all equipment, mechanical and other systems are in place, commissioned, received required certifications, and are fully operational;

(ii) a complete Project Binder, provided that:

(A) the commissioning reports may be preliminary; and

(B) the inspections, certificates, guarantees and warranties, and certifications may exclude only the items of Work that remain to be completed;

(iii) up to date and current Drawings and Specifications;

(iv) maintenance and operating tools, replacement parts or products as specified in the Statement of Requirements;

(v) a clearance letter from the Workers' Compensation Board indicating that all current assessments due from the Design-Builder and all Subcontractors have been paid;

(vi) a statement reconciling all Change Orders and claims under this Agreement with respect to the Work to the date of the application for Substantial Completion;

(vii) all approvals necessary for the Project from local authorities having jurisdiction;

(viii) an occupancy permit for the Facility as required from local authorities having jurisdiction;

(ix) a statutory declaration, using CCDC 9A or a similar form acceptable to the Owner, of an officer or senior management employee of the Design-Builder stating that all accounts for labour, subcontracts, materials, construction machinery and equipment and other indebtedness which may have been incurred by the Design-Builder in performing the Work and for which the Owner might in any way be held responsible have been paid in full, except for amounts properly retained as a holdback or as an identified amount in dispute;

(x) demonstration and training of all mechanical and electrically operated devices to the Owner's operating and maintenance staff;

(xi) all training required by the Statement of Requirements;

(xii) the LEED project checklist and written opinion as required by and in accordance with Section 10.2(a);

(xiii) the requirements of Schedule 10 - Cleaning and Waste Management and Section 34 have been fulfilled to the extent required by the Substantial Completion Date; and

(xiv) any other conditions specified in this Agreement with respect to achieving Substantial Completion;

(c) a comprehensive deficiency list, including an estimated value for each item, has been submitted to the Owner's Consultant by the Design-Builder which will be supplemented by the Owner's Consultant acting reasonably; and

(d) a schedule for completion of all remaining Work has been submitted to the Owner by the Design-Builder.

43.3 The Payment Certifier, in cooperation with the Owner and the Owner's Consultant and with input from the Design-Builder's Consultant will, not later than 10 days after the receipt of an application by the Owner from the Design-Builder for the Substantial Completion Certificate, review and assess the Work to verify that the application and the Work conform to the requirements set out in Section 43.2. The Payment Certifier will, not later than 7 days after the review, notify the Design-Builder of approval, or the reasons for disapproval, of the application. In the event of disapproval, the Design-Builder will rectify all matters that prevent the issuance of the Substantial Completion Certificate and the Payment Certifier, in cooperation with the Owner and the Owner's Consultant, will within 7 days after notice from the Design-Builder of rectification, approve or disapprove of the application, and so on, until such time as the Payment Certifier determines that Substantial Completion has been achieved. When the Payment Certifier determines that Substantial Completion has been achieved, the Payment Certifier will issue the Substantial Completion Certificate. Following the issuance of the Substantial Completion Certificate, the Owner's Consultant, with input from the Design-Builder, will establish a reasonable date for work still to be satisfactorily performed or replaced as specified in the list of deficiencies and for Total Completion. The Design-Builder will be responsible for all costs of any additional reviews by the Owner's Consultant or the Payment Certifier after the first review that are necessary under this Section, where such additional reviews reveal that previously identified deficiencies or non-conformances to the requirements set out in Section 43.2 have not been corrected or completed in a manner satisfactory to the Owner's Consultant. Such costs will be deducted from any monies then due to the Design-Builder.

43.4 The Owner may retain out of the amount due and owing to the Design-Builder upon Substantial Completion:

(a) any sums required by law to satisfy any liens against the Work; and

(b) an amount determined by the Payment Certifier to be equal to 3 times the estimated value of the Work as determined by the Payment Certifier that is still to be satisfactorily performed or rectified or replaced to address the issues specified in the list of deficiencies; and

(c) any amount withheld pursuant to Section 41.5.

43.5 No payment will be made to the Design-Builder from amounts withheld under Section 43.4(b) until the completion or rectification or replacement of all the deficiencies and incomplete work specified in the deficiency list.

43.6 The Design-Builder will perform the work specified in the list of deficiencies at times and in a manner which causes as little inconvenience to the occupants of the Facility and the Owner's operations on and adjacent to the Site as is reasonably possible.

43.7 The Owner may carry out, or have others carry out, the work specified in the list of deficiencies at the Design-Builder's cost if:

(a) the Design-Builder does not complete the work by the date established by the Owner's Consultant in Section 43.3 and if the Owner gives notice to the Design-Builder and the Design-Builder does not complete, correct or replace the defect, deficiency or incomplete work within a reasonable time, not to exceed 14 days, unless the nature of the defect, deficiency or incomplete work is such that it cannot be completed or corrected within such time and the Owner, acting reasonably, agrees to an extension of such time; or

(b) the nature of the work is such that it creates a risk to the health or safety of any occupant or user of the Facility, or risk of damage to the Facility, the environment or any property and the Owner gives notice to the Design-Builder within a reasonable time after the commencement or completion of the rectification work.

43.8 If the Owner carries out or has others carry out the work pursuant to Section 43.7 the Design-Builder remains responsible for the work.

43.9 The Design-Builder will correct, at its own cost, or pay the Owner for any damage resulting from the work specified in the list of deficiencies.

43.10 The Design-Builder may make application to the Owner for the Total Completion Certificate at any time it believes it has achieved Total Completion as described in Section 43.11 and has provided to the Owner the items as required in Section 43.11(d).

43.11 "**Total Completion**" means that all of the following have been achieved:

(a) the entire Work has been performed to the requirements of this Agreement other than:

(i) work required to be performed under Section 37; and

(ii) achievement of the LEED credits/points and LEED Gold Certification from USGBC under Section 10;

(b) all deficiencies specified in the deficiency list(s) have been rectified or completed to the Owner's satisfaction;

(c) the requirements of Section 34 have been fulfilled; and

(d) the following items have been submitted by the Design-Builder and are acceptable to the Owner:

(i) all Submittals, including certified Record Drawings in accordance with Section 44 (Project Binder and Record Drawings)

(ii) the final Project Binder, including final commissioning reports, final inspections (structural, environmental, etc.) and deficiency reports;

(iii) a statutory declaration of an officer or senior management employee of the Design-Builder stating that all accounts for labour, subcontracts, materials, construction machinery and equipment and other indebtedness which may have been incurred by the Design-Builder in performing the Work and for which the Owner might in any way be held responsible have been paid in full, except for amounts properly retained as a holdback or as an identified amount in dispute, dated at least 45 days after the date of substantial performance under the *Builders Lien Act* (British Columbia);

(iv) a written statement of the Design-Builder that all claims for payment for Work done under this Agreement including claims and Change Orders have been presented to the Owner;

(v) a clearance letter from the Workers' Compensation Board indicating that all current assessments due from the Design-Builder and all Subcontractors have been paid; and

(vi) certification, acceptable to the Owner, that all taxes, employment assistance payments, Canada Pension Plan contributions, duties, royalties and all other monies required to be paid by law or statute have been paid in full.

43.12 Upon receipt by the Owner of the Design-Builder's application for the Total Completion Certificate:

(a) The Payment Certifier, in cooperation with the Owner and the Owner's Consultant, will, subject to the conditions contained in Section 43.11, and not later than 10 days after the receipt of an application from the Design-Builder for the Total Completion Certificate, review and assess the Work to verify that the application and the Work conform to the requirements set out in Section 43.11.

(b) The Payment Certifier will, and not later than 7 days after the review contemplated in Section 43.12(a), notify the Design-Builder of approval, or the reasons for disapproval, of the application. In the event of a disapproval, the Design-Builder will rectify all matters that prevent the issuance of the Total Completion Certificate and the Payment Certifier will within 7 days after notice from the Design-Builder of rectification, review and assess the Work, and approve or disapprove of the application, and so on, until such time as the Owner's Consultant determines that Total Completion has been achieved.

(c) The Design-Builder will be responsible for all costs of additional reviews required for by Section 43.12(b), such costs to be deducted from the monies due to the Design-Builder, where any additional review undertaken by the Owner's Consultant or the Payment Certifier pursuant to this Section reveals that previously identified deficiencies have not been corrected in a manner satisfactory to the Payment Certifier.

When the Payment Certifier determines that Total Completion has been achieved, the Payment Certifier will issue the Total Completion Certificate and certify for payment the monies due to the Design-Builder under this Agreement, less any amount still retained for the Lien Holdback or the Performance Holdbacks, amounts withheld under Section 41.5 or any amount set-off in accordance with this Agreement. The date of Total Completion will be as stated in the Total Completion Certificate.

43.13 No payment made by the Owner under this Agreement, or partial or entire use or occupancy of the Work by the Owner, will constitute an acceptance of Work not in accordance with the requirements of this Agreement.

43.14 By issuing any certificate, the Owner, the Owner's Consultant and the Payment Certifier do not guarantee, or otherwise become liable or responsible in any way for, the correctness or completeness of the Work, including the Design, and no certificate makes the Owner, the Owner's Consultant or the Payment Certifier in any way responsible or liable for adequacy of the Design or for the Work, all of which remain the responsibility of the Design-Builder.

43.15 As of the date of Total Completion, the Design-Builder expressly waives and releases the Owner from all claims against the Owner, including those that might arise from the negligence or breach of this Agreement by the Owner, except those made in writing prior to the Design-Builder's application for payment upon Total Completion and still unsettled and those arising in connection with the obligations of either party to be performed after Total Completion.

43.16 In the event of conflict between the provisions of this Section 43 and any other Section of this Agreement, the provisions of this Section 43 govern.

43.17 Without limiting any other withholding or set-off under this Agreement, the Owner may deduct from any payment to the Design-Builder under this Agreement the amount paid by the Owner to put the Design-Builder into compliance with the Insurance Conditions if the Design-Builder has defaulted in complying with the Insurance Conditions.

44. PROJECT BINDER AND RECORD DRAWINGS

44.1 The Design-Builder will prepare and provide to the Owner a set of documentation that is bound in three-post, expandable, Vancouver Book Binding Model VBB-3-5 (or a similar model if the Owner provides prior approval), black, durable, plastic bound binders with index pages and tabs (the "**Project Binder**"). The Design-Builder will ensure that the Project Binder:

(a) provides 25% spare space for future additional content;

(b) provides a separate section for the Childcare Centre; and

(c) includes the Project name, Substantial Completion Date, and a label imprinted in gold foil on the front cover and spine of the Project Binder.

44.2 The Project Binder will include the following:

(a) commissioning reports satisfactory to the Owner;

(b) all inspections, certifications, guarantees and warranties;

(c) maintenance manuals and operating instructions including architectural, electrical and HVAC manuals;

(d) certification by all testing, cleaning or inspection authorities or associations;

(e) confirmation of the Design-Builder's Consultant in accordance with Section 15.3(b);

(f) copies of all warranties and guarantees from Subcontractors; and

(g) all other documentation that is reasonably required by the Owner or by any party on behalf of the Owner to operate and maintain the Facility.

44.3 The Project Binder will be updated on a monthly basis with all documentation to Work completed up to the date is updated. The Design-Builder will provide and update 3 copies of the Project

Binder, and electronic files on 3 separate memory sticks/flashdrives, unless directed to use a different format by the Owner, acting reasonably.

44.4 Within 60 days after achieving Substantial Completion, the Design-Builder will provide to the Owner the following:

(a) 3 complete sets of paper print Record Drawings, signed and sealed by the Design-Builder's Consultant, showing the as-built Work and identified in bold letters with the words "CERTIFIED AS-BUILT"; and

(b) 1 complete copy of the Record Drawings on a memory stick/flashdrive in both BIM (Building Information Modelling) and Adobe PDF format acceptable to the Owner, acting reasonably.

45. CASH ALLOWANCES

45.1 This Section 45 applies only if cash allowances are stated in this Agreement.

45.2 The Contract Price includes cash allowances, if any, stated in this Agreement. The allowances will be expended, if at all, only as the Owner authorizes. The scope of work or costs included in such cash allowances will be as described in this Agreement.

45.3 Cash allowances cover the net cost to the Design-Builder of services (including design services), materials, products, construction machinery and equipment, freight, unloading, handling, storage, installation and other expenditures authorized by the Owner that are incurred in performing the work stipulated under the cash allowances but do not include GST payable by the Owner to the Design-Builder.

45.4 The Contract Price, and not the cash allowances, includes the Design-Builder's overhead and profit in connection with such cash allowances.

45.5 Where the actual costs expended by the Design-Builder for work under a cash allowance exceed the amount of the cash allowance, the Design-Builder will be compensated for any excess incurred and substantiated plus an amount for overhead and profit as set out in Section 48.2(b). Where the actual costs expended by the Design-Builder for work under a cash allowance is less than the amount of the cash allowance, the Owner will be credited for the unexpended portion of the cash allowance, but not for the Design-Builder's overhead and profit on such amount. Multiple cash allowances will not be combined for the purpose of calculating the foregoing.

45.6 The Contract Price will be adjusted to provide for any difference between the amount of each cash allowance and the actual cost of the work under that cash allowance.

45.7 The value of the Work performed under a cash allowance is eligible to be included in the monthly applications for payment.

45.8 The Design-Builder and the Owner will jointly prepare a schedule that shows when the Owner, through the Owner's Consultant, must authorize the ordering of items called for under cash allowances to avoid delaying the progress of the Work.

45.9 The Agreement includes a cash allowance of for those items identified as cash allowance items in Appendix 1J [Auditorium Specifications] of the Statement of Requirements.

PART E – CHANGES

46. CHANGES

46.1 The Owner, without invalidating this Agreement, may require Changes, with the Contract Price and Contract Time adjusted in accordance with Section 47. The Owner may issue any Change Order or Change Directive, which can include a stop Work order or resume Work order, to the Design-Builder's Representative or to any other person authorized by the Design-Builder to receive a Change Order.

46.2 No Change will be made without a Change Order or Change Directive from the Owner.

46.3 The Design-Builder will not be entitled to a Change Order or Change Directive, or to any adjustments to the Contract Price or the Contract Time, for any Change for which the Design-Builder has not, prior to commencing the performance of a Change, obtained from the Owner a Change Order or Change Directive except where expressly allowed in this Agreement at Sections 28.2 and 29.3.

46.4 The Owner may, at any time, require the Design-Builder to assess the impact of a proposed Change on the Contract Price and the Contract Time and the Design-Builder will provide the Owner with such assessment within 10 days after the Owner's request or such other time as may be agreed by the Owner, acting reasonably.

47. VALUATION AND CERTIFICATION OF CHANGES

47.1 The value of any Change will be determined by one or more of the following methods:

(a) by estimate and acceptance of a lump sum; or

(b) by unit prices or fee rates agreed upon (and which may include a maximum upset price).

47.2 The following process will be followed for Changes:

(a) where a Change is proposed or required by the Owner, the Design-Builder will promptly, and in any case within 10 days after the Change is proposed or required by the Owner, present to the Owner its claims for any adjustment to the Contract Price or the Contract Time that arise from the Change;

(b) where the Design-Builder claims a Change in Contract Price, the Design-Builder will provide a full breakdown of labour, material and other cost information;

(c) where the Owner and Design-Builder agree to the Change, including adjustments in the Contract Price and Contract Time, or to the method to be used to determine the adjustments, such Change will be effective when recorded in a Change Order; and

(d) the value of the Work performed as the result of a Change Order will be included in payment applications.

47.3 In the case of Changes to be paid for under Section 47.2(c), the form of presentation of costs and methods of measurement will be agreed to by the Owner and the Design-Builder before proceeding with the Change. The Design-Builder will keep accurate records of quantities or costs as agreed upon and will present an account of the costs of the Change, together with vouchers where applicable, at least once each month during performance of the Change, and will present a final account upon completion of the Change.

47.4 If the methods of valuation, measurement and value of any Change or any adjustment to the Contract Time cannot be promptly agreed upon, and in any case within 10 days after the proposed Change, and the Change is required by the Owner in writing to be proceeded with, then the Change will be performed by the Design-Builder and the value of the Change and adjustment to the Contract Time will be determined in accordance with the Dispute resolution process described in Section 62 by determining the cost of the Change in accordance with Section 48 (other than Sections 48.1 and 48.4) and by determining the adjustment of the Contract Time as a reasonable time taking into account the critical path.

47.5 It is intended in all matters involving Changes that both the Owner and the Design-Builder will act promptly and in accordance with the times set out in this Section 47.

48. DETERMINATION OF COST

48.1 Subject to Section 48.2 whenever it is necessary for the purposes of this Agreement to determine the cost of a Change, the cost will be the amount agreed upon by the Design-Builder and the Owner within a reasonable time after the issue arises in any given instance.

48.2 If the Design-Builder and the Owner cannot agree as to the cost of the Change as contemplated in Section 48.1, the sole cost to which the Design-Builder will be entitled for the Change will be equal to the aggregate of:

(a) all reasonable and proper amounts actually expended by or legally payable by the Design-Builder in respect of the labour, equipment or material (supported by invoices, purchase orders, timesheets and other customary industry documentation) that are directly attributable to the subject matter of the Change and that are within one of the classes of expenditures described in Section 48.3; plus

(b) to cover other costs, including overhead and profit, the following applicable markup on the amounts charged pursuant to Section 48.2(a).

(i) 5%, when the expenditure is a payment to a Subcontractor; or

(ii) 10% when the Design-Builder performed the Change.

48.3 Classes of expenditure that are allowable (all without additional markups except as otherwise noted in Section 48) for the purposes of Section 48.2 are:

(a) payments to Subcontractors, including a maximum aggregate markup of 10% on the direct labour, equipment and material costs of the Subcontractors who directly perform the Change;

(b) wages, salaries and reasonable and traveling expenses of employees of the Design-Builder while they are actually and properly engaged on the Work, other than wages, salaries, bonuses, reasonable living and travelling expenses of personnel of the Design-Builder generally employed at the head office, or at a general office, of the Design-Builder unless such personnel is engaged at the site of the Work, with the approval of the Owner;

(c) payments for materials necessary for and incorporated in the Work or necessary for and consumed in the performance of the Work;

(d) payment for equipment necessary for and incorporated in the Work;

(e) payments for tools, other than tools customarily provided by tradespersons, necessary for and used in the performance of the Work;

(f) payments for preparation, inspection, delivery, installation, commissioning and removal of equipment and materials necessary for the performance of the Work;

(g) assessments payable under any statutory scheme relating to workers compensation, unemployment insurance or holidays with pay;

(h) payments for renting equipment (but not tools) and allowances for equipment (but not tools) owned by the Design-Builder, necessary for the performance of the Work, provided that such payments or allowances are reasonable or have been agreed to by the Design-Builder and the Owner; and

(i) other payments, made with the prior approval of the Owner, that are necessary for the performance of the Work, as determined by the Owner.

48.4 If the Design-Builder and the Owner cannot agree as to the cost of labour, equipment or material as contemplated in Section 48.1, and the Owner considers that a Change or series of related Changes may exceed $50,000, the Owner may require the Design-Builder, and the Design-Builder will, obtain a minimum of 3 competitive quotations or tenders for all or any part of such Change or Changes as directed by the Owner.

48.5 The applicable markup set out in this Section 48 will apply to any credit to the Owner for reductions in the costs relating to a Change. Where both increases and reductions in costs relate to a Change, the applicable markup will apply to the net increase or reduction in costs.

49. CHANGE DIRECTIVE

49.1 The Owner may issue a Change Directive to the Design-Builder directing the Design-Builder to proceed with a Change. The Design-Builder will proceed with the Change and the valuation and adjustments to the Contract Price and the Contract Time will be made as soon as reasonably possible after the implementation of the Change in the same manner as a Change for which a Change Order would be issued under this Agreement.

49.2 The Owner may issue Change Directives at any time, including prior to commencing the process for a Change Order or if there is a Dispute in relation to a Change or Change Order (including a Dispute as to whether there is a Change).

PART F – DELAYS

50. DELAYS

50.1 If the Design-Builder is delayed in performing the Work as a direct result of a failure of the Owner to provide access to the Site, or a material breach by the Owner of the terms of this Agreement or by an order issued on or after the Financial Submission Date by any court or public authority having jurisdiction (providing such order was not issued as the result of any act or fault of the Design-Builder or a Subcontractor), or the events referred to in Sections 27.4, 28.2, 29.3 or 63.3(d)(iii), then:

(a) the Contract Time will be extended for such reasonable time, taking into account the critical path as agreed by the Owner and the Design-Builder, acting reasonably, and the Design-Builder will be reimbursed for any costs directly incurred by it as the result of such delay, determined in accordance with Section 48; or

(b) if the Owner determines that the Target Substantial Completion Date can still be met and requests in writing that the Design-Builder accelerate the Work, the Design-Builder will accelerate its efforts to meet the Target Substantial Completion Date as directed by the

Owner. The Design-Builder will be reimbursed for all reasonable and direct costs plus the markup set out in Section 48.2(b) incurred by it as a result of undertaking such acceleration efforts.

50.2 If the Design-Builder is delayed in performing the Work by an event of Force Majeure then:

(a) the Contract Time will be extended for such reasonable time taking into account the critical path, as agreed by the Owner, and the Design-Builder acting reasonably; or

(b) if the Owner determines that the Target Substantial Completion Date can still be met and requests in writing that the Design-Builder accelerate the Work, the Design-Builder will accelerate its efforts to meet the Target Substantial Completion Date as directed by the Owner. The Design-Builder will be reimbursed for all reasonable and direct costs plus the markup set out in Section 48.2(b) incurred by it as a result of undertaking such acceleration efforts.

Except as provided in Section 50.2(b) for acceleration of the Work required by the Owner, the Design-Builder will not be entitled to any costs incurred in relation to the Force Majeure or delays arising from the Force Majeure.

50.3 If the Design-Builder is delayed in the performance of the Work for any reason other than that for which an extension of time is permitted under this Section 50 or if the Design-Builder does not perform the Work substantially in accordance with the Time Schedule to meet the Target Substantial Completion Date, the Design-Builder will at its cost accelerate the Work to meet the Target Substantial Completion Date.

50.4 The Design-Builder is not entitled to any extension of time or any reimbursement of costs for delay under this Section 50 unless written notice is given to the Owner not later than 7 days after the date that the Design-Builder becomes aware of the event causing the delay. In the case of a continuing cause of delay only one notice is necessary. The notice will include the reason for the delay, the justification under this Agreement for the claim and an estimated value for the claim including all impacts of the delay and all steps taken or reasonably available to mitigate the delay and impact. The Design-Builder will provide a full, detailed, and organized account of the delay and amount claimed, including any supporting information or documentation, as required by the Owner, the Owner's Consultant or the Payment Certifier, before any delays or impacts will be considered. The information and documentation must be presented promptly to the Owner, and in any event, no later than 30 days or such later date as the parties may agree, after the date on which the Design-Builder delivered notice, and in the event of a continuing delay such information and documentation must be updated every 30 days. No such account or update will be deemed to extend the time for delivery of notice, or revive a claim that has been waived. The Design-Builder waives any claim for extension of Contract Time or adjustment to the Contract Price, or any other compensation, expenses, loss or damages incurred as the result of a delay unless the Design-Builder provides such notice of the delay within the time period specified and provides the account of the delay and amount claimed and all required updates within the time periods specified.

50.5 In the case of any delay under Section 50.1 or Section 50.2 the Design-Builder will use all reasonable efforts to mitigate the costs and impacts of the delay including removing the cause of the delay as promptly as practicable such that the Time Schedule is maintained and that acceleration efforts, if requested by the Owner, are minimized.

PART G – SUSPENSION AND TERMINATION

51. NON-DEFAULT SUSPENSION/TERMINATION

51.1 Notwithstanding that the Design-Builder may not be in default of the terms of this Agreement, if conditions arise which in the Owner's reasonable opinion make it necessary, the Owner may suspend performance of the Work or terminate this Agreement by giving 5 days' written notice to that effect to the Design-Builder and the suspension or termination is effective in the manner specified in the notice.

51.2 Without limiting Section 51.1, the Owner may, if it determines that there is an emergency, by notice to the Design-Builder, do either or both of the following:

(a) suspend the Work whenever in its opinion such suspension may be necessary to ensure the safety or life of others or of the Work or neighbouring property; or

(b) make Changes, and order, assess and award the cost of such Changes that are extra to the Contract Price in accordance with Section 47 and Section 48 as determined to be necessary.

51.3 The Owner will within 2 Business Days after a Change under Section 51.2(b) confirm in writing any Change instructions and if a Change has been performed by order of the Owner, the Design-Builder retains its right to claim the value of such Change.

51.4 The Design-Builder upon receiving notice of suspension or termination from the Owner will immediately suspend all operations except those, which, in the Design-Builder's reasonable opinion, are necessary to ensure the safety of personnel and the public or for the care and preservation of the Work and materials. Subject to any directions in the notice of suspension or termination, the Design-Builder will discontinue ordering materials, will not enter into any further Subcontracts (except such Subcontracts as are necessary for the safety of personnel or for the care and preservation of the Work) and will make every reasonable effort in the event of termination to cancel existing Subcontracts and orders on the best terms available.

51.5 During the period of suspension the Design-Builder will not remove from the Site any of the Work, or any material, without the prior written consent of the Owner.

51.6 If the period of suspension is 30 days or less, the Design-Builder, upon the expiration of the period of suspension, will resume the performance of the Work and will be paid for all costs reasonably incurred by the Design-Builder in complying with the suspension, determined in accordance with Section 48 and for costs reasonably incurred for acceleration of the Work so that Substantial Completion is achieved by the Target Substantial Completion Date where the Owner requires such acceleration by written notice to the Design-Builder. If the Owner does not require the acceleration of the Work, or if it is not possible for the Design-Builder, using all reasonable efforts, to achieve Substantial Completion by the Target Substantial Completion Date despite an intended acceleration of the Work, the Owner and the Design-Builder will, acting reasonably, agree on a new Target Substantial Completion Date.

51.7 If the period of suspension is greater than 30 days and, before 120 days after the date of the notice of suspension, the Owner and the Design-Builder agree to continue with and complete the Work, the Design-Builder will resume operations and complete the Work in accordance with any terms and conditions agreed upon by the Owner and the Design-Builder and the Design-Builder will be paid for all costs reasonably incurred by the Design-Builder in complying with the suspension, determined in accordance with Section 48.

51.8 If the period of suspension is greater than 30 days and the Owner and the Design-Builder do not agree to continue with and complete the Work, or they fail to agree on the terms and conditions upon which the Design-Builder is to resume operations and complete the Work, before 120 days after the date of the notice of suspension, this Agreement will be deemed to have been terminated.

51.9 If this Agreement is terminated pursuant to this Section 51:

(a) the Owner will pay the Design-Builder:

(i) in accordance with this Agreement, for all Work performed and for all of the Design-Builder's obligations under Subcontracts that it was unable to cancel, or asked by the Owner not to cancel, less any payments made by the Owner prior to termination; and

(ii) all costs reasonably incurred by the Design-Builder in complying with the suspension or termination order, determined in accordance with Section 48, less any costs already paid to the Design-Builder pursuant to Section 51.6; and

(b) the Owner will be entitled to:

(i) take possession of the Work or any part of the Work;

(ii) take possession of the Drawings and Specifications and make use of them in accordance with the rights granted under this Agreement; and

(iii) finish the Work or any part of the Work by whatever reasonable method the Owner may consider expedient.

51.10 The Design-Builder's obligations as to quality, correction and warranty of any portion of the Work performed prior to termination continue in force after termination under this Section 51.

51.11 The Design-Builder, by giving written notice to the Owner, may suspend performance of the Work to the extent the Work is stopped for a period in excess of 30 days by an order of any court or public authority having jurisdiction through no act or fault of the Design-Builder or of anyone employed by it.

52. DEFAULT AND TERMINATION OF AGREEMENT

52.1 The Owner may give written notice to the Design-Builder of default under this Agreement if the Design-Builder:

(a) is adjudged bankrupt, makes a general assignment for the benefit of creditors, or a receiver is appointed on account of its insolvency, or fails to make payment to creditors when payment is due;

(b) abandons the Work;

(c) breaches a material term of this Agreement;

(d) makes a material misrepresentation of a representation or warranty set out in this Agreement;

(e) has delivered a statutory declaration in support of application for a payment under this Agreement that was false or materially inaccurate; or

(f) has made an assignment of this Agreement without the required consent of the Owner.

52.2 If a default referred to in Section 52.1 occurs, other than a default referred to in Section 52.1(a) or 52.1(b), the Design-Builder will remedy the default within a 7 day rectification period after the notice given under Section 52.1. If the nature of such default is that it cannot be remedied within such 7 day period, the Design-Builder will within such 7 day period provide the Owner with a schedule acceptable to the Owner for remedying the default and the Design-Builder will remedy the default in accordance with that schedule.

52.3 If a default referred to in Section 52.1(a) or 52.1(b) occurs or if the Design-Builder fails to remedy any other default within the rectification period described in Section 52.2 or in accordance with the schedule acceptable to the Owner, the Owner may without prejudice to any other right or remedy exercise any or all of the following:

(a) suspend all or part of the Work;

(b) terminate the Design-Builder's right to continue with the Work in whole or in part;

(c) remedy the default and deduct the cost thereof from any payment then or thereafter due to the Design-Builder; and

(d) terminate this Agreement.

52.4 If the Owner terminates the right to continue with all or part of the Work or terminates this Agreement pursuant to Section 52.3, the Owner will be entitled to:

(a) take possession of the Work or any part of the Work;

(b) take possession of the Drawings and Specifications and make use of them in accordance with the rights granted under this Agreement;

(c) use construction machinery and equipment, subject to the rights of third parties;

(d) finish the Work or any part of the Work by whatever reasonable method the Owner may consider expedient;

(e) charge the Design-Builder the amount by which the full cost of finishing the Work and a reasonable allowance to cover the cost of corrections to Work performed by the Design-Builder that may be required under Section 37 exceeds the unpaid balance of the Contract Price; and

(f) on expiry of the Warranty Period, charge the Design-Builder the amount by which the cost of corrections to Work under Section 37 exceeds the allowance provided for such corrections, or reimburse the Design-Builder with the portion of the allowance unspent on the cost of corrections to the Work under Section 38 as applicable.

52.5 The termination of the right to continue with part of the Work does not relieve or discharge the Design-Builder from any obligations under this Agreement, except the obligation to perform the part of the Work removed from the Design-Builder.

52.6 The rights, powers and remedies conferred on the Owner under this Agreement are not intended to be exclusive but are cumulative, are in addition to, do not limit and are not in substitution for any other right, power and remedy existing under this Agreement, under any other agreement, at law or in equity. The exercise by the Owner of any right, power or remedy does not preclude the simultaneous or later exercise by the Owner of any other right, power or remedy.

53. TERMINATION BY THE DESIGN BUILDER

53.1 The Design-Builder may by giving written notice to the Owner declare the Owner in default of this Agreement for any of the following reasons:

(a) the Owner has failed to pay the Design-Builder within 45 days of the date that any payment becomes due to the Design-Builder in accordance with the terms of this Agreement, unless the Owner is bona fide disputing liability to make such payment and has provided notice to the Design-Builder of the basis for its dispute before the time provided in Section 39.10 for payment of invoices;

(b) the Owner has failed to substantially supply the Site to the Design-Builder, subject to any property availability restrictions identified in this Agreement, within 180 days following the Site Occupation Date; or

(c) substantially all of the Work is stopped by an order of any court or public authority having jurisdiction (providing that such order was not issued as the result of any act or fault of the Design-Builder or a Subcontractor) for a period of 90 days.

53.2 If a default referred to in Section 53.1 occurs, the Owner will remedy the default within a 21 day rectification period after the notice given under Section 53.1 or within such extension thereof established by the Design-Builder.

53.3 If the Owner fails to remedy the default within the rectification period described in Section 53.2 or any extension thereof established in accordance with that Section, the Design-Builder may exercise any or all of the following:

(a) waive the default;

(b) further extend the rectification period;

(c) suspend the Work; and

(d) terminate this Agreement.

53.4 If the Design-Builder terminates this Agreement in accordance with Section 53.3(d), the Design-Builder is entitled to be paid:

(a) in accordance with the terms of this Agreement for all Work satisfactorily performed to the date of termination; and

(b) expenses of the Design-Builder that are directly related to the termination and reasonable in the circumstances including the Design-Builder's obligations to other parties.

PART H – REPRESENTATIONS AND WARRANTIES

54. REPRESENTATIONS AND WARRANTIES

54.1 The Design-Builder represents and warrants to the Owner:

(a) as of the Effective Date that:

(i) all necessary proceedings have been taken to authorize the Design-Builder to enter into this Agreement and to execute and deliver this Agreement;

(ii) this Agreement has been properly executed by an authorized signatory of the Design-Builder and is enforceable against the Design-Builder in accordance with its terms;

(iii) the Design-Builder has had sufficient time, opportunity and resources to investigate and has investigated and satisfied itself of every condition and risk relating to, affecting or that may affect the Project and the Work, or either of them, including the Site conditions, and the labour, equipment, material and other resources that may be necessary for the performance of the Work in a manner that will meet or exceed all requirements of this Agreement;

(iv) the Design-Builder's investigations and assessments described in Section 54.1(a)(iii), including of the Site conditions (such conditions including for greater certainty geotechnical conditions, subsurface conditions, bearing pressure, settlement characteristics and nature and consistency of soil), and any conclusions reached in such investigations and assessments, including any conclusions as to the effect, if any, on the Design, Construction, Substantial Completion Date and Contract Price, (or any of them), except for objective geotechnical information that can be relied upon for accuracy but not interpretation, sufficiency or relevance, are based on the Design-Builder's own experience, examination, knowledge, information, interpretation, assessment, analysis and judgment and not upon any statement, representation or information, whether oral or written, made, produced or provided by, through or on behalf of the Owner or its advisors;

(v) subject to Section 27.1 in respect of the accuracy of objective geotechnical data identified in Section 27.1(c), the Design-Builder acknowledges that the investigations made by the Owner of the conditions of the Site, including subsurface conditions, are of a preliminary nature and are made for the purpose of study and preliminary design for the sole benefit of the Owner only except for objective geotechnical data that can be relied upon by the Design-Builder for accuracy but not interpretation, sufficiency or relevance;

(vi) the Design-Builder has no knowledge of any fact that materially adversely affects or, so far as it can foresee, might materially adversely affect either its financial condition or its ability to fulfill its obligations under this Agreement;

(vii) there is no bona fide proceeding pending or threatened against the Design-Builder, which would, if successful, materially adversely affect the ability of the Design-Builder to fulfill its obligations under this Agreement;

(viii) the Design-Builder acknowledges that it has the responsibility for informing itself of all aspects of the Project and all information necessary to perform the Work; and

(ix) the Design-Builder acknowledges that the Work has not yet been impacted by any Force Majeure or change to applicable Laws or Standards and that, also as of the Effective Date, the Design-Builder has not yet incurred any additional costs nor been delayed as a result of any Force Majeure or change to applicable Laws or Standards; and

(b) as of the Effective Date (to the extent applicable as of the Effective Date) and at all times throughout the Term that:

(i) the Design-Builder has filed all tax, corporate information and other returns required to be filed by all applicable Laws, has complied with all workers' compensation legislation and other similar legislation to which it is subject, and has paid all taxes, fees and assessments due by the Design-Builder under those laws as of the Effective Date, except for Lien Holdback monies properly retained, payments deferred by agreement and accounts withheld by reason of legitimate dispute;

(ii) the Design-Builder holds all permits, licences, consents and authorities issued by any level of government, or any agency of any level of government, that are required by all applicable Laws to perform the Work;

(iii) the Design-Builder has paid, as they became due, all accounts, expenses, wages, salaries, taxes, rates, fees and assessments required to be paid by it in respect of the Work and fulfillment of its obligations under this Agreement;

(iv) the Design-Builder is not in breach of any Law that is material to performance of the Design-Builder's obligations under this Agreement;

(v) the Key Individuals or any substitute with equivalent qualifications proposed by the Design-Builder who have first been expressly accepted in writing by the Owner will be available and fully involved in the performance of the Work; and

(vi) the Design-Builder is registered for the purposes of the GST.

54.2 The Owner represents and warrants to the Design-Builder as of the Effective Date that:

(a) it has been properly constituted pursuant to applicable legislation;

(b) it has been properly authorized to fulfill the obligations of the Owner under this Agreement; and

(c) it has the power, capacity and authority to enter into this Agreement and to carry out its obligations under this Agreement.

PART I – PROTECTION AND INDEMNITY

55. PROTECTION OF WORK AND PROPERTY

55.1 The Design-Builder will protect the Work, the Site and property adjacent to the Site from damage that may arise as the result of the Design-Builder's operations under this Agreement, and will be responsible for such damage, except damage that occurs as the result of actions of the Owner, its agents, employees or Other Contractors.

55.2 Should any damage occur to the Work, the Site and property adjacent to the Site for which the Design-Builder is responsible as provided in Section 55.1, the Design-Builder will make good such damage at its own expense or pay all costs incurred by the Owner or others in making good such damage.

55.3 Should any damage occur to the Work, the Site and property adjacent to the Site for which the Design-Builder is not responsible as provided in Section 55.1, the Design-Builder will at the Owner's direction and expense make good such damage. The Contract Price and Contract Time will be adjusted in accordance with Section 47 and Section 48.

56. EXCLUSIONS OF LIABILITY

56.1 Neither the Design-Builder nor the Owner will be liable to the other for any consequential or indirect damages in connection with this Agreement, whether based in contract, tort (including negligence), strict liability or otherwise and including loss of use, loss of revenues or profits and loss of opportunity. This Section 56.1 will not limit any liability the Design-Builder may have under this Agreement to pay liquidated damages.

56.2 Subject to Section 56.3 the maximum amount of the total aggregate liability of the Design-Builder to the Owner in connection with this Agreement, whether based in contract, tort (including negligence), strict liability or otherwise, is:

(a) in respect of a loss by the Indemnified Parties for which insurance is to be provided by the Owner under Section 1 or Section 3 of Schedule 3 - Insurance Conditions, the applicable limit or sub-limit of the Wrap-up Liability coverage or the Course of Construction coverage, whichever is applicable to the loss, with such limit or sub-limit calculated without reduction for the amount of any deductible; or

(b) in respect of any liability other than a loss referred to in Section 56.2(a) above, 50% of the Contract Price.

If this Agreement is terminated, the reference in this Section 56.2 to the "**Contract Price**" will be deemed only for purposes of this Section 56.2 to be the amount to which the Design-Builder would have been entitled if the Design-Builder had properly performed and completed the Work and this Agreement had not been terminated.

56.3 Section 56.2 will not limit the Design-Builder's liability in connection with:

(a) fraud, gross negligence or wilful, fraudulent or criminal misconduct;

(b) bodily injury, sickness, disease or death;

(c) liability to third parties in respect of tangible personal or real property;

(d) breach by the Design-Builder of its obligations of confidentiality under this Agreement; and

(e) penalties, fines or other liability imposed by a governmental authority, an administrative tribunal or a court of competent jurisdiction for breach of applicable Law.

56.4 Nothing in this Section 56 will be construed to limit the liability of an insurer under the insurance required to be maintained under this Agreement.

57. INDEMNIFICATION

57.1 The Design-Builder will indemnify and save harmless the Owner and the City of Vancouver and their respective officers, employees, representatives, consultants and agents including the Owner's Representative (collectively the "**Indemnified Parties**") from and against any and all losses, claims, damages, actions, causes of action, costs and expenses (including actual legal and other professional fees and disbursements) that any of the Indemnified Parties may sustain, incur, suffer or be put to at any time either before or after the expiration or termination of this Agreement, where the same or any of them are based upon, arise out of or occur, directly or indirectly, by reason of any act or omission of the Design-Builder or of any representative, agent, employee, officer, director, consultant of the Design-Builder or of any Subcontractor, excepting only liability to the extent arising out of the independent acts of the Indemnified Parties.

57.2 The obligations of the Design-Builder under Section 57 will not be affected by completion or termination of this Agreement, whether for default or otherwise, or suspension of the Work or any withdrawal of services or labour from the Project.

57.3 Neither the requirement of the Design-Builder to purchase and maintain insurance as described in the Insurance Conditions nor the acceptance of evidence of such insurance by the Owner will, in any manner, limit or qualify the right of the Owner to make a claim and recover insurance proceeds under the insurance policies described in the Insurance Conditions or the liability and obligations otherwise assumed by the Design-Builder under this Agreement.

58. DESIGN BUILDER'S DISCHARGE OF LIABILITY

58.1 The Design-Builder will discharge all liabilities incurred by it, including for labour, equipment, materials or services used or reasonably required for use, in the performance of this Agreement, on or before the date each becomes due. In the case of bona fide disputed payments, the Design-Builder will discharge such liabilities when legally obliged to do so.

58.2 The Design-Builder will include as a condition of every Subcontract that the Subcontractor discharge all liabilities incurred by it, including for labour, equipment, materials, supplies or services used or reasonably required for use, in the performance of the Subcontract, on or before the date upon which each becomes due. In the case of bona fide disputed payments, the Design-Builder will discharge such liabilities when legally obliged to do so.

58.3 The Design-Builder will furnish the Owner with satisfactory evidence that its liabilities and those of Subcontractors have been discharged, such satisfactory evidence to be a statutory declaration in the form of CCDC 9A sworn by a knowledgeable officer or senior management employee of the Design-Builder or Subcontractor, as the case may be, or such other evidence as the Owner may require.

58.4 With the exception of any claim of builder's lien, builder's liens or certificates of pending litigation that arise due to an improper non-payment by the Owner, the Design-Builder will not directly or indirectly create, incur, assume or allow to be created by any of its Subcontractors or workers any lien, charge or encumbrance on the Site, Project or any part thereof or interest therein. The Design-Builder will immediately notify the Owner of any lien, charge or encumbrance asserted upon the Site, Project or any part thereof.

PART J - SECURITY, RECORDS, REPORTS AND AUDIT

59. BONDS

59.1 Before commencing the Work, the Design-Builder will purchase and deliver to the Owner an executed performance bond and an executed labour and materials payment bond (the "**Bonds**"). The form of the Bonds will be in accordance with the latest edition of the CCDC approved bond form or in substantially equivalent form acceptable to the Owner.

59.2 Each Bond under Section 59.1 will be in the amount of 50% of the Contract Price and will be issued by a surety licensed to transact the business of a surety in British Columbia and acceptable to the Owner, acting reasonably.

59.3 Upon entering into a Subcontract with a Subcontractor, the Design-Builder will advise the Subcontractor that a labour and materials payment Bond is in effect and will supply a copy of that Bond to the Subcontractor on request.

59.4 The Design-Builder will pay for and maintain the Bonds in force during the Term.

59.5 If the surety notifies either party that the Bonds are or are going to be terminated or cancelled for any reason whatsoever, the Design-Builder will obtain and provide the Owner with valid bonds effective from the date of termination or cancellation of the original bonds that comply with the bonding requirements of this Agreement.

59.6 The Design-Builder will, if required by the surety, obtain the written consent of the surety to any Change and will upon request by the Owner provide confirmation from the surety of such consent or confirmation from the surety that such consent is not required.

59.7 For greater certainty, the amount of the Bonds and any claim under the Bonds will not limit the Owner from seeking additional claims, damages, or remedies the Owner may be entitled to by reason of the Design-Builder's failure to successfully complete the Agreement in accordance with its terms and conditions.

60. INSURANCE

60.1 The Owner and the Design-Builder will obtain and maintain during the Term the insurance specified for each of them under the Insurance Conditions, and will otherwise comply with the Insurance Conditions.

60.2 Before beginning the Work, the Design-Builder will deliver to the Owner certified copies of all insurance coverage obtained by the Design-Builder in accordance with the Insurance Conditions, or such other proof of that insurance as is satisfactory to the Owner, acting reasonably.

61. RECORDS AND AUDIT

61.1 The Design-Builder will, in connection with this Agreement retain for a minimum of 6 years after the expiry of the Warranty Period all records, reports, and other documentation required under this Agreement and the following records, reports and other documentation relating to the Project whether or not required under other provisions of this Agreement:

(a) all documents relating to permits;

(b) all notices, reports, results and certificates relating to completion of the Design and Construction and completion of all commissioning activities;

(c) all records relating to any inspections of the Facility conducted under applicable Laws or by or of any governmental authority;

(d) all orders or other requirements issued to the Design-Builder by any governmental authority in connection with the Work;

(e) all documents relating to applications for payment, Changes or delay or other claims by the Design-Builder.

The Design-Builder will permit the Owner and its consultants and representatives to inspect and copy any or all such records, reports and other documentation.

61.2 Without limiting the other provisions of this Agreement, the Design-Builder will provide to the Owner and its consultants and representatives all records, reports and other documentation reasonably required by the Owner to support any applications for payment, Changes or delay or other claims by the Design-Builder.

61.3 The Owner and its consultants and representatives may on request, and acting reasonably, audit all books and records of the Design-Builder that relate to any applications for payment, Changes or delay or Disputes or other claims by the Design-Builder.

61.4 The Design-Builder will fully cooperate with the Owner to conduct an audit pursuant to this Section 61.

PART K - DISPUTE RESOLUTION

62. DISPUTE RESOLUTION

62.1 All Disputes will be resolved in accordance with the Dispute resolution process set out in this Section 62.

62.2 The Dispute resolution process set out in this Section 62 may be commenced by either party by giving notice to the other party briefly setting out the pertinent facts, the remedy or relief sought and the grounds on which such remedy or relief is sought.

62.3 Within 7 days of a notice under Section 62.2, the Design-Builder's Representative and the Owner's Representative will:

(a) make bona fide efforts to resolve any Dispute arising between them by amicable negotiations; and

(b) provide frank, candid and timely disclosure of all relevant facts, information and documents, including full written particulars of the nature, entitlement and magnitude of any Dispute including the relevant provisions of this Agreement.

62.4 If the Owner's Representative and the Design-Builder's Representative fail to resolve the Dispute within 10 days after receipt of the notice pursuant to Section 62.3, the parties will refer the Dispute and all information to a nominated senior officer of the Owner and a nominated senior officer of the Design-Builder for resolution.

62.5 If the nominated senior officer of the Owner and the nominated senior officer of the Design-Builder fail to resolve the Dispute within 10 days after the Dispute has been referred to them, unless otherwise agreed in writing by the parties, either party may refer the Dispute to the Owner's Consultant by notice in writing to both the Owner's Consultant and to the other party. The Owner will require the Owner's Consultant to give a decision in writing and within a reasonable period of time. Both parties reserve their rights to dispute the decision of the Owner's Consultant.

62.6 Where either or both parties dispute the Owner's Consultant's decision made pursuant to Section 62.5, the parties will abide by the Owner's Consultant's decision until such time as the Dispute is finally resolved under the other provisions of this Section 62.

62.7 If either party disputes the Owner's Consultant's decision made pursuant to Section 62.5, or if the Owner's Consultant's decision is not made within a reasonable period of time, either party may elect to give notice of its intention to submit the Dispute to binding arbitration. If within 10 days of such notice the other party does not give a notice of objection to arbitration, the Dispute will be resolved by arbitration. The Dispute will be referred to a single arbitrator and finally resolved by binding arbitration under the rules of the British Columbia International Commercial Arbitration Centre. The arbitrator will be chosen by mutual agreement between the Design-Builder and the Owner. If an arbitrator has not been appointed within 14 days of the date that the Dispute has been referred to an arbitrator, the arbitrator will be appointed by the British Columbia International Commercial Arbitration Centre.

62.8 Prior to receiving a notice of intention to submit a Dispute to binding arbitration or after giving a notice of objection to arbitration in accordance with Section 62.7 a party may commence proceedings in respect of the Dispute in the courts of British Columbia and serve the other party as required in respect of such proceedings.

62.9 Any of the times specified in this Section 62 may be varied by mutual agreement between the Design-Builder's Representative and the Owner's Representative.

62.10 Pursuit of the resolution of a Dispute under any part of this Section 62 does not relieve either party of its responsibility to ensure timely performance of its obligations under this Agreement. In relation to all Disputes, whether or not a notice under Section 62.2 has been given, the Design-Builder will diligently proceed with the Work and closely track all costs and impacts associated with the Dispute and may reserve its rights concerning the Dispute.

PART L - GENERAL PROVISIONS

63. LAWS, NOTICE, PERMITS AND FEES

63.1 The Design-Builder will perform the Work in accordance with all applicable Laws and Standards and will comply with all Laws and Standards that may affect or relate to the Work.

63.2 The Design-Builder will apply for, pay for and obtain a building permit, occupancy permit and all other permits, licences and approvals required for the performance of the Work. The Design-Builder will apply for and obtain a development permit but the Owner will be responsible for paying the cost of the development permit application. When requested to do so by the Design-Builder, the Owner may at its discretion provide reasonable assistance to the Design-Builder in obtaining permits, licences, and approval required for the performance of the Work but, in no circumstance will the Owner be required to incur any costs or make any payments pursuant to this Section.

63.3 The Owner anticipates that the Design-Builder will be required by the City of Vancouver to perform certain off-Site Work as part of the City of Vancouver's permitting, licensing and approval process. Such anticipated off-Site Work is described in Sections 3.9.3.1(1), 3.9.3.1(2), 4.8.1, 4.12.2.1(5)(e), 4.12.2.1(27), 5.4.1.1(3), 5.4.2.1(2), 5.4.3.1(2), 5.4.4.1(5) and 5.4.5.1(5) of the Statement of Requirements. If the City of Vancouver requires the Design-Builder to perform off-Site Work beyond what is described in these sections in the Statement of Requirements, then, notwithstanding Section 63.2, the following will apply:

(a) promptly upon becoming aware of the requirement to perform the additional off-Site Work, the Design-Builder will provide the Owner with notice and such reasonable details regarding the additional off-Site Work as are available;

(b) the Owner will either:

(i) issue a notice to the Design-Builder to proceed with such additional off-Site Work (an "**Off-Site Work Notice**"); or

(ii) issue a notice to the Design-Builder stating that the City of Vancouver no longer requires such additional off-Site Work (a "**City Resolution Notice**");

(c) the Design-Builder will not proceed with any additional off-Site Work without first receiving an Off-Site Work Notice; and

(d) if the Owner issues:

(i) a City Resolution Notice, then the Design-Builder will not be entitled to an adjustment to the Contract Price or the Contract Time;

(ii) an Off-Site Work Notice on or before 180 days from the Owner's receipt of the notice under Section 63.3(a), then the Design-Builder will proceed with the additional off-Site Work and will be entitled to an adjustment to the Contract Price to the extent the Design-Builder incurs additional costs but the Design-Builder will not be entitled to an adjustment to the Contract Time; or

(iii) an Off-Site Work Notice after 180 days from the Owner's receipt of the notice under Section 63.3(a), then the Design-Builder will proceed with the additional off-Site Work and the Design-Builder's entitlement to an extension of the Contract Time and reimbursement of costs will be determined in accordance with Section 50.

63.4 All applicable Laws in force in British Columbia, as amended from time to time, govern the Work.

63.5 Except as otherwise provided in this Agreement, if on or after the Financial Submission Date a change to applicable Laws and Standards comes into effect, either party will be entitled to make a claim for an adjustment in the Contract Price and the Contract Time as a Change.

64. INTELLECTUAL PROPERTY FEES

64.1 The Design-Builder will obtain and pay for all intellectual property rights (including of any patent, copyright, industrial design, trademark or trade secret) all royalties and licence fees required for the performance of the Work and will, without limiting Section 57, indemnify and hold the Owner harmless from and against all claims, demands, losses, costs, damages, actions, suits or proceedings arising out of the Design-Builder's performance of the Work under this Agreement that are attributable to infringement or an alleged infringement of any intellectual property right by the Design-Builder or its Subcontractors or anyone for whose acts the Design-Builder may be liable.

65. CONFIDENTIALITY AND COMMUNICATIONS

65.1 Subject to Section 65.2, each party will hold in confidence any Confidential Information received from the other party, except that this Section 65 will not restrict:

(a) the Design-Builder from disclosing or granting access to such information to its professional advisers and consultants, to the extent necessary, to enable it to perform (or to cause to be performed) or to enforce its rights or obligations under this Agreement and provided further that the Design-Builder may, subject to obtaining confidentiality restrictions similar to those set out in this Agreement, provide to a Subcontractor and its advisors, or provide or cause to be provided to other third parties, Confidential Information which is necessary to enable the Design-Builder to perform (or to cause to be performed) its obligations under this Agreement; and

(b) the Owner from disclosing or granting access to such information to any provincial ministry, Partnerships British Columbia Inc. and any other governmental authority, including the City of Vancouver, which require the information in relation to the Project.

65.2 Subject to any restrictions on the Confidential Information which are imposed by a third party that may own any Confidential Information, the obligation to maintain the confidentiality of the Confidential Information does not apply to:

(a) Confidential Information which the party that disclosed the Confidential Information confirms in writing is not required to be treated as Confidential Information;

(b) Confidential Information which is or comes into the public domain otherwise than through any disclosure prohibited by this Agreement;

(c) Confidential Information to the extent any person is required to disclose such Confidential Information by Law, including a disclosure required under FIPPA;

(d) Confidential Information to the extent consistent with any Owner's policy concerning the Owner's Confidential Information, the details of which have been provided to the Design-Builder in writing prior to the disclosure; or

(e) the material referred to in Section 17.5 and any Confidential Information that the Owner is entitled to receive from the Design-Builder pursuant to this Agreement.

65.3 Without prejudice to any other rights and remedies that the other party may have, each of the parties agrees that damages may not be an adequate remedy for a breach of Section 65.1 and that the other party will, in such case, be entitled to the remedies of injunction, specific performance or other equitable relief for any threatened or actual breach of Section 65.1 subject, in the case of a claim for any such remedy against the Owner, to the provisions of the *Crown Proceeding Act* (British Columbia).

65.4 Unless required by any Law, neither party will make or permit to be made any public announcement or disclosure whether for publication in the press, radio, television or any other medium of any Confidential Information, without the consent of the other party (which will not be unreasonably withheld or delayed).

65.5 Except to the extent required for compliance with any applicable securities laws, the Design-Builder will not make any public announcement relating to the Project or this Agreement without the prior written consent of the Owner. The Design-Builder, with the prior written consent of the Owner, may include the Project in its promotional materials.

65.6 The Design-Builder acknowledges that the Owner may, in its discretion and without consultation with the Design-Builder, make any public announcement relating to the Project.

65.7 The parties will comply with Schedule 4 – Communication Roles.

66. NOTICE

66.1 Any notice or communication required or permitted to be given under this Agreement will be in writing and will be considered to have been sufficiently given if delivered by hand or transmitted by electronic transmission to the address or electronic mail address of each party set out below:

(a) if to the Owner:

Vancouver School Board
1580 West Broadway
Vancouver BC V6J 5K8

Attention: Saniye Karacabeyli

Email: skaracabeyli@vsb.bc.ca

(b) if to the Design-Builder:

Bird Design-Build Construction Inc.
Unit 2370 – Building 2000
6900 Graybar Road
Richmond BC V6W 0A5

Attention: Denis Craddock

Email: Denis.Craddock@bird.ca

With copies to:

Attention: Dom Costantini, Vice President & District Manager – British Columbia

Email: Dom.Costantini@bird.ca

Attention: Charles Caza, Senior Vice President

Email: Charles.Caza@bird.ca

or to such other address or electronic mail address as any party may, from time to time, designate in the manner set out above.

66.2 Any such notice or communication will be considered to have been received:

(a) if delivered by hand during business hours (and in any event, at or before 5:00 pm local time in the place of receipt) on a Business Day, upon receipt by a responsible representative of the receiver, and if not delivered during business hours, upon the commencement of business hours on the next Business Day; and

(b) if sent by electronic transmission during business hours (and in any event, at or before 5:00 pm local time in the place of receipt) on a Business Day, upon receipt, and if not delivered during business hours, upon the commencement of business hours on the next Business Day, provided that:

(i) the receiving party has, by electronic transmission, by hand delivery or by facsimile transmission, acknowledged to the notifying party that it has received such notice; or

(ii) within 24 hours after sending the notice, the notifying party has also sent a copy of such notice to the receiving party by hand delivery or facsimile transmission.

66.3 Delivery by mail will not be considered timely notice under this Agreement.

66.4 In the event of an emergency or urgent matter, in addition to the notice required by this Section 66, a verbal notice will be given as soon as the party giving the notice becomes aware of any material event or circumstance that gives rise to the requirement for a written notice being given.

67. LEGAL RELATIONSHIP

67.1 The Design-Builder is an independent contractor and not the servant, employee, partner or agent of the Owner.

67.2 The Design-Builder will not commit the Owner to the payment of any money to any person.

67.3 No partnership, joint venture or agency involving the Owner is created by this Agreement or under this Agreement.

67.4 All personnel engaged by the Design-Builder to design and construct the Project are at all times the employees or Subcontractors of the Design-Builder and not of the Owner. The Design-Builder is solely responsible for all matters arising out of the relationship of employer and employee.

68. ASSIGNMENT

68.1 The Design-Builder will not, without the prior written consent of the Owner, assign, either directly or indirectly, any right or obligation of the Design-Builder under this Agreement.

68.2 The Owner may, upon notice to the Design-Builder, assign any or all of its rights or obligations under this Agreement to any other agency or organization that will assume responsibility for the operation of the Facility. Subject to the foregoing and subject to the right of assignment of the licence referred to in Section 17.5, the Owner will not, without the prior written consent of the Design-Builder, assign, either directly or indirectly, any right or obligation of the Owner under this Agreement.

69. INTEREST

69.1 If payment by either party of any amount payable under this Agreement is not made when due, interest will be payable on such amount at:

(a) 1% per annum over the prime rate for the first 30 days; and

(b) 2% per annum over the prime rate thereafter,

calculated from the date due under this Agreement until paid, compounded monthly. The party to whom payment is owed and overdue will notify the other party at least monthly of the overdue amount and the accrued interest on that amount. The prime rate is the annual rate of interest announced by the Royal Bank of Canada (or its successor), or any other Canadian chartered bank agreed to by the parties, as its “prime” rate then in effect for determining interest rates on Canadian dollar commercial loans made by it in Canada.

70. WAIVER

70.1 No waiver by either party of a right of that party or any breach by the other party in the performance of any of its obligations under this Agreement is effective unless it is in writing.

70.2 No waiver of any right or obligation is a waiver of any other right or obligation under this Agreement.

70.3 Failure or delay to complain of an act or failure of the other party or to declare the other party in default, irrespective of how long the failure or delay continues, does not constitute a waiver by the party of any of its rights against the other party.

70.4 The duties and obligations imposed by this Agreement and the rights and remedies available hereunder will be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by Law.

71. ASSUMPTION OF RISK

71.1 Except to the extent expressly allocated to the Owner or otherwise provided for under this Agreement, all risks, costs and expenses in relation to the performance by the Design-Builder of its obligations under this Agreement are allocated to, and accepted by, the Design-Builder as its entire and exclusive responsibility.

72. GENERAL DUTY TO MITIGATE

72.1 In all cases where the Design-Builder is entitled to receive from the Owner any additional compensation or any costs, damages or extensions of time, the Design-Builder will use all reasonable efforts to mitigate such amount required to be paid by the Owner to the Design-Builder under this Agreement, or the length of the extension of time. Upon request from the Owner, the Design-Builder will promptly submit a detailed description, supported by all such documentation as the Owner may reasonably require, of the measures and steps taken by the Design-Builder to mitigate and meet its obligations under this Section 72.

73. OTHER PROVISIONS

73.1 The exclusions, waivers and limitations of liability, representations and warranties and indemnities in this Agreement, the provisions of Sections 61, 62, 64, 65 and rights accrued prior to completion or termination of this Agreement will survive the completion or termination of this Agreement.

73.2 This Agreement constitutes the entire agreement between the parties, expressly superseding all prior agreements and communications (both oral and written) between any of the parties hereto with respect to all matters contained herein or therein, and except as stated herein or the instruments and documents to be executed and delivered pursuant hereto, contains all the representations and warranties of the respective parties.

73.3 No waiver of any provision of this Agreement and no consent required pursuant to the terms of this Agreement is binding or effective unless it is in writing and signed by the party providing such waiver or consent.

73.4 No failure to exercise, and no delay in exercising, any right or remedy under this Agreement will be deemed to be a waiver of that right or remedy. No waiver of any breach of any provision of this Agreement will be deemed to be a waiver of any subsequent breach of that provision or of any similar provision.

73.5 This Agreement enures to the benefit of and binds the Owner, its successors and its assigns and the Design-Builder and its successors and permitted assigns.

73.6 The parties must do everything reasonably necessary to give effect to the intent of this Agreement, including execution of further instruments.

73.7 The Design-Builder and the Owner will take all reasonable and necessary steps to minimize and avoid all costs and impacts arising out of the performance of the Work and this Agreement.

73.8 Neither the Owner nor the Design-Builder will take advantage of any apparent discrepancy, ambiguity, error or omission in this Agreement and will notify the other party forthwith following the detection of anything it suspects may be an ambiguity, discrepancy, error or omission.

73.9 Each Schedule attached to this Agreement is an integral part of this Agreement as if set out at length in the body of this Agreement.

73.10 This Agreement may only be amended by an agreement of the parties in writing. No such amendments will be valid unless executed by the Owner and the Design-Builder.

73.11 This Agreement will be deemed to be made pursuant to the Laws of the Province of British Columbia and the Laws of Canada applicable therein and will be governed by and construed in accordance with such Laws.

73.12 For the purposes of any legal actions or proceedings brought by any party hereto against the other party, the parties hereby irrevocably submit to the exclusive jurisdiction of the courts of the Province of British Columbia and acknowledge their competence and the convenience and propriety of the venue and agree to be bound by any judgment thereof and not to seek, and hereby waive, review of its merits by the courts of any other jurisdiction.

73.13 Where the Design-Builder is a joint venture, partnership or consortium, each member agrees to be jointly and severally liable for the obligations of the Design-Builder.

73.14 Time is of the essence of this Agreement.

73.15 This Agreement may be executed in any number of counterparts, each of which will be deemed to be an original, and this has the same effect as if the signatures on the counterparts were on a single copy of this Agreement so that it will not be necessary in making proof of this Agreement to produce or account for more than one such counterpart.

73.16 A party may deliver an executed copy of this Agreement by facsimile or other electronic means but that party will immediately deliver to the other parties an originally executed copy of this Agreement.

[Execution Page Follows]

IN WITNESS WHEREOF the parties have executed this Agreement as of the Effective Date.

BOARD OF EDUCATION OF SCHOOL DISTRICT NO. 39 (VANCOUVER)

J. David Green, Secretary Treasurer

Per: _____
Authorized Signatory

Per: _____
Authorized Signatory

BIRD DESIGN-BUILD CONSTRUCTION INC.

Per: _____
Authorized Signatory

Per: _____
Authorized Signatory

IN WITNESS WHEREOF the parties have executed this Agreement as of the Effective Date.

BOARD OF EDUCATION OF SCHOOL DISTRICT NO. 39 (VANCOUVER)

_____
Authorized Signatory

Per: _____
Authorized Signatory

BIRD DESIGN-BUILD CONSTRUCTION INC.

Per:

Per:

Domenico S. Costantini
Vice President & District Manager

PAUL BERGMAN, EVP BUILDINGS

SCHEDULE 1

STATEMENT OF REQUIREMENTS

TABLE OF CONTENTS

SCHEDULE 1

STATEMENT OF REQUIREMENTS

PART 1. DEFINITIONS AND INTERPRETATION

1.1 Definitions

1.1.1 In this schedule, in addition to the definitions set out in the main body of the Agreement:

1.1.1.1 (1) "**BIM ID**" means items identified in the Millwork Legend Appendix 1B and referenced in Appendix 1B – School Room Data Sheets;

1.1.1.1 (2) "**Building Management System**" means a controls system which allows monitoring and operation of the entire Facility from a single location and through a remote internet connection;

1.1.1.1 (3) "**Canteen**" means the food service area providing take-away food product for purchase by students;

1.1.1.1 (4) "**Ceiling Height**" means the height from the finished floor to the underside of the interior ceiling finish without any projection into the clear height and/or, in the case of exposed structure ceiling, the underside of structure;

1.1.1.1 (5) "**Childcare Centre Room Data Sheets**" means the room data sheets in Appendix 1E (A) –School Room Data Sheets;

1.1.1.1 (6) "**Data Drop**" means a CAT6 cable terminated on one end to a patch panel located in the nearest telecommunications room and the other end terminated to a female RJ45 connector and faceplate connected to a junction box;

1.1.1.1 (7) "**Departmental Learning Zones**" means clusters of rooms within same department situated in close proximity as defined in adjacency diagrams in the Functional Program.

1.1.1.1 (8) "**Direct Adjacency**" means spaces that are immediately beside each other, on the same level, and have internal connections not through a corridor;

1.1.1.1 (9) "**Direct Connection**" means physical access between rooms or components using a minimal amount of horizontal circulation. The maximum horizontal distance away calculated from the point of entry into the room or component must not exceed 30 metres;

1.1.1.1 (10) "**Direct Visual Access**" or "**Direct Visual Connection**" is defined as provision of unobstructed view from one space, area or component to another to promote a sense of community, active and passive supervision, or connection to the outdoors. For interior-to-interior locations, the view may be from one space to another via minimum three (3) square meter glazed openings and may occur across corridors. For interior-to-exterior locations, the view may be via the exterior glazing;

1.1.1.1 (11) "**First People's Principles of Learning**" means curriculum reflecting a respectful and holistic approach to teaching and learning to advance quality education of all First Nations students in British Columbia;

1.1.1.1 (12) "**Formal Learning Spaces**" means traditional physical spaces within the School such as classrooms, laboratories, workshops and gymnasium;

1.1.1.1 (13) "**Functional Program**" means the functional program in Appendix 1A – School Functional Program;

1.1.1.1 (14) "**Good Industry Practice**" means the exercise of the degree of skill and care, diligence, prudence and foresight which would be reasonably and consistently expected from a skilled and experienced professional design-builder undertaking a project similar in size, scope and complexity of the Project;

1.1.1.1 (15) "**Group**" means a group of children having its own room or rooms which are fully furnished and equipped;

1.1.1.1 (16) "**Group Daycare**" means a year-round full-day service typically opening between 7:00am and 8:00am and closing between 5:30 pm and 6:30 pm.

1.1.1.1 (17) "**Human Scale**" means the measure of the size of the Facility and its parts in relation to the person or people using it. The Human Scale is perceivable and relatable in relation to the size of a person. Human Scale is a scale that feels comfortable and appropriate to a person, for example, steps, doorways, canopies are sized to feel comfortable (not oversized to induce a feeling of being small or undersized to induce a feeling of being large in relation to the built form);

1.1.1.1 (18) "**Indirect Connection**" means secondary/ancillary access between two spaces which may include corridor access and in the case of the Library Learning Commons to the School Commons may include a visual connection where space overlooks the space below;

1.1.1.1 (19) "**Infant**" means a child under 18 months of age;

1.1.1.1 (20) "**Informal Learning**" means spaces that a non-discipline specific spaces inside or outside of the School used by students for the purpose of learning activities such as the school commons, exterior school commons, hallways, corridors, music practice rooms, library learning commons study rooms and lounge reading area;

1.1.1.1 (21) "**Net Area**" or "**Net Square Meters**" or "**NSM**" means the actual occupiable and usable floor area of each room or space as measured to the interior finished surfaces of all walls, partitions, or mechanical enclosures;

1.1.1.1 (22) "**Preschool**" means a part-day service for children 3-5 years old. Children attend either morning or afternoon sessions of 2 to 3 hours each session, usually operating from September to June;

1.1.1.1 (23) "**Preschooler**" means a child between 2 ½ and 5 years of age;

1.1.1.1 (24) "**Primary Circulation**" or "**Primary Corridor**" means circulation paths serving the main circulation routes connecting the primary components (departments) of the School as delineated by Appendix 1A – School Functional Program with a minimum clear width of 4 metres;

1.1.1.1 (25) "**Program Requirements**" means a design requirement that relates to the Owner's philosophy, values, goals, and space requirements for specific functions;

1.1.1.1 (26) "**Rain-Screen Principles**" means that the applicable wall cladding system incorporates:

1.1.1.1 (26) (a) a means to drain all accumulated water to the exterior of the Facility;

1.1.1.1 (26) (b) materials installed to shed precipitation;

1.1.1.1 (26) (c) means of preventing moisture penetration through the exterior of the wall assembly; and

1.1.1.1 (26) (d) flashings, drips or overhangs, sufficient to deflect accumulated water away from the Facility face.

1.1.1.1 (27) "**Schedule**" means this Schedule 1 – Statement of Requirements;

1.1.1.1 (28) "**School Room Data Sheets**" means the room data sheets in Appendix 1B –School Room Data Sheets;

1.1.1.1 (29) "**Secondary Circulation**" means corridors or other paths serving as circulation routes within the component spaces of the School as delineated by Appendix 1A – School Functional Program components with a minimum clear width of 2.5 metres;

1.1.1.1 (30) "**Toddler**" means a child between 18 and 36 months of age;

1.1.1.1 (31) "**Typology Diagram**" means the study and documentation of spaces which have similarities in their type of function, configuration or spatial elements; and

1.1.1.1 (32) "**Void Space**" means space which is trapped between walls and/or structure and is intended to be used for building systems and/or circulation.

1.2 Schedule Overview

1.2.1 The Statement of Requirements, including all appendices, describes the key physical, functional and technical requirements of the Design and Construction. The requirements are at times written in the imperative form and, except where otherwise expressly stated within the Statement of Requirements, all work described in or required by the Statement of Requirements will be an obligation of the Design-Builder. All things to be provided, delivered, performed or done by the Design-Builder as prescribed within the Statement of Requirements are deemed to be read and to be interpreted as "Design-Builder will".

1.2.2 The documents forming this Schedule are intended to be complementary and interpreted in harmony.

1.2.3 Capitalized room names used in this Schedule have the meaning established in Appendix 1A – School Functional Program and Appendix 1E – Childcare Centre Requirements.

1.2.4 Appendix 1H – VSB Mechanical Standards and Appendix 1I – VSB Electrical Standards are based on the Owner's standard documents which are used on various types of construction projects, including projects not delivered pursuant to a design-build delivery model. The intent of these appendices is to make the Design-Builder responsible for complying with all requirements. References to terms such as "consultant", "Consultant", "Seismic Engineer", "Electrical Consultant", "Mechanical Consultant", "Architect", "Contractor", "contractor", "general contractor", "subcontractor" and similar terms will be interpreted to mean the Design-Builder (including, where applicable, the Design-Builder's Subcontractors, the Design-Builder's Consultant or the Design-Builder's suppliers) unless the context clearly requires otherwise. References to the term "Prime Consultant" and "VSB" will be interpreted to mean the Owner unless the context clearly requires otherwise. If the Design-Builder is unclear of the intent of any provision within Appendix 1H – VSB Mechanical Standards or Appendix 1I – VSB Electrical Standards, the Design-Builder will seek instructions from the Owner's Consultant.

PART 2. GENERAL

2.1 Standards of Design and Construction

2.1.1 The Design-Builder will complete the Design and Construction:

2.1.1.1 (1) in accordance with the Standards and any other standards specified in this Schedule;

2.1.1.1 (2) having regard for the concerns, needs and interests of:

2.1.1.1 (2) (a) all persons who will use the Facility, including the Owner, students, staff, and other program users;

2.1.1.1 (2) (b) all governmental authorities; and

2.1.1.1 (2) (c) the community.

2.1.2 If the Design-Builder proposes to make reference to a code or standard from a jurisdiction outside of Canada, then the Design-Builder will demonstrate to the satisfaction of the Owner, the Owner's Consultant and authorities having jurisdiction that such code or standard meets or exceeds the requirements of this Schedule.

2.1.3 The Design-Builder will design the Facility to have a design service life of at least 50 years. Individual Facility components and systems will have a design service life of consistent with Good Industry Practice or such longer period as may be expressly specified in this Schedule.

2.1.4 The Design-Builder will perform the Design and Construction in compliance with the current version of all applicable standards or as referenced in the VBBL regardless of whether they are included in this Schedule or not, including:

2.1.4.1 (1) AAMA Field Testing Specifications;

2.1.4.1 (2) AATCC-134: Electrostatic Propensity of Carpets;

2.1.4.1 (3) AATTCC-174: Parts 2 and 3 Antimicrobial Activity Assessment of Carpets;

2.1.4.1 (4) ANSI/ASA S12.60-2010: acoustical performance criteria, design requirements and guidelines for Schools – parts 1 and parts 2;

2.1.4.1 (5) ANSI / ASHRAE:

2.1.4.1 (5) (a) 52.2: Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size;

2.1.4.1 (5) (b) 55: Thermal Environmental Conditions for Human Occupancy;

2.1.4.1 (5) (c) 62.1: Ventilation for Acceptable Air Quality;

2.1.4.1 (5) (d) 90.1: Energy Efficient Design for New Buildings;

2.1.4.1 (5) (e) 111: Practices for Measurement, Testing, Adjusting & Balancing of Building HVAC Systems;

2.1.4.1 (5) (f) 129: Measuring Air Change Effectiveness;

2.1.4.1 (5) (g) 135: BACnet-A Data Communication Protocol for Building Automation and Control Networks;

2.1.4.1 (5) (h) 2013 – The Commissioning Process;

2.1.4.1 (5) (i) S12.2: Criteria for Evaluating Room Noise; and

2.1.4.1 (5) (j) Drop Advanced Energy Design Guides 50 Percent K-12 School Building;

2.1.4.1 (6) ASHRAE:

2.1.4.1 (6) (a) Handbooks: HVAC Applications, HVAC Systems and Equipment, Fundamentals, Refrigeration;

2.1.4.1 (6) (b) Design of Smoke Control Systems;

2.1.4.1 (6) (c) Guideline 12-2000 - Minimizing the Risk of Legionellosis Associated with Building Water Systems;

2.1.4.1 (6) (d) Guideline 1-1 – HVAC&R Technical Requirements for the Commissioning Process;

2.1.4.1 (6) (e) ASHRAE Guidelines 1 – The HVAC Commissioning process; and

2.1.4.1 (6) (f) ASHRAE Guidelines 12 – Minimizing the Risk of Legionellosis Associated with Building Water Systems;

2.1.4.1 (7) ANSI / ASME:

2.1.4.1 (7) (a) B31.9 Building Services Piping;

2.1.4.1 (7) (b) Section IX: Welding Qualifications; and

2.1.4.1 (7) (c) Unfired pressure vessels;

2.1.4.1 (8) ASPE Plumbing Engineering Design Handbook, Volumes 1-4;

2.1.4.1 (9) ASTM:

2.1.4.1 (9) (a) A17.1/CSA B44 – Safety Code for Elevators and Escalators;

2.1.4.1 (9) (b) ASTM C568-03 – Standard Specification for Limestone Dimension Stone;

2.1.4.1 (9) (c) ASTM C615-03 – Standard Specification for Granite Dimension Stone;

2.1.4.1 (9) (d) ASTM C503-05 – Standard Specification for Marble Dimension Stone; and

2.1.4.1 (9) (e) ASTM C616-03 – Standard Specification for Quartz-Based Dimension Stone;

2.1.4.1 (10) BCSLA and BCLNA – BC Landscape Standard.

2.1.4.1 (11) AWMAC: Architectural Woodwork Manufactures Association of Canada;

2.1.4.1 (12) BCICA Quality Standards Manual for Mechanical Insulation;

2.1.4.1 (13) B44 Safety Code for Elevators;

2.1.4.1 (14) CSA:

2.1.4.1 (14) (a) B52HB-05: Mechanical Refrigeration Code;

2.1.4.1 (14) (b) B149.1-00: Natural Gas and Propane Installation Code;

2.1.4.1 (14) (c) B651-95: Barrier Free Design;

2.1.4.1 (14) (d) A23.1/A23.2 - Concrete Materials and Methods of Concrete Construction / Test Methods and Standard Practices for Concrete;

2.1.4.1 (14) (e) A23.3 – Design of Concrete Structures;

2.1.4.1 (14) (f) A23.4 – Precast Concrete - Materials and Construction;

2.1.4.1 (14) (g) A371 – Masonry Construction for Buildings;

2.1.4.1 (14) (h) O86 – Engineering Design in Wood;

2.1.4.1 (14) (i) S136 – North American Specification for the Design of Cold-Formed Steel Structural Members;

2.1.4.1 (14) (j) S16 – Design of Steel Structure;

2.1.4.1 (14) (k) S304 – Design of Masonry Structure;

2.1.4.1 (14) (l) S413 – Parking Structures;

2.1.4.1 (14) (m) S478 – Guideline of Durability in Buildings; and

2.1.4.1 (14) (n) S832 – Seismic Risk Reduction of Operational and Functional Components (OFCs) of Buildings);

2.1.4.1 (15) NFPA:

2.1.4.1 (15) (a) 10: Standard for Portable Fire Extinguishers;

2.1.4.1 (15) (b) 13: Standard for the Installation of Sprinkler Systems;

2.1.4.1 (15) (c) 90A –Standard for Installation of Air Conditioning and Ventilation Systems;

2.1.4.1 (15) (d) 92A –Standard for Smoke-Control Systems Utilizing Barriers and Pressure Differences; and

2.1.4.1 (15) (e) 101 –Life Safety Code;

2.1.4.1 (16) Master Municipal Construction Document (MMCD);

2.1.4.1 (17) Master Painting Institute: MPI Architectural Painting Manual; and

2.1.4.1 (18) BC Supplement to TAC Geometric Design Guide.

2.2 Technical Acronyms

2.2.1 In this Schedule, the following acronyms have the following meanings:

2.2.2 "**AAMA**" means the American Architectural Manufacturers Association;

2.2.3 "**AAS**" means Aluminum Association Standards;

2.2.4 "**AIBC**" means Architectural Institute of British Columbia;

2.2.5 "**AFF"** means Above Finished Floor;

2.2.6 **"AHC"** means Architectural Hardware Consultant;

2.2.7 **"ANSI"** means American National Standards Institute;

2.2.8 "**ASHRAE"** means American Society of Heating, Refrigerating and Air-Conditioning Engineers;

2.2.9 **"ASME"** means American Society of Mechanical Engineers;

2.2.10 **"ASPE"** means American Society of Plumbing Engineers;

2.2.11 "**ASTM**" means American Society of Testing and Materials;

2.2.12 "**AWCC**" means Association of Wall and Ceiling Contractors;

2.2.13 "**AWMAC**" means Architectural Woodwork Manufacturer's Association of Canada;

2.2.14 "**AWPA**" means American Wood Protection Association;

2.2.15 "**AWWA**" means American Water Works Association;

2.2.16 "**BCICA**" means British Columbia Insulation Contractors Association;

2.2.17 "**BCLNA**" means British Columbia Landscape & Nursery Association;

2.2.18 "**BCSLA**" means British Columbia Society of Landscape Architects;

2.2.19 "**BMS**" means Building Management System;

2.2.20 "**CCI**" means Canadian Carpet Institute;

2.2.21 "**CEC**" means Canadian Electrical Code;

2.2.22 "**CGSB**" means Canadian General Standards Board;

2.2.23 "**CISC**" means the Canadian Institute of Steel Construction;

2.2.24 "**CISCA**" means Ceiling Interior Systems Construction Association;

2.2.25 "**CMCA**" means Canadian Masonry Contractors Association;

2.2.26 "**COV**" means the City of Vancouver;

2.2.27 "**CPTED**" means Crime Prevention through Environmental Design;

2.2.28 "**CRTC**" means Canadian Radio-television and Telecommunications Commission;

2.2.29 "**CRI**" means Canadian Rug Institute;

2.2.30 "**CSA**" means Canadian Standards Association;

2.2.31 "**CSDFMA**" means Canadian Steel Door and Frame Manufacturers Association;

2.2.32 "**CSSBI**" means Canadian Sheet Steel Building Institute;

2.2.33 "**dB**" means decibels;

2.2.34 "**dBA**" means A-weighted sound level;

2.2.35 "**DDC**" means Direct Digital Controls;

2.2.36 "**DHI**" means Door and Hardware Institute;

2.2.37 "**EASE**" means Enhanced Acoustic Simulator for Engineers;

2.2.38 "**EGBC**" means Engineers and Geoscientist British Columbia;

2.2.39 "**FUS**" means Fire Underwriters Survey;

2.2.40 "**GCA**" means Glazing Contractors Association of BC;

2.2.41 "**HVAC**" means heating, ventilating and air-conditioning;

2.2.42 "**ID**" means Inside Diameter;

2.2.43 "**IGMAC**" means Insulating Glass Manufacturers Association of Canada;

2.2.44 "**IIC**" means Impact Isolation Class;

2.2.45 "**LCD**" means Liquid Crystal Display;

2.2.46 "**LED**" means Light Emitting Diode;

2.2.47 "**MMCD**" means the Master Municipal Construction Documents;

2.2.48 "**MPI**" means Master Painters Institute;

2.2.49 "**NBC**" means National Building Code of Canada;

2.2.50 "**NEMA**" means National Electrical Standards Association (see CSA);

2.2.51 "**NFCA**" means National Floor Covering Association of Canada;

2.2.52 "**NFPA**" means National Fire Protection Association;

2.2.53 "**OC**" means On Centre;

2.2.54 "**OD**" means Outside Dimension;

2.2.55 "**PBX**" means Private Branch Exchange;

2.2.56 "**PUDO**" means Pick-up Drop-off;

2.2.57 "**RCABC**" means Roofing Contractors Association of BC;

2.2.58 "**SBS**" means Modified Bitumen Roofing System;

2.2.59 "**SMACNA**" means Sheet Metal and Air Conditioning Contractors' National Association;

2.2.60 "**SPL**" means Sound Pressure Level;

2.2.61 "**STC**" means Sound Transmission Class;

2.2.62 "**TAC**" means Transportation Association of Canada;

2.2.63 "**TIA**" means Telecommunications Industry Association;

2.2.64 "**TTMAC**" means Terrazzo and Tile Manufacturers Association of Canada;

2.2.65 "**TVOC**" means Total Volatile Organic Compounds;

2.2.66 "**ULC**" means Underwriters' Laboratories of Canada;

2.2.67 "**UPS**" means Uninterruptible Power Supply;

2.2.68 "**VOC**" means Volatile Organic Compounds;

2.2.69 "**WAP**" means Wireless Access Point; and

2.2.70 "**WH**" means Warnock Hersey.

2.3 Childcare Centre Requirements

2.3.1 The Design-Builder will provide a licensable, fully functional 69-space group Childcare Centre within the Facility. The Design-Builder will ensure that the Childcare Centre complies with the requirements in Appendix 1E – Childcare Centre Requirements. In addition to these requirements, the Design-Builder will be responsible for all other approvals and permits required for the design, construction and occupancy of the Childcare Centre.

2.3.2 The Design-Builder will ensure that the Childcare Centre complies with the requirements in Appendix 1E – Childcare Centre Requirements. In addition to these requirements, the Design-Builder will be responsible for all other approvals and permits required for the design, construction and occupancy of the Childcare Centre.

2.3.3 The Design-Builder will locate exhausts and other mechanical equipment away from the rooftop Childcare Centre outdoor areas. Refer to Section 2.1.3.3 of Appendix 1E – Childcare Centre Requirements.

2.3.4 Vertical circulation (elevator) will be shared with the School. Refer to Section 6.12 Conveying Equipment (Division 14).

2.4 Minimum Useful Life Requirements

2.4.1 The Design-Builder will provide selected architectural, structural, mechanical and electrical systems with minimum useful life that meets or exceed the durations set out in the table below:

Facility Component	**Minimum Useful Life**
Substructure	50 years
Structure	50 years
Building Envelope	25 years
Interior Floor Finishes	10 years

Facility Component	**Minimum Useful Life**
Interior Wall Finishes	7 years
Interior Ceiling Finishes	20 years
Interior Fittings and Fixtures	20 years
Major Electrical Systems	25 years
Lighting Systems	15 years
Plumbing Systems	25 years
Fire Protection Systems	25 years
Communication Systems	25 years
Heating, Ventilation & Air Conditioning Systems	25 years
Elevators	25 years
Exterior Paving	20 years

PART 3. DESIGN PRINCIPLES

3.1 Mission and Vision Statement

3.1.1 The mission of the Eric Hamber Secondary School is to develop responsible citizens and lifelong learners who respect learning, the environment, themselves, and others;

3.1.2 The vision for the School is to be a diverse and inclusive school that provides a state-of-the-art learning environment. The School will be designed to optimize the use of flexible and visible learning spaces to maximize collaboration and active learning;

3.2 Values and Identity

3.2.1 Students, educators and the school community take great pride in the Eric Hamber Secondary School for its past, current and future achievements and initiatives. The legacy of the school is celebrated through its academic well roundedness and engagement with the larger community. The school celebrates its strong drama, music and athletic programs to name a few. Their after-school programs have gained recognition and their ability to host city-wide sporting events have developed into an even stronger athletics program for the school students. The drama and music programs put great effort into their yearly production and the ability to continue sharing these productions and concerts with the community will continue to strengthen the program. These programs provide opportunities for the active school community as well as engage their strong network of alumni. The new School will carry forward this legacy and allow for continued growth and excellence.

3.2.2 The following terms describe the Eric Hamber Secondary School's values and identity:

3.2.2.1 (1) Well rounded;

3.2.2.1 (2) Engaged and involved community;

3.2.2.1 (3) Pride;

3.2.2.1 (4) Tradition;

3.2.2.1 (5) Athletics;

3.2.2.1 (6) Strong after-school programs;

3.2.2.1 (7) Safe space for students;

3.2.2.1 (8) Place for opportunities; and

3.2.2.1 (9) Proud heritage.

3.3 Guiding Principles

3.3.1 School Aspirations:

3.3.1.1 (1) Design and build a School that will support and uphold the Owner's Strategic Plan, 21st Century Learning, the Owner's Design Principles and the Owner's Indigenous Objectives as set out in this Section 3.3.

3.3.2 Owner's Strategic Plan:

3.3.2.1 (1) Engage our learners through innovative teaching and learning practices;

3.3.2.1 (2) Build capacity in our community through strengthening collective leadership;

3.3.2.1 (3) Create a culture of care and shared social responsibility.

3.3.3 21st Century Learning – Ministry of Education - Highlights of BC's Redesigned Curriculum

3.3.3.1 (1) Personalized Learning: The redesigned BC curriculum provides flexibility to inspire the personalization of learning and addresses the diverse needs and interests of BC students;

3.3.3.1 (2) Ecology and the Environment: The Science curriculum provides better representation of ecology and environmental learning;

3.3.3.1 (3) Historical Wrongs: The curriculum includes the history of the Asian and South Asian communities and their contribution to the development of our province – as well as the injustices they experienced;

3.3.3.1 (4) Indigenous Perspectives and Knowledge Indigenous Culture and Perspectives: These have been integrated throughout all areas of learning. For example, place-based learning and emphasis on indigenous ways of knowing reflect the First People's Principles of Learning in the curriculum;

3.3.3.1 (5) Flexible Learning Environment: The redesigned BC curriculum provides teachers with great flexibility in creating learning environments that are relevant, engaging, and novel. Flexible learning environments consider local context and place-based learning.

3.3.4 Owners' Design Principles:

3.3.4.1 (1) Healthy Safe Environments: The environment will be one that emphasizes wellness and promotes lifelong health. Holistic design for the physical, social and emotional need of all stakeholder is key in promoting wellbeing.

3.3.4.1 (2) Maximizing Flexibility and Adaptability – Today and Future: The School will be designed to optimize the use of flexible and adaptable learning spaces to maximize collaboration and active learning. The new learning environment will provide a flexible learning spaces to meet the need of all learners.

3.3.4.1 (3) Optimizing Teaching and Learning Spaces: Create opportunities for School community engagement. The School will create places of collaboration for teachers, student, community members, staff and parents.

3.3.4.1 (4) Professional Development that Supports Collective Idea Sharing: Create learning spaces where students and staff interact outside of the traditional classroom. Students will have the opportunity to learn across multiple spaces, honouring the notion that learning can happen everywhere.

3.3.4.1 (5) Connections to the Wider Community: The Facility must establish an engaging civic presence in its neighbourhood. The Facility's materials, massing, siting and elevations will contribute to an inspiring and coherent design that is complementary to the neighbourhood.

3.3.5 Owner's Indigenous Objectives

3.3.5.1 (1) The Owner has an objective to develop broader knowledge, awareness and understanding Musqueam history, traditions and culture. The goal is to create a welcoming Facility environment that helps all visitors develop a better appreciation of Musqueam culture. This objective is described in the 'Indigenous Enhancement Agreement' (also referred to as the Aboriginal Education Enhancement Agreement - June 2016 – June 2021) available on the Owner's website.

3.3.5.1 (2) The Facility design will acknowledge and incorporate Musqueam culture in visible and prominent locations on both the exterior and interior of the Facility;

3.3.5.1 (3) The Design-Builder will be responsible for running a competitive selection process to select, together with the Owner, an artist(s) to incorporate Musqueam design elements into the Facility. The budget for this work will be agreed to in advance between the Design-Builder and Owner. **[Note to Proponents: This section will be updated based on the successful Proponent's Technical Submission on the "Incorporation of Musqueam Design Elements" Scored Elements.]**

3.4 Critical School Success Factors

3.4.1 The Design-Builder will provide a building area that satisfies the area requirements set out in the Functional Program.

3.4.2 The Functional Program lists the types of rooms or space, number and size of rooms, and the contents of some rooms, and other significant design features which the Owner has identified as being necessary so that the Facility can accommodate the Program Requirements.

3.4.3 The Design-Builder will design the Facility to meet the intent of the Functional Program, including indicative area requirements.

3.4.4 Net Area requirements for the School are the minimum requirement.

3.4.5 The Design-Builder will ensure that the following spaces, as described in the Functional Program, will have direct at-grade access:

3.4.5.1 (1) Industrial Education;

3.4.5.1 (2) Operations and Maintenance;

3.4.5.1 (3) Servery;

3.4.5.1 (4) Music;

3.4.5.1 (5) Life Skills;

3.4.5.1 (6) Gymnasiums;

3.4.5.1 (7) Drama/Dance;

3.4.5.1 (8) Music;

3.4.5.1 (9) Main Entry; and

3.4.5.1 (10) Administration/ Health and Counselling.

3.4.6 The Design-Builder will design and build the School such that the School will function in secure zones and the following zones are independently securable at times deemed appropriate by the Owner:

3.4.6.1 (1) Zone 1 – Administration component in the Administration/Health Education and Counselling department, will have interior access from School internal corridor/foyer and access to the Counselling component for use during regular School hours. The zone will have the ability to be closed off after regular School hours;

3.4.6.1 (2) Zone 2 – Counselling component in the Administration/Health Education and the Counselling department, will have interior access from School internal corridor/foyer and access to Administration component for use during regular School hours and will have the ability to be closed off after regular School hours;

3.4.6.1 (3) Zone 3 – Physical Education/Athletics component will have direct access from the exterior and will have access to washrooms within the secure zone;

3.4.6.1 (4) Zone 4 – Fine Arts (Music, Drama, Dance & Auditorium) components will have access to washrooms within the secure zone;

3.4.6.1 (5) Zone 5 – School Commons and Applied Skills (Home Economics) will have access to washrooms within the secure zone;

3.4.6.1 (6) Zone 6 – Library Learning Commons will have access from the School Commons within the secure zone; and

3.4.6.1 (7) Zone 7 - Auditorium and School Commons will have access to washrooms within the secure zone. The Auditorium and associated support spaces as included within Appendix 1J will be securable from the remainder of Zone 4 (Fine Arts) to permit community access to the Auditorium.

3.4.7 The Design-Builder will incorporate the following requirements into the Design of the Facility:

3.4.7.1 (1) prioritize the educational needs of a diverse student body;

3.4.7.1 (2) support a variety of learning and teaching styles by providing spaces for large group, small group and individual activities;

3.4.7.1 (3) allow for community usage of spaces (e.g. Gymnasiums, Multipurpose Commons, Library Learning Commons, Meeting rooms) as described in the Functional Program;

3.4.7.1 (4) be safe, durable and energy efficient;

3.4.7.1 (5) easy to maintain such that disruption caused by maintenance and repairs is minimized;

3.4.7.1 (6) provide a welcoming entrance with connection to the exterior;

3.4.7.1 (7) provide universal accessibility across all spaces in the Facility;

3.4.7.1 (8) provide natural lighting, visual connection to the exterior and ventilation as outlined in the Functional Program and the School Room Data Sheets;

3.4.7.1 (9) meet seismic requirements;

3.4.7.1 (10) provide opportunities to highlight and celebrate student work, achievements and heritage with display spaces as contemplated in Appendix 1A – School Functional Program; and

3.4.7.1 (11) provide easy access and wayfinding throughout the Facility.

3.5 Facility Hours of Operations

3.5.1 The Facility will be open between 6:00 am and 10:00 pm.

3.5.2 The Design-Builder will design the School to be used for both day and after hours use by the students, staff and community for teaching and extracurricular activities.

3.5.3 The School is available for rent by the community in the evenings and on the weekends and will be zoned as per Section 3.4.6 of this Schedule.

3.6 Design Capacity (School and Childcare Centre)

3.6.1 The Design-Builder will design and build the School to accommodate a minimum 1700 students and 120 staff.

3.6.2 The Design-Builder will design and build the Childcare Centre to accommodate the spaces specified in Section 2.3 – Childcare Centre Requirements.

3.7 Sustainable Design Principles

3.7.1 In addition to achieving LEED Gold Certification for the Facility, the Design-Builder will design and construct the Facility using design methods, building materials that take into account, energy and life cycle considerations to promote environmental quality and help minimize the Owner's operating costs (for example in relation to utilities and carbon taxes).

3.7.2 The Design-Builder will use:

3.7.2.1 (1) materials and products that are suitable for the School climatic conditions and not detrimental to human health; and

3.7.2.1 (2) materials that are of quality and durability that reflect the School's role as a landmark civic building.

3.7.3 The Design-Builder will design the School in such a way (placement of spaces for passive shading and thermal mass principles) in order to minimize heat gains and hence temperature in summer.

3.7.4 FSC Certified wood is preferred throughout where practical and available. The Design-Builder will also consider the use of beetle damaged wood products where practical and available.

3.7.5 Where appropriate for the substrate and assembly, mineral fibre and the "eco-friendly" version of spray insulation (for example "Eco" Walltite by BASF, or "Eco" by Demilec.) are preferred.

3.7.6 The Design-Builder will design the Facility to encourage the use of alternative modes of transportation (e.g., walking and cycling) and the use of low-emission vehicles.

3.7.7 The Design-Builder will consider and use strategies to reduce conflict between vehicles, pedestrians, cyclists, and wheelchair users.

3.8 Site Design Principles

3.8.1 The Design-Builder will:

3.8.1.1 (1) design the School to integrate into the existing neighbourhood;

3.8.1.1 (2) provide for on-site roadways, walkway, open spaces adjacent to the Facility, and vehicle and bike parking areas to be lit during darkness to ensure safe vehicle, pedestrian, and bike traffic in respect to collisions, personal safety, and Facility access and egress; and

3.8.1.1 (3) provide electrical, and telecommunication services to support the Facility.

3.8.2 The Design-Builder will incorporate into the Design:

3.8.2.1 (1) physical safety and security;

3.8.2.1 (2) CPTED;

3.8.2.1 (3) safe and well-lit spaces for wheelchair bound individuals planned conjunction with other outdoor areas;

3.8.2.1 (4) micro-climatic effects on comfort and safety by careful consideration of Facility location and orientation, sheltering of walkways and entrances and access to light throughout the year in outdoor spaces;

3.8.2.1 (5) requirements for snow dump and snow storage areas;

3.8.2.1 (6) regionally adapted environmental design that includes restorative elements such as bio-swales and indigenous ground cover planting;

3.8.2.1 (7) safe and legible transitions between the Existing School and the School, roadways and parking, and open space and public sidewalks; and

3.8.2.1 (8) use of trees and other elements in the landscape to screen where desirable and to mitigate effects of cold weather and winter storms.

3.8.3 Site Circulation

3.8.3.1 (1) The Design-Builder will ensure paths of travel are Accessible/Barrier-Free and have distinct tactile qualities where pedestrian traffic crosses through large open areas (e.g., parking lots).

3.8.3.1 (2) Within large open areas, the Design-Builder will use a continuous strip of material in a contrasting colour that is texturally different from travel paths to define a safe, detectable and direct route across the area.

3.8.4 The Design-Builder will use distinct colour contrast between paths of travel and adjacent ground surfaces at:

3.8.4.1 (1) pedestrian access and wayfinding;

3.8.4.1 (2) bicycle access and parking;

3.8.4.1 (3) vehicular access and parking; and

3.8.4.1 (4) circulation at the perimeter of the Facility.

3.8.5 The Design-Builder will use landscape elements such as planters and planting to reinforce location of the main entrance.

3.8.6 The Design-Builder will position plants to guide the direction of travel towards the entrance.

3.8.7 The Design-Builder will ensure entries are adequately lit taking into consideration seasonal and daily use patterns.

3.8.8 The Design-Builder will provide on-site safe student pick-up and drop off of students for Childcare Centre and special needs students.

3.8.9 The Design-Builder will provide the following structures on the Site:

3.8.9.1 (1) a standalone lockable emergency supply building measuring 2.5 metres x 3.7 metres with drainage, hose bib, heating and lighting;

3.8.9.1 (2) Class A bike storage for students and staff as per the VBBL requirements;

3.8.9.1 (3) outdoor covered secure enclosure with gates adjacent to the Wood Workshop and Metal Workshop;

3.8.9.1 (4) Outdoor covered space adjacent to the Wood Workshop and Metal Workshop for dust extraction system;

3.8.9.1 (5) Garbage and recycling enclosure for the Facility.

3.8.10 The Design-Builder will provide bollards and chains for vehicular access control at the W 33rd Avenue vehicular site entrance and the Willow Street vehicular site exit.

3.8.10.1 (1) Bollards will be steel pipe sections minimum 102 mm dia and will be located on both sides of each vehicular access.

3.8.10.1 (2) Chains will be minimum 6 mm galvanized steel

3.8.10.1 (3) Provide with 200 mm x 400 mm 16 ga black steel driveway plate sign painted with black and yellow stripes at each chain.

3.9 Landscape Design Principles

3.9.1 The Design-Builder will:

3.9.1.1 (1) provide a landscape design that is prepared by a BCSLA registered landscape architect and that complies with the VBBL requirements;

3.9.1.1 (2) ensure that the work and materials will meet the requirements of the latest edition of the Canadian Landscape Standard, prepared by the Canadian Society of Landscape Architects and the Canadian Nursery Landscape Association;

3.9.1.1 (3) provide landscaped surfaces to the Site, exclusive of hard-surfaced circulation and paved areas;

3.9.1.1 (4) ensure that grassed areas are sodded;

3.9.1.1 (5) locate trees, lighting, furnishings and other elements to support wayfinding through the Site, with particular emphasis on the Facility entrances;

3.9.1.1 (6) provide hard surface access to all entrances and exits (including fire exits) to a minimum width of 1.5 metres;

3.9.1.1 (7) provide landscaping that provides shelter from sun, rain and wind;

3.9.1.1 (8) provide landscaping that offers views of trees and plants that reflect seasonal change;

3.9.1.1 (9) locate deciduous trees on the south and west side of the Facility to provide shade in summer and to allow sunlight through in the winter to facilitate year-round moderation of the internal Facility climate;

3.9.1.1 (10) use landscaping in and around surface parking and other paved areas to intercept precipitation, reduce surface heating, protect pedestrians from the elements and soften the views and reduce the visual scale of the parking from the sidewalk and street;

3.9.1.1 (11) ensure that landscaping supports public safety by allowing visual surveillance of all parts of the Site;

3.9.1.1 (12) design landscapes, including planters and decorative landscape areas to incorporate low impact storm water features that retain and or infiltrate run-off; and

3.9.1.1 (13) use hardy, drought-tolerant, perennial species, reducing the need for maintenance, pesticide use, and which will not require irrigation once established, which meet the Owner and COV requirements.

3.9.2 The Design-Builder has been provided with the Arborist Report and inventory of existing trees on the School site, which was conducted to identify tree health and preliminary tree protection/retention and tree removals. The Design-Builder acknowledges and agrees that:

3.9.2.1 (1) preliminary tree protection zones were calculated by the arborist for each tree according to the COV Protection of Trees Bylaw 9958 requirements for minimum protection around a tree based on an indicative design;

3.9.2.1 (2) the findings and recommendations in the Arborist Report, including trees proposed for removal, are for reference only;

3.9.2.1 (3) tree removals have been recommended in the Arborist Report to accommodate the proposed development zone/setbacks based on the indicative design, or due to tree health and structure;

3.9.2.1 (4) there are 95 protected trees on the site and one of these trees is shared with the COV. Permission from the COV Board of Parks is required prior to the removal of the one tree shared with COV. The applicable COV bylaw on trees requires that replacement trees be planted for trees that are removed. The COV will decide the quantity of replacement trees required and the Design-Builder will then prepare a tree replacement plan showing the location and species in satisfaction of applicable Bylaw(s); and

3.9.2.1 (5) once a finalized design has been completed, the Design-Builder will develop their own arborist report to confirm the tree protection zones in satisfaction of applicable by-law and to confirm the number of trees recommended for removal.

3.9.3 The Design-Builder will provide new curb cuts required by the COV as follows:

3.9.3.1 (1) main entrance along W 33rd Avenue between Laurel Street and Oak Street; and

3.9.3.1 (2) exit along Willow Street south of W 33rd Avenue.

3.10 Safety and Security Principles

3.10.1 The Facility will be designed and constructed by the Design-Builder to achieve the following objectives related to the safety and security of students and staff:

3.10.1.1 (1) provide security from criminal activity, such as personal assault or theft of property;

3.10.1.1 (2) safety from environment hazards;

3.10.1.1 (3) protection of physical privacy and personal dignity;

3.10.1.1 (4) safety from equipment hazards;

3.10.1.1 (5) protection of staff from physical hazards;

3.10.1.1 (6) mitigation of occupational hazards for common staff activities in each area of the Facility;

3.10.1.1 (7) protection of personal information; and

3.10.1.1 (8) emergency preparedness and management of emergency conditions.

3.10.2 The Design-Builder will incorporate in the Design of the Facility the following general lockdown principles:

3.10.2.1 (1) design the Facility to safeguard Facility occupants against potential, life-threatening violence by armed assailants;

3.10.2.1 (2) lockdown provisions specific to the Facility layout will be coordinated with the Owner during design and user consultation;

3.10.2.1 (3) provide signage outside the Facility and at all entrances directing visitors to report to the main office;

3.10.2.1 (4) provide hardware on exterior doors that can easily be secured at the door by School staff;

3.10.2.1 (5) ensure that spaces designed as secure spaces include:

3.10.2.1 (5) (a) solid doors;

3.10.2.1 (5) (b) door hardware that permits occupants to lock without a key from inside space and is key accessible from outside;

3.10.2.1 (5) (c) windows which are break resistant and provided with occupant-controlled blinds;

3.10.2.1 (5) (d) lighting that can be turned off by the room's occupants; and

3.10.2.1 (5) (e) location of communication equipment within secure spaces so that they are not visible through interior doors or windows.

3.10.2.1 (6) The Design-Builder will incorporate in the design for the School Main Office the following lockdown principles:

3.10.2.1 (6) (a) provide secure space within the main office secured with door hardware;

3.10.2.1 (6) (b) provide clear sightlines to see approaching visitors;

3.10.2.1 (6) (c) provide a physical barrier such as millwork separating staff work areas from publicly accessible spaces; and

3.10.2.1 (6) (d) provide second exit from the office area when practical in the Design.

3.10.2.1 (7) The Design-Builder will incorporate in the design for the Principal/Vice Principals' Offices the following lockdown principles:

3.10.2.1 (7) (a) design the Principal and Vice Principals' offices as secure spaces;

3.10.2.1 (7) (b) locate these offices behind a barrier separating work and public access areas;

3.10.2.1 (7) (c) locate these offices so that they can be used as secure safe areas for other office staff;

3.10.2.1 (7) (d) provide in the Open Office Workstations and Principal Office an administration phone integrated to the PA system with emergency all-page capabilities, with 1 CAT6 Data Drop terminated in close proximity to the phone location and in consultation with the Owner;

3.10.2.1 (7) (e) provide 1 RJ11 Data Drop in the Principal Office, Vice Principal Office (1 & 2) and Open Office Workstations rooms for emergency analog phones;

3.10.2.1 (7) (f) locate RJ11 Data Drops in consultation with the Owner;

3.10.2.1 (7) (g) provide occupant-controlled roller shades for interior windows; and

3.10.2.1 (7) (h) provide lights in the Principal/Vice Principals' offices that can be turned off by the room's occupants.

3.10.2.1 (8) The Design-Builder will provide secure spaces dispersed throughout the School located such that they are easily and quickly accessible by School occupants.

3.10.2.1 (9) The Design-Builder will ensure that the total number and area of secure spaces will accommodate the total occupancy of an area, pod, or section of the School.

3.10.2.1 (10) Many smaller secured spaces are preferable to a few large secured spaces.

3.10.2.1 (11) The Design-Builder will design as secure spaces rooms such as classroom spaces, resource rooms and offices that are enclosed by walls.

3.10.3 The Design-Builder will incorporate in the Design of Site layout and the Facility, including landscape development and lighting CPTED principles such as the following:

3.10.3.1 (1) minimize opportunities for hiding spaces in both interior and exterior spaces;

3.10.3.1 (2) have a particular regard for limiting theft, mischief and vandalism in the design of the School;

3.10.3.1 (3) minimize opportunities for graffiti through the use of paint repellent breathable sealer. At a minimum provide paint and pen repellent breathable sealer on concrete and concrete block walls from floor to 2.4 metres height as follows:

3.10.3.1 (3) (a) on all exterior exposed surfaces;

3.10.3.1 (3) (b) on interior spaces, such as
.1 corridors;
.2 School Commons;
.3 Athletics department;
.4 Art Studios;
.5 stairwells; and
.6 washrooms and change room;

3.10.3.1 (4) provide and use paint and pen repellent breathable sealer that:

3.10.3.1 (4) (a) does not alter the look of materials such as concrete/concrete block and prevents graffiti from curing into the pours of the materials;

3.10.3.1 (4) (b) enables paint repellent cleaner to lift and remove graffiti stains without ghosting; and

3.10.3.1 (4) (c) withstands repeated cycles of commercial cleaners without fading or staining;

3.10.3.1 (5) provide Site lighting in the parking area to ensure safety; and

3.10.3.1 (6) minimize the visibility of security devices in the student areas;

3.10.4 The Design-Builder will engage a third party Level II CPTED practitioner to develop a report showing compliance with CPTED principles;

3.10.5 The Design-Builder will install motorized “overhead rolling service shutter” on the exterior side in accordance with Section 6.7.8 Specialty Doors with all ground level windows along South and East sides and hidden areas such as courtyards.

3.10.6 The Design-Builder will incorporate in the Design of the exterior of the Facility the following:

3.10.6.1 (1) exterior lighting near Facility entrances, exits, walkways, public areas, staff and outdoor spaces and parking areas;

3.10.6.1 (2) ensure lighting will not cause glare, shadow, or high contrast with surrounding areas and will not flood onto neighboring areas or properties;

3.10.6.1 (3) ensure lighting of outdoor spaces which creates an unobtrusive, Human Scale lighting concept, with a hierarchy of fixture types designed according

to functional and security needs (including CPTED), and reflecting the hierarchy of pedestrian corridors and outdoor spaces;

3.10.6.1 (4) ensure that shrubbery within 2 metres of walkways will not exceed 50cm in height.

3.11 Flexibility Principles

3.11.1 The Design-Builder will undertake a Design that allows for efficient, economical and minimally-disruptive physical and operational future changes throughout the life of the Facility, including services distribution, building systems, and mix of rooms.

3.11.2 The Design-Builder will ensure that the Design of the Facility:

3.11.2.1 (1) consolidates service risers and hubs in strategically accessible and expandable locations;

3.11.2.1 (2) provide closets, cabinets, chases and shafts for access and growth;

3.11.2.1 (3) provide clear and open spaces to allow for future flexibility;

3.11.2.1 (4) locate permanent Facility elements such as stair, elevator and duct shafts to minimize constraints on configuration change;

3.11.2.1 (5) provide a simple Facility perimeter and non-restrictive fenestration pattern;

3.11.2.1 (6) avoid interior shear walls;

3.11.2.1 (7) locate global circulation corridors to allow for possible School alteration without increasing the complexity of the global circulation system as a whole;

3.11.2.1 (8) provide standardized room layouts for repetitive rooms throughout the School; and

3.11.2.1 (9) provide structural system and elements to meet the requirements as specified in Section 5.1.8 of this Schedule.

3.12 Use of Wood

3.12.1 The Design-Builder will:

3.12.1.1 (1) comply with the current version of the *Wood First Act* (British Columbia) and use wood as both structural elements and as design features where allowed in accordance with the VBBL;

3.12.1.1 (2) use the 'wood use matrix' supplied by the Wood Enterprise Coalition as a tool for communicating decisions about where wood will be used; and

3.12.1.1 (3) use elements such as interior wood paneling, exposed wood structure and wood acoustic ceilings in the School Commons and where consistent with the overall School objectives and the Wood First Act. The Owner does not support use of exposed, exterior wood structures.

3.12.2 The Design-Builder is encouraged to consider the use of wood in areas that may require innovation and VBBL alternative solutions.

3.12.3 The use of wood is acceptable as a material feature in key locations such as:

3.12.3.1 (1) Gymnasiums;

3.12.3.1 (2) Drama Studio;

3.12.3.1 (3) Library Learning Commons;

3.12.3.1 (4) School entrances;

3.12.3.1 (5) School Commons;

3.12.3.1 (6) soffits; and

3.12.3.1 (7) Auditorium.

3.13 Equipment

3.13.1 Refer to Appendix 1D – Furniture, Fixture and Equipment, Appendix 1B – School Room Data Sheets and Appendix 1E – Childcare Centre Requirements. The Design-Builder will accommodate such equipment in the Design of the Facility. The Design-Builder will determine the locations and method of installation of such equipment in consultation with the Owner.

PART 4. ARCHITECTURAL DESIGN PRINCIPLES

4.1 Location and Siting

4.1.1 The Design-Builder will ensure that the percentage of the soft landscaping within the footprint of the Site will not be less than 5%.

4.1.2 The Design-Builder will minimize impacts of the new Facility on existing adjacent neighbours by providing landscape buffer and/or screen by careful placement of services such as loading, garbage, recycling, generator, and transformers.

4.1.3 The Design-Builder will locate the Childcare Centre at the east end of the Facility, farthest away from Oak Street to minimize the impact of noise and airborne pollution generated from Oak Street.

4.1.4 The massing of the Facility will step back from W 33rd Avenue and Oak Street in both plan and section to provide an articulated massing that breaks up the perceived length and bulk of the Facility appropriate to the surrounding urban context. The main entry to the Facility will be clearly visible and identifiable from primary approach routes to the Facility.

4.1.5 The minimum setback from the Oak Street and W 33rd Avenue property lines will be 16 metres to the face of the Facility at the lowest occupied level. No built structures, including Class A bicycle parking, are allowed within the Oak Street and W 33rd Avenue setbacks.

4.1.6 The massing of the Facility as viewed from the corner of W 33rd Avenue and Oak Street is to include appropriate articulation and glazing to reduce instance of long, opaque walls and promote visual connection.

4.1.7 A maximum of 50% of the Facility's massing at the lowest occupied level is allowed at the 16 metres setback along the W 33rd Avenue frontage. A maximum of 25% of the Facility's massing at the lowest occupied level is allowed within 20 metres of the W 33rd Avenue frontage. The remainder of the Facility's massing will step back.

4.1.8 The Design-Builder will preserve the existing lane north of the Existing School for school use, accessed from the existing Willow Street entrance.

4.2 Access to Daylight and Views

4.2.1 The Design-Builder will provide a Design of the interior of the Facility that:

4.2.1.1 (1) maximizes natural light and view to the outside throughout the Facility; and

4.2.1.1 (2) provides visible access to daylight and unobstructed view (long and short) to the outside for students and staff, including views of nature, to improve overall experience and educational learning outcomes.

4.2.2 The Design-Builder will ensure, as a minimum, that:

4.2.2.1 (1) access to daylight and views are provided at all Primary Circulation and Secondary Circulation routes, including corridors accessing learning, administration and support areas;

4.2.2.1 (2) glazed doors are provided at entrances from and to the exterior along Primary Corridors; and

4.2.2.1 (3) windows in corridor are located on the perimeter of the Facility and provide unobstructed view without impediments, within a 9 metre horizontal view line, 90 degrees to the glazing;

4.2.3 Refer to Appendix 1B – School Room Data Sheets for locations requiring natural light.

4.2.4 As noted within this Schedule, the Design-Builder will meet or exceed the following minimum natural light criteria:

4.2.4.1 (1) interior spaces to receive direct natural light will comply with the requirements of Section 4.8.4;

4.2.4.1 (2) indirect natural light means light that is transmitted to an interior space through a window and that comes from the adjacent space having direct natural light;

4.2.4.1 (2) (a) the centre of any such interior space requiring indirect natural light will fall within a 10 metre light radius, if the area is over 45 square metres or otherwise within an 8 metres light radius;

4.2.4.1 (3) provide glare control and minimize heat gain with the provision of sunshades and other solar control measure at windows as required;

4.2.4.1 (4) provide exterior shading devises including roof overhangs, fixed exterior fins and interior light shelves, designed to shade during the summer and provide solar access during the winter.

4.2.4.1 (5) outdoor public spaces will be designed to maximize sunlight and views.

4.2.4.1 (6) design access to outdoor spaces create an easy flow from indoors to outdoors;

4.2.4.1 (7) provide courtyards and gardens to accommodate programmed activities, including:

4.2.4.1 (7) (a) areas designed to allow a wide range of student interaction including socializing, studying and group project collaborative work;

4.2.4.1 (7) (b) informal spaces that can also be used for staff-student and community interaction that can be a combination of interior and exterior spaces working in unison;

4.2.4.1 (7) (c) Accessible/Barrier-Free garden space adjacent to public areas.

4.3 Building Configuration and Circulation

4.3.1 The Design-Builder will:

4.3.1.1 (1) ensure that the Facility exterior signage will clearly indicate access for students, staff and the community, as well as for services providers and suppliers;

4.3.1.1 (2) ensure that the entrance of the Facility for students and staff and the community is clearly identifiable;

4.3.1.1 (3) locate and design the Athletics/Physical Education program areas to take advantage of the surrounding outdoor activity areas;

4.3.1.1 (4) ensure that the Facility siting, form and massing will coordinate with the neighbourhood and site amenities and maintain existing views, pathways and interconnections;

4.3.1.1 (5) screen and integrate into the architectural expression of the Facility elevator penthouses, roof top mechanical equipment and telecommunication elements;

4.3.1.1 (6) provide organized rooftop mechanical and service equipment;

4.3.1.1 (7) ensure all roof top equipment is fully integrated with the Design of the Facility;

4.3.1.1 (8) screen and incorporate into architectural elements rooftop mechanical equipment and systems as per COV requirements; and

4.3.1.1 (9) locate away from the main roadway, main entrances and public areas and screened from public, student and staff views, all at-grade mechanical and service equipment and kiosks.

4.3.1.1 (10) develop a clear and simple layout of corridor systems using straight lines and consistent right angles for ease of Construction and navigation;

4.3.1.1 (11) design the layout to be close to identical on all levels;

4.3.1.1 (12) provide level interior circulation throughout each floor;

4.3.1.1 (13) locate stairs, elevator, and washrooms in close proximity to each other;

4.3.1.1 (14) provide a layout that permits efficient grouping of program areas;

4.3.1.1 (15) design stairwells as Facility features, with glazing to assist in wayfinding;

4.3.1.1 (16) locate a central stairwell near the main entry and administration area;

4.3.1.1 (17) provide views that support wayfinding and orientation, daylighting, and supervision;

4.3.1.1 (18) ensure that the School and Childcare Centre has dedicated separate entrances;

4.3.1.1 (19) provide secure and safe access for non-School time visitors, including the Auditorium, drama studio, dance studio, gymnasium, music studio, Library Learning Commons and School Commons; and

4.3.1.1 (20) provide the Childcare Centre with at-grade dedicated separate entrance vestibule, with a shared elevator and stairs between the School and Childcare Centre.

4.4 Form and Character

4.4.1 The Design-Builder will showcase high level design, creativity and innovation in the form and massing of the Facility.

4.4.2 The Design-Builder will provide a cost-efficient Design.

4.4.3 The Design-Builder will provide a Design for a Facility that is interwoven into the surrounding site and landscape through:

4.4.3.1 (1) Facility Design and landscape elements;

4.4.3.1 (2) connection between indoors and outdoors through the use of glazing and floor to grade continuous transitions; and

4.4.3.1 (3) connection of interior and exterior materials.

4.4.4 In the Facility Design, the Design-Builder will incorporate:

4.4.4.1 (1) generous roof overhangs, flat roofs, large overhangs on the south façade to control the summer sun while allowing for passive solar heating in winter as a form of energy conservation;

4.4.4.1 (2) extensive use of glazing, where reasonable, allowing the integration of the Facility into its surround landscape; and

4.4.4.1 (3) open floor plans, minimal and carefully considered use of interior partitions to foster flexibility, and adaptability of interior spaces.

4.4.5 The Design-Builder will ensure that primary entries will be of Human Scale.

4.4.6 The Design-Builder will reduce perceived bulk and scale of the Facility by dividing the building mass into smaller components.

4.4.7 The Design-Builder will provide canopies, building cantilevers and protrusions that are:

4.4.7.1 (1) integral to the Facility to provide coverage for length of pedestrian traffic area along front facades of the Facility;

4.4.7.1 (2) provide canopies that are of minimum two metres in depth for length of coverage and allow for shelter from rain and allow daylight to filter through;

4.4.7.1 (3) provide canopies for Loading/Shipping/Receiving loading area;

4.4.7.1 (4) provide canopies at primary Facility entries to the following program areas:

4.4.7.1 (4) (a) School Commons;

4.4.7.1 (4) (b) Athletics;

4.4.7.1 (4) (c) Fine Arts;

4.4.7.1 (4) (d) Administration, Health, Counselling and International Education; and

4.4.7.1 (4) (e) Building Engineering and Operations; and

4.4.7.1 (5) provide entry canopy at the main entrance.

4.4.8 The Design-Builder will use as primary exterior material for the School a minimum of 65% of the following:

4.4.8.1 (1) architectural concrete;

4.4.8.1 (2) glazing; and

4.4.8.1 (3) metal paneling.

4.4.9 The Design-Builder will ensure that adjacent materials will be coordinated, integrated and compactible in proportions, seizes and alignment of material, joint lines and control joints.

4.4.10 The Design-Builder will ensure that an overall appearance concept will be evident and contribute to the exterior and interior design concept;

4.4.11 The Design-Builder will seal architectural concrete with a clear coat graffiti resistant sealer.

4.4.12 Coloured concrete will not be used.

4.5 Quality of Space (Exterior and Interior)

4.5.1 The Design-Builder will:

4.5.1.1 (1) maximize the sense of space both in width and height in interior entry areas, common and circulation areas;

4.5.1.1 (2) maximize opportunities for access to natural light, views and natural ventilation through the use of operable windows;

4.5.1.1 (3) provide views and/or direct or indirect natural light at ends of corridors;

4.5.1.1 (4) use glazed canopies, windows, doors and clerestory windows to bring natural daylighting in to exterior and interior spaces;

4.5.1.1 (5) not use skylights;

4.5.1.1 (6) provide optimized lines of sight between administration and areas of public entries, corridors and student areas;

4.5.1.1 (7) provide direct line of sight between Administration suite and the main School entry;

4.5.1.1 (8) provide optimal positioning of program spaces by ensuring columns and mechanical shafts do not interfere with the intended function and/or flexibility of the space. Column free spaces are permitted to have perimeter column enclosures protrude from perimeter walls by no more than 350 mm. The following spaces at minimum are to be column free:

4.5.1.1 (8) (a) Library Learning Commons - Open Learning Space & Maker Creative Space;

4.5.1.1 (8) (b) School Commons;

4.5.1.1 (8) (c) Art Studios;

4.5.1.1 (8) (d) Dance Studio;

4.5.1.1 (8) (e) Drama Studio;

4.5.1.1 (8) (f) Music Rooms - Band, Strings, Choral;

4.5.1.1 (8) (g) Gymnasium Large & Gymnasium Small;

4.5.1.1 (8) (h) General Instruction Classrooms;

4.5.1.1 (8) (i) Yearbook Room;

4.5.1.1 (8) (j) Science Labs - Universal, Physics, Chemistry;

4.5.1.1 (8) (k) Food Rooms;

4.5.1.1 (8) (l) Textiles Lab;

4.5.1.1 (8) (m) Business Education Classroom;

4.5.1.1 (8) (n) MAC Lab, Math Programming Lab, Computer Lab;

4.5.1.1 (8) (o) Special Education Classrooms - LSP, LS, LALS, Sr. LAC, Jr. LAC;

4.5.1.1 (8) (p) Special Education Sensory Rooms - General Sensory, Sensory Room – LS; and

4.5.1.1 (8) (q) Sensory Room – LALS; and

4.5.1.1 (8) (r) Refer to Appendix 1J [Auditorium Specifications].

4.5.1.1 (9) ensure that Formal Learning Spaces are sufficiently isolated from the acoustic and vibration ramifications of mechanical rooms, electrical rooms elevator shafts or control rooms;

4.5.1.1 (10) provide a variety of outdoor and indoor student social spaces;

4.5.1.1 (11) include suitable spaces throughout the School for the display of two and three-dimensional art complete with wall backing for mounting with display lighting, power, and data connectivity;

4.5.1.1 (12) employ a professional registered interior designer to design the interiors for the School;

4.5.1.1 (13) ensure the interior Design reflects the values of the Facility;

4.5.1.1 (14) ensure the overall exterior and interior Design throughout the Facility is integrated;

4.5.1.1 (15) provide a distinct character for the Facility which relates to its purpose and the Owner, students, staff and the community using the Facility; and

4.5.1.1 (16) provide student centric design elements that support student learning.

4.6 Entrances

4.6.1 The Design-Builder will ensure that all entrances:

4.6.1.1 (1) are protected from snow and rain by canopies;

4.6.1.1 (2) are clear and visible from the streetscape;

4.6.1.1 (3) relate to the overall Site circulation strategies and are of adequate size and scale to signal an entry point(s) to the Facility;

4.6.1.1 (4) are transparent and create a strong indoor/outdoor connection;

4.6.1.1 (5) create unique entry points that are well integrated and of a scale that is inviting and reflects a modern School using outdoor seating, lighting and paving materials; and

4.6.1.1 (6) deal effectively with mud, sand and dirt from outside coming to inside of the Facility.

4.7 Building Envelope

4.7.1 The Design-Builder will:

4.7.1.1 (1) provide a building envelope Design that complies with the VBBL requirements;

4.7.1.1 (2) retain an approved building envelope consultant as required by the VBBL;

4.7.1.1 (3) complete all Design and Construction so as to prevent the accumulation and stagnation of rain, snow, ice and dirt on the horizontal and vertical surfaces of the envelope including the roof design for the climate of the Lower Mainland;

4.7.1.1 (4) design exterior walls in accordance with the Rain-Screen Principles;

4.7.1.1 (5) provide a continuous air space of minimum 25 mm clear width;

4.7.1.1 (6) ensure that materials and systems of the wall and roof assemblies contribute to reducing heat gains and losses with minimal decline in performance over their expected 50-year lifespan;

4.7.1.1 (7) ensure continuation of the air barrier, vapour barrier, thermal barrier and rain barrier across the entire envelope including foundations, walls and roofs;

4.7.1.1 (8) design building envelope details to avoid thermal bridging;

4.7.1.1 (9) utilize a building envelope professional (whose credentials as a building envelope professional are recognized by the AIBC or the EGBC) to review and certify building envelope design and construction, as required to conform to the requirements of VBBL;

4.7.1.1 (10) ensure that the continuity of the weather-tight plane including air, moisture, and vapor barriers insulation, plus drainage and ventilation of assembly voids will be clearly and graphically depicted in the working drawings and applicable shop drawings.

4.7.1.1 (11) not use exterior insulated finishing systems (EIFS) or similar face sealed wall assemblies;

4.7.1.1 (12) ensure that all components of the assembly exterior to the weather-tight plane will be resistant to the deteriorating effect of exposure to the elements including water and sunlight, consistent with the services life of the Facility;

4.7.1.1 (13) eliminate direct paths of heat conduction by use of insulation, air space or other acceptable means;

4.7.1.1 (14) ensure that window and door frames are thermally broken;

4.7.1.1 (15) pay particular attention to foundation/wall, roof/wall, window/wall and structure/wall connections, changes in plane; including, intersections of walls and roofs, changes in cladding materials; and window and door heads/sills; and

4.7.1.1 (16) provide a Structure Monitoring Technology (SMT) leak detection system. Acceptable manufacturer: SMT Research Ltd or SMT Research certified agent.

4.8 External Architecture

4.8.1 The Design-Builder will:

4.8.1.1 (1) develop architecture for the Facility that has a complementary scale and relationship to the surrounding neighbourhood. Refer to COV policies and guidelines.

4.8.1.1 (2) use materials will be durable with simple detailing that allow for replacement and or upgrades of parts and systems;

4.8.1.1 (3) not use stucco, vinyl siding or other residential materials;

4.8.1.1 (4) use materials which are commercial grade, high quality and long lasting;

4.8.1.1 (5) ensure the Design and choice of exterior materials will reduce opportunities for vandalism and graffiti; and

4.8.1.1 (6) materials such as exposed concrete and masonry will be provided with coatings to resist graffiti and enable efficient cleaning.

4.8.2 Curtain wall is preferred over window wall**.**

4.8.3 Transparency

The Design-Builder will:

4.8.3.1 (1) design the Facility so that it provides day lighting that is balanced with shading and/or orientation for glare and heat gain;

4.8.3.1 (2) ensure that the School has a window to wall ratio of 28%-30%;

4.8.3.1 (3) coordinate sill heights in classrooms with the millwork and storage requirements specified in the School Room Data Sheets;

4.8.3.1 (4) develop a solution with transparency and a welcoming arrangement externally for students, staff and the community where entry points are clearly identified, and create a hierarchy of entry portals that are clearly identifiable, visible and safe;

4.8.3.1 (5) allow for the penetration of daylight while shielding harsh sun penetration and resulting heat gain;

4.8.3.1 (6) ensure that interior activities are clearly visible from the outside;

4.8.3.1 (7) create an exterior that connects the interior with the exterior allowing the School to spill out and the exterior to be part of the School.

4.8.3.1 (8) design the Facility such that it prevents climbing up onto adjacent parts of the Facility.

4.8.4 Daylighting

The Design-Builder will:

4.8.4.1 (1) ensure that all areas receiving natural daylight are provided with blinds to control the amount of light entering the space unless noted otherwise in the School Room Data Sheets. Blinds will be motorized in locations specified in the School Room Data Sheets;

4.8.4.1 (2) design the Facility to achieve the daylighting requirements as this Schedule and the School Room Data Sheets.

4.8.5 Daylight average factor is the average indoor illuminance (from daylight) on the working plane within the room, expressed as a percentage of the simultaneous outdoor illuminance on a horizontal plane under an unobstructed CIE Standard Overcast Sky.

4.8.6 Where daylighting is required in the Facility, the Design-Builder will comply with IES guidelines and recommendations for daylighting factor and continuous daylight autonomy. Only areas with a uniformity (minimum illuminance/average illuminance) of 0.4 or greater will be considered daylighting factor calculations as being compliant. All areas receiving natural daylight will be provided with intelligent sensors to harvest lighting as per this Schedule.

4.8.7 Compliance of daylighting will be demonstrated through light simulation modelling software (IES Virtual Environment Flucs DL) for two different times of day and is to be used during all stages of design and certification process. The Design-Builder will provide a drawing minimum 1:100 scale showing all areas which achieve the criteria plus results for each room in tabulated form.

4.8.8 The Design-Builder will design and construct the interior and exterior spaces to interact functionally.

4.8.9 The Design-Builder will select material colors that are durable, weather well, and do not stain, streak, or discolour, nor grow algae or fungus.

4.8.10 The Design-Builder will ensure that adjacent materials are coordinated, integrated and compatible in proportions, sizes and alignment of material, joint lines and control joints. An overall appearance concept will be evident and contribute to the exterior and interior design concept.

4.9 Building Components

4.9.1 The Design-Builder will design and construct the Facility's interior building components in accordance with the following:

4.9.1.1 (1) the interior walls and partition systems will:

4.9.1.1 (1) (a) provide acoustic separations as required for the specific functions to be carried out in the spaces affected. Refer to the School Room Data Sheet and Appendix 1C – Acoustic and Noise Control Ratings; and

4.9.1.1 (1) (b) provide all separations required for fire safety and protection.

4.9.1.1 (2) seismic resistance capabilities will conform to the requirements of CSA S832-06 Guidelines for Seismic Risk Reduction of Operational and Functional Components of Buildings;

4.9.1.1 (3) provide seismic restraint of wall mounted cabinetry, millwork and shelving under supervision and review of a registered professional structural engineer;

4.9.1.1 (4) design and select interior walls and partitions, partition systems and interior finishes that comply with and optimize the following criteria as may be relevant for the particular or specific functions enclosed:

4.9.1.1 (4) (a) flexibility to permit adaptability of the internal spaces, if required to suit future process revisions;

4.9.1.1 (4) (b) easily cleanable and maintainable;

4.9.1.1 (4) (c) permanence and durability including impact resistance;

4.9.1.1 (4) (d) flexibility and adaptability of services;

4.9.1.1 (4) (e) low VOC emissions so as to minimize adverse impact on indoor air quality and indoor environmental quality;

4.9.1.1 (4) (f) aesthetic and design qualities to provide a positive environment for students and staff;

4.9.1.1 (4) (g) wall finishes, in the vicinity of plumbing fixtures, will be smooth and water resistant and will be washable wall protection using the Owner's grade disinfectant.

4.9.1.1 (4) (h) resistant to damage due to normal wear and resistant to damage due to collision in high use/traffic areas;

4.9.1.1 (4) (i) permanence and durability including impact resistance;

4.9.1.1 (4) (j) incorporate corner and wall protection resistance in corridors, workshops, heavy traffic areas, gymnasiums, spaces with equipment and as stated in the School Room Data Sheets;

4.9.1.1 (4) (k) non-toxic/ non-allergenic;

4.9.1.1 (4) (l) Void Space must be incorporated into the usable room/area if the Void Space is not of a size which can be outfitted in the future for a usable sole purpose. Void Space along corridors must be made available as completed alcoves; and

4.9.1.1 (4) (m) the completion of Void Spaces will not be deemed a cost to the Owner.

4.9.1.1 (5) provide a variety of secure display opportunities for student work or sports trophies;

4.9.1.1 (6) refer to the School Room Data Sheets and the Functional Program;

4.9.2 Formal and Informal Learning Spaces,

The Design-Builder will:

4.9.2.1 (1) provide spaces that meet the Program Requirements delivery including room proportion, placement of windows, doors and lines of sight that support the student learning and staff teaching environment; and

4.9.2.1 (2) locate and orient learning spaces into pods as described in the Functional Program.

4.9.3 Corridors

The Design-Builder will:

4.9.3.1 (1) provide corridors that are of adequate width to manage peak volumes of student flows typically experienced at class change;

4.9.3.1 (2) include study and student gathering nooks along corridors with passive supervision sightlines;

4.9.3.1 (3) provide corridors that allow for passive supervision of all student accessible areas;

4.9.3.1 (4) provide corridors that widen at interior high traffic areas;

4.9.3.1 (5) ensure corridors have extensive exposure to direct daylighting with exterior views at multiple locations;

4.9.3.1 (6) provide internal views from corridors to the School Commons (as well as from program spaces such as Library Learning Commons) to the School Commons;

4.9.3.1 (7) not provide corridors that are long, straight, corridors;

4.9.3.1 (8) not provide corridors with views of blank, dark end walls; and

4.9.3.1 (9) ensure that corridors have ceiling space designed to accommodate all mechanical and electrical services that require maintenance access, with access panels for feature walls at a maximum size of 600 mm x 1220 mm and visually organized to support the interior design aesthetic.

4.9.3.1 (10) ensure that Primary Corridors:

4.9.3.1 (10) (a) provide a visual connection between floors;

4.9.3.1 (10) (b) have an interconnection via stairs between floors;

4.9.3.1 (10) (c) have walls, unless walls are exposed architectural concrete or glazed, which are clear sealed white birch plywood from finished floor to 1220 mm above finished floors for durability;

4.9.3.1 (10) (d) have removable panels in sections not more than $3m^2$ for removal for mechanical and electrical IT access;

4.9.3.1 (10) (e) have exterior walls with continuous glazing; and

4.9.3.1 (10) (f) are not carpeted;

4.9.3.1 (10) (g) unless otherwise demonstrated Primary Corridors, the width of Primary Corridors will be as per the Functional Program; and

4.9.3.1 (11) ensure that secondary corridors:

4.9.3.1 (11) (a) have exterior windows at the end of every corridor;

4.9.3.1 (11) (b) have doors that sidelights into program areas; and

4.9.3.1 (11) (c) include seating benches that will be designed and constructed of proportions, dimensions and materials that support seating comfort;

4.9.4 Stairs

The Design-Builder will:

4.9.4.1 (1) provide feature stairs and exit stairs in key and easily found locations as visual focal points and unifying elements for students and staff;

4.9.4.1 (2) locate stairs to provide convenient, easily Accessible/Barrier-Free circulation routes;

4.9.4.1 (3) locate stairs along perimeter walls to allow for natural daylighting and exterior views;

4.9.4.1 (4) locate stairs to enhance planning flexibility;

4.9.4.1 (5) incorporate visual access to exterior and interior views for health benefits and passive supervision;

4.9.4.1 (6) provide stairs that are made of materials resistant to heavy use, and be impact resistant;

4.9.4.1 (7) not provide stairs made of Plexiglass;

4.9.4.1 (8) will obtain the approval of the Owner for materials, colors and patterns;

4.9.4.1 (9) provide exit stairs that:

4.9.4.1 (9) (a) meet existing VBBL requirements;

4.9.4.1 (9) (b) are located strategically for the convenience and safety of students and staff;

4.9.4.1 (9) (c) are made of architectural concrete;

4.9.4.1 (9) (d) have walls, unless walls are exposed architectural concrete or glazed, which are clear sealed white birch or white birch plywood from finished floor to 2400 mm above finished floors for durability; and

4.9.4.1 (9) (e) have a 19 mm (3/4”) thick, veneer, routed exposed edges on every wall;

4.9.4.1 (10) provide full height guard rails and interior stair dividers that allow for:

4.9.4.1 (10) (a) safe and secure students and staff egress;

4.9.4.1 (10) (b) natural daylighting light to pass through;

4.9.4.1 (10) (c) passive supervision from above and below;

4.9.4.1 (10) (d) are made of the glazing and architectural metal mesh.

4.9.4.1 (11) provide convenience stairs for student and staff use;

4.9.4.1 (12) provide stair treads, nosing and risers that are made of architectural concrete with resilient, rubber stair treads;

4.9.4.1 (13) ensure all exit stairs shared or used for Childcare Centre egress will have half-height handrails in addition to full-height handrails; and

4.9.4.1 (14) Childcare Centre half-height handrails will be a maximum 610mm high with a minimum 230mm gap between full-height and half-height handrails.

4.9.5 Washrooms

The Design-Builder will:

4.9.5.1 (1) provide washrooms as required in Appendix 1B - School Room Data Sheets and Appendix 1E - Childcare Centre Requirements that meet the VBBL requirements;

4.9.5.1 (2) ensure that the distribution of washrooms in the Facility accommodates the following:

4.9.5.1 (2) (a) the Gymnasium change room washroom counts, to accommodate 6 classes of thirty students equaling 180 students (90 male and 90 female);

4.9.5.1 (2) (b) separate staff washrooms:

4.9.5.1 (2) (c) a minimum of two washrooms per main floor (one female, one male);

4.9.5.1 (2) (d) each floor to have 1 student gender-neutral washroom to in the School;

4.9.5.1 (2) (e) one gender-neutral washroom located near the Performing Arts program; and

4.9.5.1 (2) (f) washrooms as indicated in the Functional Program;

4.9.5.1 (3) design the washrooms as per VBBL requirements;

4.9.5.1 (4) provide gender-neutral restrooms/washrooms (also called inclusive washrooms) in accordance with the following:

4.9.5.1 (4) (a) the gender-neutral washrooms will be Accessible/Barrier-Free, lockable and designed for a single individual, providing

individual privacy complete with floor to ceiling walls, a full height door and a single toilet and sink; and

4.9.5.1 (4) (b) the gender-neutral washroom will indicate through signage that it is designed for all genders;

4.9.5.1 (5) design all other student washrooms with no doors, minimum touch points, Direct Connection to general circulation, with no sightlines into washrooms; and

4.9.5.1 (6) refer to Section 3.4.6 regarding Facility zones and requirement for washrooms counts to serve each zone.

4.9.6 Custodial/Janitor Rooms

The Design-Builder will:

4.9.6.1 (1) provide such rooms as noted in the Functional Program;

4.9.6.1 (2) in addition, locate five custodial rooms spaced evenly throughout the School;

4.9.6.1 (3) provide at least one custodial room per floor;

4.9.6.1 (4) ensure that each custodial room will be a minimum of 10 m^2, with space to Each room to accommodate the following:

4.9.6.1 (4) (a) floor scrubber machine;

4.9.6.1 (4) (b) custodial cart;

4.9.6.1 (4) (c) mop sink;

4.9.6.1 (4) (d) adjustable shelving for storage of janitorial supplies, minimum 2 metres high and 2 metres long; and

4.9.6.1 (4) (e) 6 hooks for brooms, mops and dustpans.

4.9.7 Backing

The Design-Builder will:

4.9.7.1 (1) provide fittings, attachments and internal bracing/backing as required to accommodate and support wall-mounted fixtures, storage systems and equipment, including equipment for video conferencing and other applicable rooms;

4.9.7.1 (2) provide solid wood backing in all framed walls for solid connection to all wall mounted fixtures, storage systems and equipment including videoconferencing equipment, monitors, flat screen televisions and white boards;

4.9.7.1 (3) ensure that backing is minimum 19 mm plywood;

4.9.7.1 (4) refer to Room Data Sheets for locations, with final locations within each room to be approved by the Owner prior to covering up;

4.9.7.1 (5) provide wall backing that meets, at a minimum, the following requirements:

4.9.7.1 (5) (a) full width and height of walls as required to support wall mounted dumbbells and weights in exercise room;

4.9.7.1 (5) (b) for MDF and gypsum board surfaced wall assemblies, provide a 19 mm high x 12.7 mm thick strip of pressure treated plywood at the wall/floor interface. Where serving dual purpose for backing and wall finish, as per the School Room Data Sheets, provide white birch or white birch plywood for aesthetics;

4.9.7.1 (5) (c) provide concrete curb protection against water damage in spaces that contain equipment or services; and

4.9.7.1 (5) (d) provide cementitious backer board in wet areas. Backer board will be installed in accordance with the manufacturers written instructions to the full height of the tiling or other wall finish. The substrate will be protected with a 0.15 mm thick sheet of polyethylene installed behind the backer board and extending the full area of the backer board without joints.

4.9.8 Line of Sight

The Design-Builder will:

4.9.8.1 (1) design the Facility to allow lines of sight, providing the ability to see what is important from where a person is located both sitting and standing;

4.9.8.1 (2) locate and design the interior walls and columns to minimize disruption of exterior and interior views and line of sight.

4.9.8.1 (3) provide glazed walls and corridors and doorways that line up and provide clear lines of sight; and

4.9.8.1 (4) locate walls, furniture and equipment so as to provide clear lines of sight.

4.9.8.1 (5) ensure passive direct lines of sight will be provided, as per the Functional Program. Some of those passive supervision locations will include:

4.9.8.1 (5) (a) Administration office to main entry;

4.9.8.1 (5) (b) School Commons and exterior areas;

4.9.8.1 (5) (c) Gymnasium offices to the gymnasium;

4.9.8.1 (5) (d) Workshop and offices to the shop;

4.9.8.1 (5) (e) Formal and Informal Learning spaces to each other;

4.9.8.1 (5) (f) Primary corridors areas to the School Commons;

4.9.8.1 (5) (g) Library Learning Commons to the School Commons; and

4.9.8.1 (5) (h) School Commons to the main entry.

4.9.9 Gymnasium

The Design-Builder will:

4.9.9.1 (1) use Canadian standards for basketball, volleyball and badminton courts;

4.9.9.1 (2) provide gymnasium wall dividers as follows:

4.9.9.1 (2) (a) an acoustic retractable wall with access door, for Gymnasium Large;

4.9.9.1 (2) (b) a top rolling curtain to separate Gymnasium Small.

4.9.9.1 (3) provide fully retractable bleachers with capacity for 350 seats (two (2) sets of 175 seats);

4.9.9.1 (4) provide padding for all sharp corners in the gymnasiums and end-of-court padding on the walls directly behind the basketball hoops; and

4.9.9.1 (5) padding will be high density polyurethane foam complete with fasteners.

4.9.10 Library Learning Commons

The Design-Builder will:

4.9.10.1 (1) provide passive visual connection to School Commons with acoustic separation of the space with full height and full width of space large glazed wall and door, for flexibility and adaptability. Dimensions will be a minimum of 10 m wide by 4 m high;

4.9.10.1 (2) the floor throughout the entire Reading Room space will be designed to accommodate stationary library bookshelves; and

4.9.10.1 (3) provide adequate ventilation for the photocopy area within the Library Learning Commons.

4.9.11 Fine Arts

The Design-Builder will:

4.9.11.1 (1) For Drama, the Design-Builder will retain and provide a certified theatre consultant to work with the Owner to design the spatial, acoustic and technical aspects of the Auditorium, Control Rooms and Change Rooms as identified in Appendix 1J Auditorium Specifications, and the Drama Studio and Sound/Lighting Booth. The consultant will be retained and be available through all stages of the process.

4.9.11.1 (2) for Dance, the Design-Builder will:

4.9.11.1 (2) (a) provide a Dance Studio that is rectilinear in shape and proportioned for purpose it is intended; and

4.9.11.1 (2) (b) provide at minimum 15 metre long (uninterrupted including no doors) full wall with a 4 metre high mirror from finished, sprung dance floor;

4.9.11.1 (3) for Music, the Design-Builder will provide instrument storage. Acceptable product: Wenger or acceptable equivalent.

4.9.12 Surfaces

The Design-Builder will provide surfaces with the following characteristics, consistent with their functional purpose:

4.9.12.1 (1) resistant to microbial spread and growth;

4.9.12.1 (2) non-porous or smooth;

4.9.12.1 (3) durable;

4.9.12.1 (4) seamless;

4.9.12.1 (5) resilient and impact resistant;

4.9.12.1 (6) nontoxic/ non allergenic;

4.9.12.1 (7) presenting minimal glare;

4.9.12.1 (8) chemical resistant in areas using chemicals;

4.9.12.1 (9) constructed in a way that will not soak up or harbour moisture; and

4.9.12.1 (10) water impermeable in areas where water or dampness can occur.

4.9.13 Ceilings

The Design-Builder:

4.9.13.1 (1) acknowledges and agrees that the ceiling system will be considered as part of the interior spaces, and will ensure that it is accessible or inaccessible in total or in part as required to comply with each room's requirements as set out in the School Room Data Sheets;

4.9.13.1 (2) will ensure that accessible ceiling systems provide access to the ceiling spaces throughout the system;

4.9.13.1 (3) will group together ceiling services in corridors so that two or three services are installed on one ceiling tile allowing greater access to ceiling spaces;

4.9.13.1 (4) will ensure that access panels are manageable by maintenance staff;

4.9.13.1 (5) for access panels not described in Appendix 1H – VSB Mechanical Standards, provide access panels with minimum size of 600 mm x 600 mm, and ensure such access panels are not accessible by students;

4.9.13.1 (6) acknowledges and agrees that ceiling systems will comprise a major component of the acoustic or sound attenuation function as required in the spaces in which they are installed and will ensure that it conforms to the requirements of Appendix 1C – Acoustic and Noise Control Ratings;

4.9.13.1 (7) will ensure that ceiling finishes will comply with and optimize the following criteria as may be relevant to the particular or specific functions of the space:

4.9.13.1 (7) (a) easily cleanable and maintained;

4.9.13.1 (7) (b) flexible and allowing access to the spaces above;

4.9.13.1 (7) (c) compatible with mechanical, plumbing, electrical, and communications services and fixtures;

4.9.13.1 (7) (d) producing low VOC emissions to minimize adverse impact on indoor air quality and indoor environmental quality; and

4.9.13.1 (7) (e) having aesthetic and design qualities to provide a positive environment for students and staff;

4.9.13.1 (8) in situations where an access panel will be located in a wood ceiling, the Design-Builder will ensure that the access panel will match the appearance of the ceiling it is mounted in. Access panels in wood ceilings will be provided by the Design-Builder with a means of visually identifying the panel as approved by the Owner;

4.9.13.1 (9) may include ceiling systems as a component of fire resistance rated separations for areas requiring such separation;

4.9.13.1 (10) will refer to School Room Data Sheets for Ceiling Height requirements. For rooms or areas not addressed in the School Room Data Sheets, Ceiling Height will not be less than 2750 mm above the finished floor in all areas except for the following:

4.9.13.1 (10) (a) in storage rooms and toilet rooms, Ceiling Height will not be less than 2750 mm except that Ceiling Heights in small, normally unoccupied spaces such as storage closets may be reduced to a minimum of 2450 mm;

4.9.13.1 (10) (b) in Gymnasiums, Ceiling Height will not be less than 7340mm;

4.9.13.1 (10) (c) in the School Commons, Ceiling Height will be double height;

4.9.13.1 (10) (d) in the Library Learning Commons, Ceiling Height will not be less than 3050 mm;

4.9.13.1 (10) (e) in Classrooms, Ceiling Height will not be less than 3050 mm;

4.9.13.1 (10) (f) in the Dance Studio, Ceiling Height will not be less than 5485 mm;

4.9.13.1 (10) (g) in Music Rooms (Band, Strings and Choral), Ceiling Height will not be less than 4300mm ;

4.9.13.1 (10) (h) in the Drama Studio, Ceiling Height will be high to accommodate tiered seating and control booth in relation to the stage;

4.9.13.1 (10) (i) in the Art Studio and Ceramic Studio, Ceiling Height will be not be less than 4300mm; and

4.9.13.1 (10) (j) in Wood Workshop, Metal Workshop, Drafting Room/Maker Space, Ceiling Height will not be less than 6000mm; and

4.9.13.1 (11) will design and select ceiling systems and ceiling finishes to comply with the following criteria as may be relevant to the particular or specific functions of the space:

4.9.13.1 (11) (a) cleaning and maintenance;

4.9.13.1 (11) (b) flexibility and access to the spaces above;

4.9.13.1 (11) (c) compatibility with mechanical, plumbing, electrical, communications services and fixtures;

4.9.13.1 (11) (d) low VOC emissions so as to minimize adverse impact on indoor air quality and indoor environmental quality; and

4.9.13.1 (11) (e) aesthetic and design qualities to provide a bright stimulating environment for education.

4.9.14 Floor Finishes

The floor and floor systems will be considered as part of the interior spaces and will be finished to be complementary and integral to the functional and aesthetic requirements of the interior space. The Design-Builder:

4.9.14.1 (1) will select floor finishes will be selected to suit the types of activities and concentration of pedestrian and vehicular/wheel traffic anticipated;

4.9.14.1 (2) will provide floor systems from a manufacturer to suit performance level required and selected from readily available stock;

4.9.14.1 (3) will provide floor finishes as indicated in the School Room Data Sheets;

4.9.14.1 (4) may use flooring designs and patterns as a component of the “wayfinding” system of the Facility; and

4.9.14.1 (5) comply with the following criteria when selecting floor finishes:

4.9.14.1 (5) (a) easily cleanable and maintained finishes;

4.9.14.1 (5) (b) minimize the frequency and ensure the quality of joints and provide ease of replacement if and when required;

4.9.14.1 (5) (c) provide butterfly joints at outside corners of cove base;

4.9.14.1 (5) (d) ensure imperviousness to concentrations of moisture anticipated to be existing on the floors and duration of that moisture;

4.9.14.1 (5) (e) permanence, durability and resistance to concentrated service traffic both pedestrian and vehicular;

4.9.14.1 (5) (f) aesthetic and design qualities to provide a positive environment for students and staff;

4.9.14.1 (5) (g) low VOC emissions so as to minimize adverse impact on indoor air quality and indoor environmental quality;

4.9.14.1 (5) (h) patterns and textures compatible with the requirements for pedestrian safety; and

4.9.14.1 (5) (i) use non-skid flooring in wet areas, wash and change rooms.

4.9.15 Interior Walls and Partitions

The Design-Builder will:

4.9.15.1 (1) provide acoustic separations as required for the specific functions to be carried out in the spaces affected in accordance with Appendix 1C – Acoustic and Noise Control Ratings;

4.9.15.1 (2) provide separations required for fire safety and protection;

4.9.15.1 (3) ensure seismic resistance capabilities will conform to the requirements of CSA S832-06 Guidelines for Seismic Risk Reduction of Operational and Functional Components of Buildings and the VBBL;

4.9.15.1 (4) design and select the interior materials such that it reduces opportunities for vandalism and graffiti;

4.9.15.1 (5) provide materials including exposed concrete and masonry, with coatings to resist graffiti and enable efficient cleaning.

4.9.15.1 (6) provide full height ceramic tile walls to underside of a drywall ceiling in gymnasium locker rooms, change rooms, washrooms and showers to avoid vandalism;

4.9.16 Display Cases

The Design-Builder will provide a variety of secure display opportunities for student work and/or sports trophies, of the typologies and at the locations set out in the Functional Program.

4.10 Interior Design

4.10.1 The Design-Builder will:

4.10.1.1 (1) ensure the interior design reflects the value of the Facility;

4.10.1.1 (2) provide a distinct character of the Facility which relates to its purpose and the Owner, students, staff and the community using the facility; and

4.10.1.1 (3) ensure the interior design meets the requirement for next generation secondary school educational Facility.

4.11 Exterior Spaces

4.11.1 The Design-Builder will provide exterior public spaces that:

4.11.1.1 (1) welcome and engage visitors, students, and staff; main entrances that are easily identifiable;

4.11.1.1 (2) provide protection from sun, wind, rain and polluted air produced by roadways and parking areas;

4.11.1.1 (3) have visual appeal throughout the year;

4.11.1.1 (4) are safe, with visible areas with lighting and seating for visitors and discharged students waiting for transportation. Refer to Appendix 1I – Electrical Standard for recommended target illuminance values for exterior covered areas and entrances, exterior perimeter walkways and exterior parking areas;

4.11.1.1 (5) provide a safe, and well-lit space design for individuals in wheelchairs, and planned in conjunction with other exterior waiting areas;

4.11.1.1 (6) locate trees, lighting and other elements to support wayfinding through the Site, with particular emphasis on building entrances;

4.11.1.1 (7) incorporate principles of CPTED;

4.11.1.1 (8) create a pedestrian and bike-friendly environment, especially along sidewalks, crosswalks, and pedestrian and bike paths;

4.11.1.1 (9) use durable material that are resistant to damage from heavy use and vandalism;

4.11.1.1 (10) provide skateboard deterrents as part of the landscape design. Owner requirement is for cast-in elements; and

4.11.1.1 (11) provide exterior rooftop play area for the Childcare Centre in accordance with Appendix 1E – Childcare Centre Requirements.

4.12 Circulation and Adjacencies (Pedestrian, Bicycling, and Vehicular)

4.12.1 Pedestrian Walkways

The Design-Builder will:

4.12.1.1 (1) integrate pedestrian circulation throughout the Site in a way that minimizes conflict with vehicles and bicycle zones between the surrounding roads and major entrances;

4.12.1.1 (2) design Accessible/Barrier-Free pathways to provide access to all exterior spaces and to all entrances and exits, all exterior and outdoor recreation areas, to the Existing School;

4.12.1.1 (3) ensure that pathway lighting levels will correspond with the use of a given area, and proximity to classrooms;

4.12.1.1 (4) configure pathways and sidewalks to provide maximum amount of natural visual surveillance;

4.12.1.1 (5) differentiate pedestrian walkways from driveways / drive aisles with design elements including the use of different materials;

4.12.1.1 (6) provide non-skid walking surfaces and gentle grades free of uneven joints, and other tripping hazards; and

4.12.1.1 (7) provide continuous concrete sidewalks to meet the following requirements:

4.12.1.1 (7) (a) in front of the Facility, provide a minimum four metre depths, for length of the school front façade a continuous concrete sidewalk for students to gather;

4.12.1.1 (7) (b) include sitting areas complete with skateboard and graffiti resistant benches;

4.12.1.1 (7) (c) sidewalks at the front façade of the Facility will connect to the existing sidewalks;

4.12.1.1 (7) (d) sidewalk will have a minimum 150mm concrete curb with let downs to allow for accessibility;

4.12.1.1 (7) (e) sidewalk in front of the Facility will have bollards that include lighting;

4.12.1.1 (7) (f) the school bus pick-up and drop-off layby will be designed to accommodate three (3) buses stationed at the same time and will be parallel to the driveway running at the north south direction (parallel to the Facility). The nominal bus dimensions are 6100mm (20 feet) long and 2440mm (8 feet) wide. The driveway adjacent to the bus layby must be wide enough to allow a bus to pass by when there is another bus parked in the layby. The design of the layby will include a continuous sidewalk, 4 metres wide complete with landscape and trees (minimum eight trees spaced equally apart) and 150mm curbs with bollards and lights; and

4.12.1.1 (7) (g) all sidewalks will have a maximum grade of 5% with a cross slope maximum of 2%.

4.12.2 Vehicular Access and Parking

The Design-Builder will:

4.12.2.1 (1) provide on-site parking that at minimum meets the requirements set out in this Schedule;

4.12.2.1 (2) provide primary vehicle access from W 33rd Avenue;

4.12.2.1 (3) ensure no vehicular access or exits are provided from Oak Street;

4.12.2.1 (4) ensure intergrade access to parking with the design of the Facility;

4.12.2.1 (5) provide one main vehicle aisle that meets the following requirements:

4.12.2.1 (5) (a) provide traffic calming strategies including speed bumps (minimum four speed bumps) to limit speed on site;

4.12.2.1 (5) (b) provide layby at the recycling/garbage enclosure;

4.12.2.1 (5) (c) provide access to the receiving area;

4.12.2.1 (5) (d) provide multiple access to the parking lanes as required by the design;

4.12.2.1 (5) (e) provide 25 lay-by spaces for parent PUDO accessed by a drive aisle of sufficient width for 2 way traffic and located parallel to W 33rd; and

4.12.2.1 (5) (f) provide 21 lay-by spaces on the south side of the parking area on Site to allow for safe parent PUDO;

4.12.2.1 (6) integrate vehicular circulation with layout of pedestrian and bicycle;

4.12.2.1 (7) ensure zones throughout the Site to provide visible connections, to promote safe travel, and to minimize conflict between vehicles and other modes of travel;

4.12.2.1 (8) plan and delineate pedestrian, cyclist, truck and vehicular traffic with landscape and painted line to outline pathways and identify crossing areas;

4.12.2.1 (9) provide on-site parking and circulation to minimize potential traffic conflicts at heavy traffic periods on site;

4.12.2.1 (10) provide paved service lane access on the south side of the Facility serving all locations requiring delivery and receiving of bulk items;

4.12.2.1 (11) ensure service lane will be simultaneously multi-functional and aesthetically appealing;

4.12.2.1 (12) ensure access to the service lane will not hinder nor impede any other traffic flow on the rest of the Site;

4.12.2.1 (13) provide turning movements for a 5 ton cube truck demonstrating full access via service lane to areas requiring delivery and receiving without conflict with other vehicular or pedestrian flows;

4.12.2.1 (14) provide unobstructed maneuvering aisles that allow for adequate access to on-site parking, pick-up and drop-off spaces in accordance with the City of Vancouver Parking Bylaw. Maneuvering or drive aisles will not be less than 4 metres wide;

4.12.2.1 (15) provide separate vehicular parking from the pick-up/drop -off area to ensure the traffic flows smoothly;

4.12.2.1 (16) delineate parking spaces will be delineated by line paint markings;

4.12.2.1 (17) integrate parking area within 10 metres of the Facility with landscape buffers complete with trees to provide shade to the lot;

4.12.2.1 (18) provide a minimum of 1 landscape parking island for every 5 parking stalls;

4.12.2.1 (19) minimum dimension of the landscaped parking bovver will be 1.5 metres width and 3.5 metres depth. Trees will be standardized to 1.8 metres;

4.12.2.1 (20) provide safe, convenient parking for student, staff and visitor bicycles, including secured storage as per the COV requirements;

4.12.2.1 (21) provide parking and loading for the Facility in accordance with the COV by-law requirements and COV policies and guidelines, as applicable. The following summary is provided as a general guideline; the Design-Builder is to confirm all requirements and demonstrate compliance with all applicable components of the COV Parking Bylaw and COV policies and guidelines:

Table 1: Required Parking

Component	**Allocation**	**Spaces required**
School Staff	120 staff	112
Childcare Centre	Staff	2
	Parent PUDO	9
	Total	**123**

4.12.2.1 (22) design the parking lot to provide parking for small vehicles in accordance with the COV Parking By-Law, low-emitting and fuel-efficient vehicles, and carpools or vanpools;

4.12.2.1 (23) design for the functional separation of traffic for, visitors and staff, and service vehicles;

4.12.2.1 (24) For garbage enclosure on the Site, the Design-Builder will conform with the following:

4.12.2.1 (24) (a) provide an enclosed lockable garbage, composting and recycling areas dedicated for the School and the Childcare Centre to accommodate the following bins and carts:

Quantity	Description	Size			Use	User
		Length	Width	Height		
1	2 cubic yard bin	1.8M	0.9M	0.9M	Organics	School
1	3 cubic yard Bin	1.8M	1.2M	1.2M	Cardboard	School
3	4 cubic yard Bin	1.8M	2.1M	1.5M	Waste	School
2	69 gallon cart	0.7M	0.6M	1.1M	Organics	Childcare Centre
3	95 gallon cart	0.9M	0.7M	1.2M	Recycling	Childcare Centre
2	2 cubic yard bin	1.8M	1.04M	0.91M	Waste	Childcare Centre

4.12.2.1 (24) (b) situate and enclose the garbage area in order to minimize visual to and odor impact for the rest of the Site;

4.12.2.1 (24) (c) provide 150mm thick sloped reinforced concrete pad for load capacity of minimum 18,140 kg with drain and hose bib;

4.12.2.1 (24) (d) provide minimum gradient of 2% but no greater than 4% at the entrance of the enclosure if the surface around it is not leveled;

4.12.2.1 (24) (e) provide a minimum of 250mm wide, 75mm high curb along interior walls or 150mm diameter bollards to prevent wall damage; and

4.12.2.1 (24) (f) provide double swinging gate with bollards or J-hooks at front of enclosure to provide a minimum of 120 degree swing area and a minimum, unobstructed inside opening of 3.6 metres. J-hooks will be installed to securely fasten open gate;

4.12.2.1 (25) situate and enclose the garbage area in order to minimize visual to and odor impacts for the rest of the Site;

4.12.2.1 (26) provide fixed foundation slab, sloped to drain, hose bib, to support garbage, composting and recycling containers; and

4.12.2.1 (27) remove the existing vehicular access at Oak Street and provide a new curb, boulevard, planting and sidewalk infil as required to match existing curb, boulevard, planting and sidewalk.

4.12.3 Bicycle access, storage and showers

Bicycle routes will provide connections between the surrounding roads and major entrances to the Facility. The Design-Builder will:

4.12.3.1 (1) provide well-lit secure and covered enclosure for bicycle locking/parking. Refer to COV Parking By-Law and COV policies and guidelines;

4.12.3.1 (2) provide 76 Class A and 102 Class B exterior bicycle storage facilities configured in accordance with the COV Parking Bylaw and COV policies and guidelines. The final bicycle parking analysis is to be confirmed by the Design-Builder;

4.12.3.1 (3) provide four configure the Class A bicycle storage facilities into groups of covered, secured, access controlled long term bicycle parking enclosures which hold a minimum of 19 bicycles each. The enclosures will have a roof and non-climbable walls that allow visibility to the interior. Enclosure walls will be constructed to resist cutting with metal cutter. Chain link fence are not acceptable for the enclosure walls;

4.12.3.1 (4) locate the Class A bicycle storage facilities on the site in convenient proximity to bicycle access routes. Class A bicycle storage facilities are not allowed in the Oak Street and W 33rd Avenue setbacks;

4.12.3.1 (5) locate Class B bicycle storage facilities (bicycle racks) in convenient proximity to Facility entrances and bicycle access routes;

4.12.3.1 (6) ensure minimum one grouping of bicycle parking to be visible from administration office reception area, with remaining grouping able to be passively supervised from the School; and

4.12.3.1 (7) for each sex, provide all end-of-trip facilities including but not limited to water closets, wash basins, showers, and grooming stations for staff as required by the City of Vancouver parking by-law in addition to any program space stipulated within the Functional Program.

4.13 Landscape Design Principles

4.13.1 The Design-Builder will provide a landscape design for the Facility that:

4.13.1.1 (1) responds to and uniquely balances the overall functional requirements of the Facility, the architectural character of surrounding buildings, and the local context of the surrounding neighbourhoods with function, safety and character;

4.13.1.1 (2) plays an important role in supporting “outdoor learning” environments and includes places for such activities, including flexible/open space for occasional outdoor classroom events or sessions;

4.13.1.1 (3) will have a balance of soft and hard physical landscaping that supports the functional element of the Facility, but also provide relief for students during School breaks;

4.13.1.1 (4) will create physical and aesthetic connections between indoor and outdoor environments and a unity between the architectural and landscape architectural design through layout, geometry, and material and furnishing selection;

4.13.1.1 (5) provide outdoor environments that encourage and make it easy for students and staff to go outside;

4.13.1.1 (6) provide pedestrian focused, comfortable and safe access connecting all the various outdoor amenities on the Facility grounds, including to and from obvious points of egress to the surrounding community;

4.13.1.1 (7) supports the use of sustainability as a subject for education, the design will incorporate innovative design elements that showcase sustainability and offer learning opportunities for students. Such features to include rain gardens, bioswales, or other similar sustainable development features;

4.13.1.1 (8) specify planting for screening of visually unattractive elements (including utilities and their features, loading docks, ramps, garbage/recycling enclosure) and coordinate elements into landscape design with paving, lighting, furnishings and any other features developed for the Facility to improve the overall impact of the utilities and Facility on the Site character;

4.13.1.1 (9) supplement the transportation requirements of the Facility, including supporting wayfinding, supporting traffic calming elements and delineating pedestrian versus vehicular areas at various interfaces; and

4.13.1.1 (10) provide an outdoor patio/terrace for the art studio and science curriculums for outdoor experiments, learning, sketching and painting.

4.14 Wayfinding and Signage

4.14.1 Principles of Wayfinding and Signage

The Design-Builder will:

4.14.1.1 (1) comply with allowable VOC levels for all adhesives, sealants, paints and other coatings as outlined in the LEED reference documents;

4.14.1.1 (2) provide a simple configuration of the Facility's circulation systems and functions so that wayfinding is intuitive and easy;

4.14.1.1 (3) ensure Site circulation that co-ordinates, separates and emphasizes safety in the movements of vehicles (including students, staff and service), bicycles, pedestrians and wheelchairs;

4.14.1.1 (4) provide significant recognizable, easily named and identified elements in key and easily found locations that can become 'meeting points' for students, staff and visitors;

4.14.1.1 (5) design the public elevator and stair lobbies and public circulation routes to be distinct from service routes from other non-public routes;

4.14.1.1 (6) provide all internal and external signage required for building operations;

4.14.1.1 (7) design signage such that the materials, colours, letter fonts, sizes and other aesthetic and functional considerations, such as Braille and other tactile signage, conform to the overall wayfinding design system;

4.14.1.1 (8) ensure all major directional signage, departmental signage, and signage for the major spaces (such as Athletics Department, Library Learning Commons, Fine Arts , Administration, Health, Counseling, and International Education, Auditorium, etc.) are bilingual with hən̓q̓əmin̓əm̓ and English. The hən̓q̓əmin̓əm̓ language and symbols will be incorporated into the wayfinding design. Exact details will be reviewed by the Owner during Design development phase;

4.14.1.1 (9) provide signage that is resistant to graffiti and physical damage;

4.14.1.1 (10) use international symbols where and as applicable;

4.14.1.1 (11) orient all building plan directories to reflect the direction from which they are viewed;

4.14.1.1 (12) provide signage that is clearly visible day or night (illuminated);

4.14.1.1 (13) avoid multi-layered naming hierarchies and complex numbering systems;

4.14.1.1 (14) use the following room numbering system:

4.14.1.1 (14) (a) Ground Floor start at #001;

4.14.1.1 (14) (b) Main Floor starts at 100; and

4.14.1.1 (14) (c) Second floor starts at 200.

4.14.2 Design Requirements

4.14.2.1 (1) The Design-Builder will design the internal directional signs as follows:

4.14.2.1 (1) (a) to include a main directory, installed at the main public entrances to the Facility that indicates the School in relation to Lands;

4.14.2.1 (1) (b) using consistent terminology;

4.14.2.1 (1) (c) door signage to identify every space (e.g. rooms, alcoves, corridors and stairwells) in the School;

4.14.2.1 (1) (d) door signage that is located in a consistent location for every room in the School;

4.14.2.1 (1) (e) door signage that is consistent with the following room numbering protocol:

4.14.2.1 (1) (f) each room has a unique identifier number;

4.14.2.1 (1) (g) labelling anticipates a person attempting to follow numbering along corridors in sequence;

4.14.2.1 (1) (h) blocks of numbers are periodically skipped to allow for future expansion of the numbering system if rooms are added through renovations;

4.14.2.1 (1) (i) review the door numbering system with the Owner and get their approval;

4.14.2.1 (1) (j) ensure corridors have unique numbers which are two digits;

4.14.2.1 (1) (k) ensure stair wells utilize a single digit in each building;

4.14.2.1 (1) (l) use white Helvetica Medium for all lettering, upper and lower case, regardless of method of application or type of sign;

4.14.2.1 (1) (m) ensure that room identification signs, directional signs at elevator/stair landings and in corridors and on-floor identification signs at the main access point to the office are plastic removable insert style, with:

.1 a 3 mm (0.12") black ABS back

.2 a 1.5 mm (0.06") non-glare acrylic face with a vinyl or paint colour accent border on inside surface, fastened to the back with

.3 a continuous strip of 0.8 mm (0.032") double-sided tape at the edge of three sides and

.4 a changeable insert of 0.5 mm (0.02") styrene base/intermediate vinyl surface with lettering reversed out or intermediate vinyl lettering showing styrene as background;

4.14.2.1 (1) (n) provide room identification signs are that are approximately 152 mm x 127 mm (6" x 5") with a corner radius of between 12.7 - 15.9 mm (½" - 5/8"), and fastened by double-sided tape or Velcro, if on fabric office screen;

4.14.2.1 (1) (o) provide directional signs that are of a size sufficient for legibility at the required distances, with corner radius of approximately 19 mm (¾"), two hanger tabs projecting approximately 12.7 mm (½") at the top of the ABS back, and suspended from T-bar ceiling with commercial grade wire hangers and hooks;

4.14.2.1 (1) (p) ensure that main entrance directories are similar to directional signs, but without hanger tabs, and wall mounted where appropriate or to match existing directory as required; and

4.14.2.1 (1) (q) provide washroom doors and doors to stairs with internationally recognized symbols, engraved in 3-ply plastic laminate material, with beveled edges to expose the white core.

4.14.2.1 (2) The Design-Builder will provide external directional signage that:

4.14.2.1 (2) (a) are vandal-proof and installed with an epoxy sealant;

4.14.2.1 (2) (b) clearly indicate access for the public;

4.14.2.1 (2) (c) the Facility exterior signage will clearly indicate access for students and staff and the community, as well as for service providers and suppliers;

4.14.2.1 (2) (d) clearly indicate restrictions to 'after-hours' access and closest accessible entrance;

4.14.2.1 (2) (e) be well illuminated, backlit, reflective or high contrast and easily visible at night, and:

.1 clearly identify the name and address of the School;
.2 minimize light spillage;
.3 indicate the accesses, parking and restrictions for various vehicle types, as required; and
.4 include at least one exterior illuminated sign.

4.15 Ergonomic Design

4.15.1 The Design-Builder will provide an ergonomic design, consistent with Good Industry Practice, of all spaces including millwork, modular casework, furniture, lighting, and finishes to eliminate strain and injury to students and staff.

4.16 Colour

4.16.1 The Design-Builder will provide a school colour scheme that meets the requirements below. The Design-Builder:

4.16.1.1 (1) will review the Special Education program specific colour requirement with the Owner;

4.16.1.1 (2) will choose materials and colour palettes that are durable and do not show dirt, scuffing and marking;

4.16.1.1 (3) in Maintenance, Service and Applied Skills – Industrial Education spaces, will use industrial, commercial grade paint and in colour scheme that hide dirt as well as wear and tear;

4.16.1.1 (4) will use accent colours on areas, such as walls, that are easy to maintain and change for future flexibility;

4.16.1.1 (5) may use coloured glazing, subject to proposed locations and colours reviewed with the Owner;

4.16.1.1 (6) will provide two interior and exterior colour scheme options for Owner's review during design development phase; and

4.16.1.1 (7) will provide anti-glare creating finishes.

PART 5. ENGINEERING DESIGN PRINCIPLES

5.1 Structural Engineering

5.1.1 The Design-Builder will ensure that the structural design and construction administration is performed by and/or under direct supervision of the Structural Engineer of Record, licensed to practice in British Columbia as a Designated Structural Engineer, in accordance with Guidelines for Professional Structural Engineering Services for Part 3 Building Projects by Engineers and Geoscientists BC.

5.1.2 The Design-Builder will ensure that independent review of the structural design is performed by a Professional Engineer, licensed to practice in British Columbia, not involved in the preparation of the structural design, in accordance with Quality Management Guidelines: Documented Independent Review of Structural Designs by Engineers and Geoscientists BC.

5.1.3 The Design-Builder will ensure that field reviews are performed by the Structural Engineer of Record and/or his or her subordinate acting under his or her direct supervision in accordance with Quality Management Guidelines: Documented Field Review During Implementation or Construction by Engineers and Geoscientists BC.

5.1.4 The Design-Builder will design the Facility to the High Importance Category in accordance with VBBL.

5.1.5 The emergency supply building, referenced in Section 3.8.9.1 (1) of this Schedule will be designed by the Design-Builder to Post-disaster Category in accordance with VBBL.

5.1.6 The Facility will be designed by the Design-Builder to support all loads and effects in accordance with VBBL.

5.1.7 The Design-Builder will comply with the following requirements:

5.1.7.1 (1) floors will be designed for a minimum superimposed dead load allowance of 1.0 kPa to allow for partitions, ceilings and mechanical equipment;

5.1.7.1 (2) roofs will be designed for the superimposed dead load of roofing materials, green roofs (if applicable), ceilings, electrical and mechanical equipment, including heat pumps, but will not be less than 1.5 kPa to allow for future re-roofing alternatives;

5.1.7.1 (3) roofs will be designed for snow (including effects of accumulation from various roof elevations and from nearby adjacent structures), rain, wind and occupancy loads (if applicable) specified by VBBL. Notwithstanding other requirements, the minimum live load for design of roofs will be 1.0 kPa; and

5.1.7.1 (4) floors will be designed for loading for the intended use and occupancy and any imposed equipment weights. Unless required by the specific use and occupancy, the following minimum floor design live loads will apply:

5.1.7.1 (4) (a) basement and main (ground) floor: 4.8 kPa minimum;

5.1.7.1 (4) (b) upper floors: 3.6 kPa minimum;

5.1.7.1 (4) (c) mechanical and electrical service rooms: 6.0 kPa;

5.1.7.1 (4) (d) student records storage or compact mobile shelving: 12.0 kPa;

5.1.7.1 (4) (e) Library Learning Commons and Reading Room: 7.2 kPa;

5.1.7.1 (4) (f) other storage: 4.8 kPa;

5.1.7.1 (4) (g) exits and fire escapes: 4.8 kPa;

5.1.7.1 (4) (h) foyers, corridors and aisles: 4.8 kPa;

5.1.7.1 (4) (i) kitchen: 4.8 kPa;

5.1.7.1 (4) (j) Multi-purpose: 4.8 kPa;

5.1.7.1 (4) (k) Dance, Drama, Music studios: 4.8 kPa;

5.1.7.1 (4) (l) Gymnasium, Yoga Studio: 4.8 kPa;

5.1.7.1 (4) (m) change and locker rooms: 4.8 kPa;

5.1.7.1 (4) (n) Weight room: 7.2 kPa minimum;

5.1.7.1 (4) (o) Home Economics Lab and storage: 4.8 kPa;

5.1.7.1 (4) (p) Industrial Education spaces and storage: 7.2 kPa minimum;

5.1.7.1 (4) (q) School Store: 4.8 kPa; and

5.1.7.1 (4) (r) Auditorium & Supporting Spaces: refer to Appendix 1J – Auditorium Specifications.

5.1.8 The Design-Builder will design the Facility to readily accommodate renovations for changes in use and occupancy and changing technology, equipment, and building services, as well as the following requirements:

5.1.8.1 (1) the floor structure will be designed with a minimum of one 150mm diameter knock-out opening on two sides of each column, interior and exterior, for future use and the knock-out openings will be in addition to any openings required for current services; and

5.1.8.1 (2) the Design-Builder will select a structural system that will readily accommodate future changes for similar design load parameters without the addition of structural members.

5.1.9 Deflection Limitations

The Design-Builder will:

5.1.9.1 (1) design the structures to minimize the effects of deflection both short and long term, including any specific deflection requirements for specialty equipment and compatibility with architectural finishes and cladding system;

5.1.9.1 (2) design the structures to meet, as a minimum the deflection limits of the VBBL and the applicable material standards and as appropriate for the non-structural components of the Facility;

5.1.9.1 (3) ensure the deflection limit will not exceed the levels specified in this section;

5.1.9.1 (4) for concrete floor or roof construction, ensure that the maximum deflection occurs after the attachment of non-structural components, including creep deflection due to sustained load plus live load deflection, not exceeding span/360 and total short and long-term deflection will not exceed span/240;

5.1.9.1 (5) for steel floor construction, ensure that the maximum live load deflection will not exceed span/480 with the total load deflection not exceeding span/360. The total load deflection will include effects of shrinkage of concrete topping slabs;

5.1.9.1 (6) for steel roof construction, ensure that the maximum live or snow load deflection will not exceed span/360 and the total load deflection will not exceed span/240; and

5.1.9.1 (7) for wood floor or roof construction, ensure that the maximum live or snow load deflection will not exceed span/360 and the total load deflection will not exceed span/240.

5.1.10 Vibration Limitations

The Design-Builder will:

5.1.10.1 (1) design the structural systems to minimize the effects of floor vibration arising from equipment, human movement and rhythmic activities. Vibration will be limited to acceptable levels for the use and occupancy of the floors. When a floor bay contains a space with a source of vibration shared with a space having a more stringent requirement, the more stringent requirement shall apply to both spaces. All such conditions shall be reviewed by the acoustic and vibration consultant and mitigation design and detailing shall be directed by that consultant;

5.1.10.1 (2) in areas where vibration-sensitive equipment will be installed, design the structural system to limit vibration in accordance with the manufacturer specification for that equipment;

5.1.10.1 (3) mount machinery that could be a source of vibration using vibration isolation techniques;

5.1.10.1 (4) ensure floor system vibration characteristics are in accordance with the User's Guide – NBC Structural Commentaries or other accepted industry standard, such as ASHRAE Handbook Chapter 48 or AISC Design Guide 11;

5.1.10.1 (5) upon completion of the structures and application of any architectural finishes that may dampen vibrations, any vibration resulting from equipment, human movement or rhythmic activities deemed noticeable or cause of annoyance during the warranty period shall be tested by the Owner in

accordance with ISO 2631-2 2003 at the Owner's expense. No space shall experience a vibration velocity in excess of four-hundred (400) micrometers per second on the One-Third Octave Band Center Frequency as measured in Hertz. Should the vibration velocity be in excess of the stipulated criteria, the Design-Builder will reimburse the Owner for the cost of the initial test(s). The Design-Builder will correct any such deficiencies, and will provide for re-testing of affected spaces demonstrating satisfaction of stipulated criteria at no additional cost to the Owner;

5.1.10.1 (6) select and design floor structural systems to have a vibration acceleration maximum limit of 0.5%g with a damping ratio appropriate to the function of the structural bay per standards outlined in Section 5.1.10.1(2) of this Schedule, but in no case greater than 0.02, when an excitation force of 0.29 kN is applied; and

5.1.10.1 (7) not place any mechanical equipment directly above the Drama Studio and associated Control Room; above the Stage, Audience Chamber, or Control Rooms of the Auditorium; nor shall any equipment be mounted above any roof beams that are shared with those spaces. Refer to Appendix 1J – Auditorium Specifications.

5.1.11 Durability

The Design-Builder will:

5.1.11.1 (1) design the Facility structure in accordance with the VBBL, the applicable material standards, and CSA S478;

5.1.11.1 (2) provide a design of the Facility structure and structural components that will minimize effects of corrosion and deterioration due to environment and use in accordance with the following:

5.1.11.1 (2) (a) adequate concrete and masonry crack control joints and expansion/contraction joints;

5.1.11.1 (2) (b) caulk exposed joints;

5.1.11.1 (2) (c) concrete mixes proportioned to CSA A23.1/A23.2 durability requirements for appropriate exposure class;

5.1.11.1 (2) (d) reinforce concrete and masonry for crack control, repair all cracks exposed to public view and within service areas and repair cracks exceeding 1.5mm in width at all other areas;

5.1.11.1 (2) (e) chamfer corners of exposed concrete where possible;

5.1.11.1 (2) (f) exterior exposed steel will be hot-dip galvanized;

5.1.11.1 (2) (g) exterior exposed wood will be pressure treated or of highly decay resistant species, e.g. Alaskan Yellow Cedar;

5.1.11.1 (2) (h) floor subjected to vehicle traffic will be designed to CSA S413.

5.2 Mechanical Engineering

5.2.1 The Design-Builder will meet the following operational and maintenance objectives:

5.2.1.1 (1) fully automated systems with freeze protection programming incorporated;

5.2.1.1 (2) systems capable of being run in manual mode when required;

5.2.1.1 (3) main building functional areas individually zoned for operation;

5.2.1.1 (4) occupied areas equipped with manual 2-hour override switches to provide heating/cooling/ventilation outside of normal operating hours;

5.2.1.1 (5) systems with “hand/off/auto” control on all components;

5.2.1.1 (6) Facility designs that do not require 24/7 operation of the HVAC system;

5.2.1.1 (7) equipment where parts and components are widely available in common sizes and do not use proprietary/rare/niche components (e.g. non-standard filters); and

5.2.1.1 (8) systems that can be readily maintained by the trades and skills currently existing within the Owner.

5.2.2 The Design-Builder will:

5.2.2.1 (1) design the HVAC, plumbing and fire protection systems to provide a comfortable and productive environment for the Facility students, staff and visitors;

5.2.2.1 (2) provide mechanical, plumbing and fire protection systems that will minimize impact on the natural and physical environment, through energy efficiency, optimization of resource use, and simplification of the systems;

5.2.2.1 (3) provide mechanical, plumbing and fire protection systems that are reliable for continual operation;

5.2.2.1 (4) provide water, sanitary, storm and gas utilities as required and sized to suit the consumption and discharge needs of the Facility, including allowances for future expansion;

5.2.2.1 (5) ensure that water, glycol and other fluids used within mechanical systems are treated to prevent corrosion, algae growth, build-up of deposits, disease, bacteria and will prolong the equipment life;

5.2.2.1 (6) ensure that all mechanical, HVAC, plumbing and fire protection systems are vibration isolated to minimize noise and vibration through the structure or other components of the Facility;

5.2.2.1 (7) insulate all pipes, ducts and fittings to conserve energy, prevent condensation, attenuate noise and prevent accidental burns;

5.2.2.1 (8) ensure all mechanical equipment will be controlled through the BMS;

5.2.3 Primary source of heating to the School will be an air source heat pump. The maximum heating water supply temperature will be 45°C. The Design-Builder will size the heat pump to meet a minimum of 33% of the peak heating demand for the School and will ensure that supplementary and back-up heating is provided by condensing gas fired boilers.

5.2.4 The Design-Builder will ensure that cooling is provided to achieve the maximum room temperatures given in the Childcare Centre Room Data Sheets and School Room Data Sheets. Free cooling will be available when outdoor temperatures allow. Cooling is not required for circulation areas provided that they are ventilated by relief air transferred from rooms which have cooling. If the design of the Facility includes circulation areas where space temperatures could be above 30ºC due to high solar gains, then cooling shall be provided to maintain a maximum temperature of 26ºC.

5.2.5 The Design-Builder will ensure that domestic hot water generation is provided by on-demand gas fired condensing water heaters. The Design-Builder may use either distributed or centralised strategies. The Design-Builder will:

5.2.5.1 (1) locate centralized systems in mechanical rooms; and

5.2.5.1 (2) locate decentralized systems in janitors' closets or dedicated service rooms, and when water heaters are located in janitors closets, the Design-Builder will increase the room size to allow space for mounting of the water heater and maintenance service access without affecting the function of the room and the storage space for custodial supplies.

5.3 Electrical Engineering

The Design-Builder will:

5.3.1 provide electrical and telecommunications service to the new school and coordinate as required with applicable third-party utility providers to ensure all applicable requirements are met;

5.3.2 ensure that all electrical components of one system will be provided from one manufacturer, unless otherwise previously authorized by the Owner or Owner's Consultant. Lighting fixtures may be from more than one manufacturer;

5.3.3 ensure that on-site roadways, walkways and vehicle and bike parking areas are lit during darkness to ensure safe vehicle, pedestrian, and bike traffic in respect to collisions, personal safety, and Facility access and egress;

5.3.4 provide energy efficient and environmentally friendly lighting;

5.3.5 design lighting controls for flexibility and ease of operation;

5.3.6 utilize daylight harvesting and achieve energy savings via automatic dimming within the area;

5.3.7 provide local override for daylight harvesting in each room utilizing daylight harvesting;

5.3.8 ensure lighting controls meet all requirements of ASHRAE 90.1 2016;

5.3.9 design power distribution systems for flexibility and provide spare capacity for future loads;

5.3.10 locate major equipment such as high voltage equipment, distribution switchboards and transformers in secure service rooms;

5.3.11 provide energy metering that meets the requirements of ASHRAE 90.1 2016; and

5.3.12 ensure all wiring in finished areas are concealed.

5.4 Civil Engineering

5.4.1 General Requirements

The Design-Builder will:

5.4.1.1 (1) provide, as necessary, adequate and reliable infrastructure and necessary municipal services to the Facility. All municipal services and offsite works will conform to the COV engineering regulations and requirements;

5.4.1.1 (2) be responsible for all on-site works required for excavation, exposing, removal of buried structures, backfill and surface restoration of all proposed water, storm and sanitary sewer, gas, power and communication ducts, as well as the connection of each service to the municipal system;

5.4.1.1 (3) be responsible for the design and construction of all off-site works and services located outside the boundaries of the Lands, including any work located in COV easements and statutory rights-of-way, as determined by the COV, utility company and/or other approving authority having jurisdiction, as either being required to support the Facility or a mandatory condition of development approval, including all off-site works and services include any underground storm, sanitary, and water services, fire hydrants, utility company services (BC Hydro, Fortis BC, Telus, COV electrical, telephone and communication), roadworks (including pavement, curbs, sidewalks, street lighting, and street trees);

5.4.1.1 (4) design and construct all on-site works in accordance with the latest edition of the MMCD and VBBL;

5.4.1.1 (5) design and construct all offsite works and upgrades in accordance with the latest COV's Bylaws, Utilities Design and Construction Manual and all other requirements of the COV to secure approval of appropriate permits;

5.4.1.1 (6) design all works and services for convenient maintenance access and to minimize maintenance costs;

5.4.1.1 (7) design traffic loading for cleanouts, and lids for underground utilities in drivable pavement areas to Canadian Highway Bridge Design Code design load CL-625;

5.4.1.1 (8) ensure all utility separations, (onsite and offsite) will adhere to COV and third party utility requirements;

5.4.1.1 (9) protect and/or relocate existing utilities which service the Existing School as required for the duration of construction and to allow for the footprint of the Facility;

5.4.1.1 (10) ensure that the Existing School services will remain functional and uninterrupted until the proposed services are connected and upon completion of the Facility. Existing services are then to be capped/removed as it may be required by COV Engineering;

5.4.1.1 (11) design roads and fire access routes for a 20-year life span;

5.4.1.1 (12) coordinate all the deep and shallow underground utility lines with the requirements of landscape planting design.

5.4.2 Watermain and Appurtenances

The Design-Builder will:

5.4.2.1 (1) provide a watermain system capable of providing domestic and firefighting capacity for the Facility;

5.4.2.1 (2) provide one new domestic water service connection to the Facility from the municipal system capable of providing all required institution demands and one new fire water service connection for firefighting capacity and redundancy for the Facility. The extent to which provision for on-site pumping will be required (to suit either domestic demand or fire-fighting demand, or both) will be determined, in part, by the available system pressures, the final Facility floor area and Facility height;

5.4.2.1 (3) provide domestic water meter and reduced pressure backflow preventer(s) to protect the municipal system and onsite facilities from contaminants in conformance to the COV Waterworks Standard;

5.4.2.1 (4) provide adequate fire hydrants around the Site in accordance with NFPA-24 and the COV's Fire Department requirements;

5.4.2.1 (5) provide a watermain system of diameter, grade and depth material and restrain mechanisms to safely meet the demand and fire flow requirements;

5.4.2.1 (6) provide a water system that includes pipes, valves, hydrants, fittings and all other required appurtenances;

5.4.2.1 (7) calculate firefighting volumetric demands using the FUS method, unless alternates are otherwise approved by the applicable authority having jurisdiction; and

5.4.2.1 (8) if required to meet the FUS fire flow demands, provide back-up permanent fire-fighting equipment.

5.4.3 Sanitary Sewer

The Design-Builder will:

5.4.3.1 (1) provide a sanitary sewer system including the pipes, manholes, quality testing and all other required appurtenances and designed as a gravity system with no requirement of a lift station;

5.4.3.1 (2) provide sanitary sewer service of diameter, grade and depth to safely convey all effluent from the Facility and connect to the appropriate COV system; and

5.4.3.1 (3) re-route, remove and dispose of offsite all existing abandoned and/or redundant sewers or other utilities beneath the Facility footprint.

5.4.4 Storm Sewers and Drainage

The Design-Builder will:

5.4.4.1 (1) provide a sewer system including the pipes, manholes, backflow prevention mechanism and all other required appurtenances and designed as a gravity system with no requirement of a lift station or pumping;

5.4.4.1 (2) ensure that flooding/ponding do not occur within the Site;

5.4.4.1 (3) provide a stormwater management plan, utilizing best management practices for stormwater management, coordinated with and complying with the bylaw requirements of COV;

5.4.4.1 (4) provide storm sewers, stormwater management strategies and drainage network (minor and major) to meet the requirements of the COV and,

5.4.4.1 (4) (a) where “minor system” is defined as a piped storm conveyance system and “major system” is defined as the combination of piped systems, channels, retention or detention basins, roadways and overland flow routes, of a size, grade, material and depth to safely convey and manage all storm water on-site to the receiving system, include storm water oil and grit separation devices or other water quality treatment devices for capturing and treating runoff from all road and parking area surfaces capable of removing minimum 85% total suspended solid as per the COV bylaw requirements; and

5.4.4.1 (5) provide storm sewer service from the Facility with treatment and discharge to the on-site storm sewer system. Proposed storm system must connect to the appropriate COV system, and connection works shall be coordinated with COV, as required.

5.4.5 Roadworks

The Design-Builder will:

5.4.5.1 (1) design access roadways with longitudinal gradients that allows emergency vehicle to manoeuvre within the Site without overhanging and/or bottoming out;

5.4.5.1 (2) ensure that parking areas and drive aisles have minimum and maximum cross-falls of 2% and 5% respectively;

5.4.5.1 (3) ensure all on-site road works will meet the requirements of the standards and guidelines of the Geometric Design Guide for Canadian Roads, as published by the TAC;

5.4.5.1 (4) design and construct on-site roadways, including the pavement, curbs and gutters, sidewalks, walkways, signage, pavement markings, lighting and traffic calming devices that are Accessible/Barrier-Free and provide safe passage between parking areas, loading areas, emergency vehicle areas and drop off areas without requiring the driver to enter the municipal roadway;

5.4.5.1 (5) upgrade offsite sidewalk along the south side of W 33rd Avenue, starting from Laurel St existing curb line to Oak Street. New sidewalk will include the concrete pavement, curbs and gutters, and landscape buffer that will integrate existing structures such as lighting, trees, signage, poles, and hydrants. Works may include new asphalt extension to new curb limit, as required. The Design-Builder will be responsible for the cost of the COV work and for arranging and coordinating the offsite works with the COV as required;

5.4.5.1 (6) ensure that the concrete and asphalt pavement structure meets a geotechnical engineer's recommendations;

5.4.5.1 (7) use Site surfacing materials which will meet intended use and minimize the 'heat island' effect;

5.4.5.1 (8) provide for on-site roadways to account for snow removal machinery and methods in winter snowfall months;

5.4.5.1 (9) ensure roadways and paved areas have positive drainage to shed rainwater quickly to a storm drainage facility;

5.4.5.1 (10) avoid surface water ponding;

5.4.5.1 (11) design pedestrian walkways with longitudinal gradient no greater than 5% and with maximum cross-fall of 2%;

5.4.5.1 (12) ensure all pathways to entrances are concrete or asphalt paving;

5.4.5.1 (13) ensure on-site pathways, sidewalks, cross walks and associated signage adhere to MMCD the VBBL requirements, latest edition;

5.4.5.1 (14) provide required painted pavement markings and symbols including: parking stall lines, stop lines, lane lines, pickup and drop off area demarcation, loading area demarcation, universal handicap parking space symbols, cross walk markings, directional arrows and any other delineations required for control and safety of vehicle and pedestrian movements; and

5.4.5.1 (15) provide temporary and permanent painted pavement markings in accordance with the latest edition of TAC “Manual of Uniform Traffic Control Devices for Canada” and applicable sections of MMCD, latest edition.

5.4.6 Gas Service

The Design-Builder will:

5.4.6.1 (1) provide natural gas service to the Facility; and

5.4.6.1 (2) coordinate as required with third party utility providers for design requirements and constructability including metering.

PART 6. TECHNICAL SPECIFICATIONS

6.1 Demolition of Existing Running Track and Seating

The Design-Builder will:

6.1.1.1 (1) undertake the demolition work in a safe manner in accordance with the Work Plan, COV requirements, the VBBL and the WorkSafe BC Industrial Health and Safety Regulation. The demolition work will include removal of the existing running track, long jump, seating and the existing emergency supply container, which is identified in Schedule 9 – Site Plan;

6.1.1.1 (2) provide a superintendent of work who will be present during the demolition work, thoroughly familiar with the demolition work required and direct the demolition work;

6.1.1.1 (3) select, retain, store and reinstall other materials or equipment not specifically described but required for the proper completion of the Work, subject to approval by the Owner; and

6.1.1.1 (4) be responsible for materials demolished in accordance with this Schedule, which unless shown, noted or specified otherwise, will become the property of the Design-Builder and will be removed from the Site and disposed of in a legal manner.

6.2 Concrete (Division 3)

The Design-Builder will:

6.2.1 design and construct cast-in-place concrete of appropriate properties for the intended use in accordance with the requirements of all applicable standards and specifications, including CSA A23.3;

6.2.2 design and construct precast concrete of appropriate properties for the intended use in accordance with the requirements of all applicable standards and specifications, including CSA A23.4 and the PCI Design Handbook, under direct supervision of a professional engineer registered in the Province of British Columbia, experienced in design of precast concrete structural units;

6.2.3 ensure that the manufacturing of structural and architectural precast concrete products will be from a production facility certified under the Canadian Precast Concrete Quality Assurance Certification Program (CPCQA) for the type of product being supplied in accordance with the requirements of CSA Standard A23.4, PCI Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products - MNL-116; PCI Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products – MNL-117;

6.2.4 ensure that concrete reinforcing work will comply with CSA A23.1, and Reinforcing Steel Institute of Canada (RSIC) – Reinforcing Steel Manual of Standard Practice;

6.2.5 ensure that inspection and testing of cast-in-place concrete materials, reinforcing and workmanship is carried out by a testing agency in accordance with CSA A23.1. Non-destructive Methods for Testing Concrete will comply with CSA A23.2;

6.2.6 ensure that inspection and testing of precast concrete materials and workmanship is carried out by the precast concrete contractor as part of its quality control program in accordance with CSA-A23.2;

6.2.7 design and construct floors and roofs to comply with the deflection and vibration criteria outlined in Section 5.1 – Structural Engineering;

6.2.8 finish concrete floors with a smooth, dense, steel trowel finish with a Class A, or Class B where required by manufacturer's specifications for floor finishing, flatness classification in accordance with CSA A23.1, use of overlay topping will be acceptable provided it conforms to CSA 23.1 standard for bonded topping on hardened concrete;

6.2.9 repair cracks in concrete floors and walls to suit the floor finish and long-term serviceability requirements of the floor;

6.2.10 provide foundation drainage using drainpipe system around exterior perimeter of the Facility connected to under-slab drainage;

6.2.11 where groundwater table could be anticipated to rise close to the floor-level of any below-grade occupied space, ensure that concrete walls and slabs of that space are water-proofed to prevent groundwater ingress. Construction joints will have purpose-made water stops;

6.2.12 provide sealing compound for polished and/or stained concrete floor to commercial/institutional grade durability;

6.2.13 ensure that polished concrete will be slip resistant at entry doors, wet areas and at any location that could at times be wet;

6.2.14 provide power trowel finish to mechanical and boiler room floors as well as shops and other areas specified in the School Room Data Sheets;

6.2.15 rub exposed sharp edges of concrete at columns and walls with Carborundum to produce flush surfaces or 3mm radius edges unless otherwise detailed;

6.2.16 ensure form tie pockets are thoroughly wetted and patched with patching concrete following by proper curing;

6.2.17 ensure exposed concrete walls, columns, and beams are filled and sacked;

6.2.18 remove fins and projections;

6.2.19 flush fill all voids and sack the walls; and

6.2.20 ensure exterior and interior exposed concrete walls will receive anti-graffiti finish coating.

6.3 Masonry (Division 4)

6.3.1 Masonry design and construction that meets or exceeds current Canadian standards and practices as set out in this section, may be considered for Facility elements and systems, where appropriate.

6.3.2 Masonry construction may be considered for exterior walls and walls systems where permanence of finishes, both visually and functionally, and ease of maintenance are primary considerations in the exterior fabric of the Facility.

6.3.3 Masonry construction may be considered for interior walls and wall systems when priorities include, permanence and maintenance, sound transmission control, fire resistance and separation requirements and security.

6.3.4 Where use of masonry is exposed, both exterior and interior, surfaces will receive anti-graffiti finish coating.

6.3.5 The Design-Builder will use masonry installers in members in good standing in the CMCA, BC – Yukon Chapter. All installation will conform to technical requirement of CMCA, Canada Masonry Design Centre.

6.3.6 Concrete Unit Masonry

6.3.6.1 (1) Concrete unit masonry may be considered for both independent exterior walls and in exterior wall systems as a structural backing to other finish materials or systems;

6.3.6.1 (2) Concrete unit masonry for interior applications may be considered as an integrally finished material, as a base for applied finish and as a structural backing to other finish systems;

6.3.6.1 (3) The Design-Builder will:

6.3.6.1 (3) (a) ensure concrete masonry units in public areas are painted or honed finish;

6.3.6.1 (3) (b) not use unpainted concrete unit masonry as an exposed finish in public areas;

6.3.6.1 (3) (c) comply with CMCA Masonry Practices Manual, CSA-S304, and CSA-A371;

6.3.6.1 (3) (d) perform sufficient inspection and testing of masonry materials and workmanship sufficiently to confirm conformance with design specifications; and

6.3.6.1 (3) (e) not use split face block;

6.3.7 Brick Masonry

The Design-Builder will:

6.3.7.1 (1) use exterior wall systems comprising brick masonry as a finish veneer as a rain screen;

6.3.7.1 (2) ensure exposed surfaces have anti-graffiti finish coating;

6.3.7.1 (3) provide brick masonry that is smooth faced;

6.3.7.1 (4) not use brick masonry below grade for exterior applications;

6.3.7.1 (5) ensure brick masonry in interior applications will have integral finish and construction compatible to allow maintenance;

6.3.7.1 (6) ensure all units will come from the same batch; and

6.3.7.1 (7) use stainless steel ties and anchors.

6.3.8 Stone Masonry

6.3.8.1 (1) Stone masonry may be considered as a finish veneer to concrete walls or concrete masonry walls. Exterior wall systems in such applications will be a rain screen.

6.3.8.1 (2) Stone masonry joints pattern will be designed in straight joints such as Ashlar.

6.3.8.1 (3) The Design-Builder will:

6.3.8.1 (3) (a) ensure stone will be sound, hard and durable, well-seasoned and of uniform strength, colour and texture, and free of quarry sap, flaws, seams, sand holes, iron pyrites or other mineral or organic defects;

6.3.8.1 (3) (b) not make exterior use of stone as horizontal installation;

6.3.8.1 (3) (c) not use cultured stones.

6.4 Metals (Division 5)

6.4.1 Structural steel, steel deck, and cold-formed steel stud design and construction that meets or exceeds current Canadian standards and practices as set out in this section, may be considered for Facility elements and systems, where appropriate.

6.4.2 The Design-Builder:

6.4.2.1 (1) will design and construct the structural steel, steel deck, and cold-formed steel stud systems to comply with the deflection and vibration criteria outlined in Section 5.1.

6.4.2.1 (2) for steel floor and roof construction, consider the deflection of steel beams, joists, and girders due to the wet weight of concrete topping slabs. Topping slab thickness may have to vary to maintain floor levelness tolerances. The additional concrete ponding weight will be considered in the design of the structure;

6.4.2.1 (3) will ensure concrete topping slabs will be finished with a smooth, dense, steel trowel finish with a Class A, or Class B where required by manufacturer's specifications for floor finishing, flatness classification in accordance with CSA A23.1. The use of overlay topping will be acceptable provided it conforms to CSA 23.1 standard for bonded topping on hardened concrete;

6.4.2.1 (4) will install control joints to prevent excessive cracking in accordance to good practice and CSA Requirements;

6.4.2.1 (5) will pay special attention to crack control of concrete topping slabs on steel deck. As a minimum, the following details and procedures will be implemented:

6.4.2.1 (5) (a) minimize wet weight deflections of steel decking and supporting structure;

6.4.2.1 (5) (b) where practical, place concrete in alternate bays and avoid placing large areas at one time;

6.4.2.1 (5) (c) use concrete topping with a low design slump;

6.4.2.1 (5) (d) add superplasticizer to increase slump for placing and finishing;

6.4.2.1 (5) (e) use 14mm or larger aggregate topping mix;

6.4.2.1 (5) (f) avoid placing topping slabs on hot or windy days;

6.4.2.1 (5) (g) reinforce topping slabs with a minimum 10 metres at 350mm centers each way chaired a minimum 20mm above steel deck;

6.4.2.1 (5) (h) provide extra topping slab reinforcement around openings, columns, and at corners; and

6.4.2.1 (5) (i) wet cure topping slabs for a minimum of three days using soaked burlap covered with polyethylene or similar methods.

6.4.2.1 (6) will repair cracks in concrete topping slabs to suit the floor finish and long-term serviceability requirements of the floor;

6.4.2.1 (7) will ensure steel floor/roof decking will be wide rib profile for ease of attachment of current and future services, equipment, and fixtures using drilled insert expansion anchors into the bottom of the deck ribs;

6.4.2.1 (8) will ensure the steel floor/roof decking plus the concrete topping slab thickness will satisfy the requirements of a ULC-rated assembly meeting the VBBL fire rating requirements;

6.4.2.1 (9) will ensure structural steel floor/roof framing and supporting members will be fire-proofed to meet the VBBL fire rating requirement; and

6.4.2.1 (10) may use spray-on fireproofing where the structural steel is concealed by wall, furring or ceiling.

6.4.3 Structural Steel and Steel Joists

The Design-Builder will:

6.4.3.1 (1) ensure fabricators and erectors are certified by the Canadian Welding Bureau under Division 1 or 2 of CSA-W47.1 Certification of Companies for Fusion Welding of Steel and/or CSA-W55.3 Certification of Companies for Resistance Welding of Steel and Aluminum;

6.4.3.1 (2) ensure design and construction complies with CSA S16 and Canadian Institute of Steel Construction (CISC) Code of Standard Practice;

6.4.3.1 (3) ensure erection tolerances for steel construction are in accordance with CSA S16;

6.4.3.1 (4) ensure workmanship is assured and controlled by an approved testing agency;

6.4.3.1 (5) use testing procedures as specified in CSA S16- to verify soundness of representative shop;

6.4.3.1 (6) use field welds; and

6.4.3.1 (7) ensure that material quality including sourcing and welding quality is controlled by an independent testing agency retained by the Design-Builder.

6.4.4 Load Bearing Steel Studs

6.4.4.1 (1) Load bearing steel studs may be considered as a component of the exterior wall systems to support exterior wall finishes and form an integral part of the building envelope.

6.4.4.1 (2) Load bearing steel studs may be part of the Facility structure or may be independent of the principle Facility structural system.

6.4.4.1 (3) The Design-Builder will:

6.4.4.1 (3) (a) ensure that load bearing steel stud design and construction will comply with CSA-S136;

6.4.4.1 (3) (b) ensure that manufacturer will be certified in accordance with CSSBI – Standard 30M – Standard for Steel Building Systems and CSA-A660 – Certification of Manufacturers of Steel Building Systems;

6.4.4.1 (3) (c) ensure that fabricator and erector will be experienced in the type of work undertaken;

6.4.4.1 (3) (d) conform to the AWCC Manual.

6.4.4.1 (3) (e) limit maximum deflection under specified wind loads to L/360, unless a smaller maximum deflection is specifically required due to wall finishes;

6.4.4.1 (3) (f) design components to accommodate erection tolerances of the structure;

6.4.4.1 (3) (g) design wind bearing stud end connections to accommodate floor/roof deflections and to ensure that studs are not loaded axially; and

6.4.4.1 (3) (h) design steel studs to take into account the anchorage of other materials being supported including: sub-girts supporting metal cladding and composite panels, soffit finishes and the provision of lateral support at window heads.

6.4.5 Miscellaneous Metals

The Design-Builder will:

6.4.5.1 (1) ensure primers and paints of miscellaneous metals used conform to MPI Architectural Specification Standards Manual for premium finish classification;

6.4.5.1 (2) ensure exterior installation, all miscellaneous metal components will be galvanized in accordance to ASTM A153 – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware;

6.4.5.1 (3) repair prefinished galvanized areas affected by on-site installation in accordance with MPI requirements;

6.4.5.1 (4) design metal assemblies to allow for assembly without welding or cutting on-site; and

6.4.5.1 (5) ensure all exterior metal installation including guards, handrails, bollards, fencing, gates, and storage enclosures are galvanized steel sections or chain link as required.

6.5 Wood Plastics and Composites (Division 6)

6.5.1 Millwork and Architectural Woodwork

The Design-Builder:

6.5.1.1 (1) will ensure that wood and plastic products and procedures required in the construction process and as integral components of the Facility fabric, including fabrication, assemblies, surfaces, and finishes, will conform to requirements outlined in Section 2.1 of this Schedule and to those set out in this division;

6.5.1.1 (2) will provide a two (2) year AWMAC guarantee certificate;

6.5.1.1 (3) will provide inspections by an AWMAC certified inspector;

6.5.1.1 (4) will provide as a minimum, millwork as indicated in the School Room Data Sheets;

6.5.1.1 (5) will design millwork will be simple inform and minimal mouldings and trims;

6.5.1.1 (6) will not use products containing added urea formaldehyde in the Facility;

6.5.1.1 (7) will provide rough carpentry, wood backing materials, backing board for mechanical rooms, and electrical/communications rooms (minimum 2400mm (8'-0") AFF);

6.5.1.1 (8) will provide seismic restraints for all millwork and shelving;

6.5.1.1 (9) may use timber, which is an encouraged product for the Facility structure, provided that it is designed and detailed in accordance with the VBBL requirements;

6.5.1.1 (10) will provide finish carpentry and architectural woodwork, including cabinets, casework, frames, panelling, trim, installation of doors and hardware, and other wood-related products and applications, as required for wood products exposed to view in finished interior and exterior installations;

6.5.1.1 (11) will provide plastic laminate surfacing and/or solid polymer fabricated surfacing, as required to create surfaces that require clean characteristics, special or regular maintenance, and resistance to caustic action of chemicals or agents. All Science lab table worktops will be acid resistant surface and finish;

6.5.1.1 (12) will provide acrylic plastic products as required for wall cladding, wall protection, corner protection, casework finishing, trims, ornamental elements, and other applications to achieve a quality of interior finish suitable for use by staff, students and Facility custodians; and

6.5.1.1 (13) will ensure that exterior exposed wood is protected from the elements and is pressure treated;

6.5.1.1 (14) will ensure that design, fabrication, materials, installation, and workmanship of finish carpentry and architectural woodwork will conform to quality standards outlined in Section 2.1, AWMAC Quality Standards Manual (latest edition) for minimum "Custom Grade," and DHI standards. Provider of the products specified in this section will have minimum five (5) years documented experience and be a member in good standing with AWMAC;

6.5.1.1 (15) will ensure that selected material and veneer are consistent throughout the Facility;

6.5.1.1 (16) will use non-toxic, non-solvent glue to comply with AWMAC Quality Standards Manual, Canadian 'Eco-Logo' program Use of Helmitin Helmibond T16 water-bond contact adhesive is recommended;

6.5.1.1 (17) will use marine-grade plywood substrate for counter tops;

6.5.1.1 (18) will not use post formed counter top;

6.5.1.1 (19) will provide backsplash, 100mm finished with same material as the top and provided on all sides against wall and or other surfaces;

6.5.1.1 (20) ensure all exposed or visual surfaces for architectural woodwork and finish carpentry including doors, gables, edges, sides, fronts, inside cupboards has a finished clear fir or white birch veneer finish;

6.5.1.1 (21) will use hardwood plywood that conforms with the following:

6.5.1.1 (21) (a) CSA 0.115-1967, 19mm C2 Whole piece Face (C2WPF) 7 ply NOVA #2SSG OS HPVA HP-1, select natural fir or white birch, good one or two sides as required;

6.5.1.1 (22) will use hardwood lumber that conforms with the following:

6.5.1.1 (22) (a) domestic plywood only (no imported) to comply with National Hardwood Lumber Association requirements, moisture content of maximum 6% for interior work; and

6.5.1.1 (22) (b) select white birch to AWMAC custom grade, selected to match fir or white birch plywood;

6.5.1.1 (23) will install all cabinets filler strip where required and contacts the wall;

6.5.1.1 (24) for the interior trim, will use AWMAC custom grade select natural fir or white birch;

6.5.1.1 (25) for use finish hardware that conforms with the following:

6.5.1.1 (25) (a) to CGSB 69-GP-8M and to match door hardware finish. RPC # 37626D only. Cabinet pulls will be 100 mm rectangular shaped Richelieu #225;

6.5.1.1 (26) install drawer slide (commercial grade full extension) on all drawers, reference product Accuride C38320C20P or acceptable equivalent;

6.5.1.1 (27) use door catches that are (large) Richelieu BP65292G and (small) Richelieu BP6032G or acceptable equivalent;

6.5.1.1 (28) provide radiused corners and edges at exposed plastic laminate;

6.5.1.1 (29) provide cabinet edging that is 3mm PVC-T mold or wood tape or acceptable equivalent;

6.5.1.1 (30) provide cabinets shelves that will be adjustable in height unless specified otherwise. All adjustable shelves will be seismically restrained by the use of notches and surface mounted standards. Shelf standards: KV255 or acceptable equivalent;

6.5.1.1 (31) for cabinets and bookcases with the top less than 1625 mm above finished floor, will ensure that the top surface is finished with plastic laminate or equivalent wearing surface with approval of the Owner and continuous over gable to ensure safety of possible seated person on millwork;

6.5.1.1 (32) ensure all cabinet doors are equipped with locks unless specified otherwise, with the lock to match keying in the classroom door;

6.5.1.1 (33) provide all architectural woodwork hardware including slides, concealed hinges, pulls, shelf standards to heavy duty, commercial grade standards in accordance with AWMAC requirements;

6.5.1.1 (34) provide glass and glazing to CGSB CAN 2-12.3-M76;

6.5.1.1 (35) ensure all exposed exterior natural wood surfaces are coated with an aliphatic urethane coating system acceptable to the Owner;

6.5.1.1 (36) for finishing, ensure that:

6.5.1.1 (36) (a) such finishing is shop finished in accordance with Section 1500 of AWMAC architectural woodwork quality standards. Shelves and drawer front within cabinets will be considered exposed for finish application;

6.5.1.1 (36) (b) the millwork for such finishing is clear finished; and

6.5.1.1 (36) (c) the finish system will be conversion varnish, custom grade.

6.5.1.1 (37) for plastic laminate, conform with the following:

6.5.1.1 (37) (a) to CAN3-A172-M79 1.2 mm thick, (GPR), all smooth finishes;

6.5.1.1 (37) (b) science instruction millwork in classrooms will be acid and chemical resistant; and

6.5.1.1 (37) (c) use Standard Wilsonart laminate (colour Nebula Grey or Black) or acceptable equivalent;

6.5.1.1 (38) provide showcase locks that conform with the following:

6.5.1.1 (38) (a) Hewi or acceptable equivalent;

6.5.1.1 (38) (b) premium track with metal rollers; and

6.5.1.1 (38) (c) track lock and tack finger pulls keyed alike; and

6.5.1.1 (39) design millwork to withstand edge load of 100 kg per lineal metre of counter. All perimeter counters will be floor mounted unless specified otherwise.

6.5.2 Structural Heavy Timber

The Design-Builder will:

6.5.2.1 (1) design and construct in compliance with CSA O86;

6.5.2.1 (2) design exposed natural timber components with consideration for its dimensional instability due to variation in temperature and moisture;

6.5.2.1 (3) apply proven best practices for protection of exposed timber from ultraviolet light and moist degradation; and

6.5.2.1 (4) design and construct floors and roofs to comply with the deflection and vibration criteria outlined in the Section 5.1 – Structural Engineering.

6.6 Thermal and Moisture Protection (Division 7)

6.6.1 The Design-Builder will:

6.6.1.1 (1) design construction assemblies according to the building envelope principles outlined in Part 5 Environmental Separation of VBBL;

6.6.1.1 (2) ensure construction assemblies including roof-mounted equipment prevent the ingress of moisture or water vapour from the exterior into the Facility and the passage of air through the building envelope from the interior spaces to the exterior and vice versa;

6.6.1.1 (3) ensure construction assemblies prevent the ingress of moisture through foundation walls below grade, both subject and not subject to hydrostatic pressure;

6.6.1.1 (4) create comfortable, habitable interior environments by providing protection such as insulation to resist the transfer of heat through exterior walls and roofs;

6.6.1.1 (5) provide resistance to the propagation and spread of fire for exterior walls and interior walls designated as fire-resistance rated separations where required;

6.6.1.1 (6) consider as key factors durability, serviceability and energy efficiency of thermal and moisture protection materials;

6.6.1.1 (7) ensure exterior cladding systems are durable, low maintenance and allow for simple replacement of damaged sections;

6.6.1.1 (8) ensure pre-finished or site applied coatings are durable and fade resistant to limit maintenance over time, metal cladding will be of adequate gauge to resist damage from impact (such as from balls, for instance);

6.6.1.1 (9) use particularly durable materials at ground level installations such as concrete or masonry veneer, complete with anti-graffiti coating;

6.6.1.1 (10) clearly and graphically depict the continuity of the air barrier, vapour transmission retarder (vapour barrier) and weather-tight plane, plus drainage and ventilation of assembly voids, in the working drawings and applicable shop drawings on all envelope sections drawn at a scale of 1:25 or larger, with attention to foundation/wall, roof/wall, window/wall and structure/wall connections;

6.6.1.1 (11) ensure that non-structural components, restraints, and anchorages for such elements as exterior wall assemblies, parapets, canopies, window glass and all other glazing, lay-in tile ceilings, partitions, all indoor and outdoor equipment, in accordance with the requirements of the VBBL are designed by a professional engineer to accommodate dead, live and seismic loads;

6.6.1.1 (12) colours should be selected from manufacturer’s premium and metallic colours. Avoid dark coloured metal panels; and

6.6.1.1 (13) Sabin metal panels will not be acceptable.

6.6.2 Damp proofing

6.6.2.1 (1) The Design-Builder will ensure that the foundation wall surfaces has damp proofing coverage to repel and prevent moisture ingress.

6.6.3 Waterproofing

The Design-Builder will:

6.6.3.1 (1) provide waterproofing to prevent moisture ingress to occupied spaces below grade;

6.6.3.1 (2) use sheet membrane waterproofing to prevent water ingress over suspended slabs and decks and associated walls over occupiable spaces where water collection is anticipated; and

6.6.3.1 (3) provide sheet membrane waterproofing will be provided in exterior walls as part of the building envelope and integral with rain screen or cavity wall assemblies.

6.6.4 Vapour Barriers

6.6.4.1 (1) The Design-Builder will provide a continuous vapour barrier membrane to prevent water vapour transmission and condensation in wall assemblies, roofing assemblies, and under concrete slabs-on-grade within the Facility perimeter.

6.6.5 Air Barriers

The Design-Builder will:

6.6.5.1 (1) design air barrier assemblies to limit air ex-filtration and infiltration through materials of the assembly, joints in the assembly, joints in components of the wall assembly, and junctions with other Facility elements including the roof;

6.6.5.1 (2) ensure air barrier assemblies prevent air leakage caused by air pressure across the wall and roof assembly, including interruptions to the integrity of wall and roof systems such as junctions with dissimilar constructions to the standards as listed above;

6.6.5.1 (3) ensure all components of the air barrier system will withstand imposed loads for the duration of the Facility service life or will be easily maintained. Pay particular attention to structural movement such as thermal expansion and contraction and/or live load deflections; and

6.6.5.1 (4) not use polyethylene sheet with caulking as components of the envelope air barrier system.

6.6.6 Thermal Protection

The Design-Builder will:

6.6.6.1 (1) provide thermal insulation as part of the building envelope to prevent the transfer of heat both from the interior to the exterior and vice versa, dependent on seasonal conditions, and to resist the absorption of water;

6.6.6.1 (2) provide thermal protection materials of a type and quality that will provide consistent environmental quality to enclosed spaces and aide in meeting the energy objectives consistent with the LEED Gold Certification;

6.6.6.1 (3) provide foamed plastic insulation that is CFC and HCFC free and in compliance with the Province of British Columbia Ozone Depleting Substances Regulations;

6.6.6.1 (4) comply with minimum insulation values of R20 (U-Value 0.05) for exterior walls and R30 (U-Value 0.0033) for roof areas; and

6.6.6.1 (5) ensure that girts and spacers, when used in an exterior wall assembly, are thermally broken.

6.6.7 Roofing

The Design-Builder will:

6.6.7.1 (1) ensure that all roofing systems and associated flashing systems conform to the requirements of RCABC Roofing Practices Manual;

6.6.7.1 (2) provide a comprehensive labour and materials warrantee in the form of RCABC's 10-year Roofstar Guarantee for all roof systems including independent inspections and reports;

6.6.7.1 (3) use roof materials that comply with RCABC Roofing Practices Manual "Acceptable Materials List," including:

6.6.7.1 (3) (a) flexible membrane – SBS modified (two-ply system) with top cap, minimum 2.2 mm base and 3.0 mm cap sheets with a Fire Hazard Classification conforming to CAN/ULC S107 for Class A classification; and

6.6.7.1 (3) (b) metal roofing will be standing seam with Kynar 500 coating finish.

6.6.7.1 (4) ensure that quality of roofing will undergo inspections as required by the RCABC;

6.6.7.1 (5) use foamed plastic insulation that is CFC- and HCFC-free and in compliance with the Province of British Columbia Ozone Depleting Substances Regulations;

6.6.7.1 (6) provide a complete horizontal barrier to weather and climate, using one of the following construction systems as applicable to the installation required:

6.6.7.1 (6) (a) other roofing systems including sheet metal and roof tiles;

6.6.7.1 (7) provide roofing systems that include:

6.6.7.1 (7) (a) prefinished flashings and sheet metal;

6.6.7.1 (7) (b) thermal insulation;

6.6.7.1 (7) (c) roofing specialties and accessories required for completion;

6.6.7.1 (7) (d) roof drainage, including overflow scuppers;

6.6.7.1 (7) (e) snow retention system as required; and

6.6.7.1 (7) (f) structural anchor system to meet all requirements including WorkSafe BC.

6.6.7.1 (8) design sheet metal flashings to divert water away from membrane flashing termination and protect the membrane from deterioration due to the elements and mechanical damage. The roofing membrane will be continuous under the metal;

6.6.7.1 (9) provide curbs for roof-mounted mechanical and electrical equipment with flashings and continuous roofing membrane to ensure continuity of the roofing weather barrier;

6.6.7.1 (10) provide curbs, flashings or custom fittings to ensure continuity of the roofing weather barrier at roof penetrations;

6.6.7.1 (11) ensure that metal roofing systems, if used, will provide clear internal paths of drainage to allow any trapped moisture to drain to the exterior and avoid the staining of architectural finishes, forming of puddles, forming of icicles, and dripping on pedestrians;

6.6.7.1 (12) ensure that Facility Design and roof systems provide for protection of entrance ways from sliding snow and ice with no accumulations of snow and ice in roof valleys;

6.6.7.1 (13) provide clearly designated maintenance paths to roof-mounted equipment, with built-up durable material suitable for the intended level of foot traffic and rolling loads where removal of equipment is anticipated;

6.6.7.1 (14) provide stair and man-door access to roof areas for maintenance access (size as per typical exterior door);

6.6.7.1 (15) not provide ladders and hatches for roof access;

6.6.7.1 (16) provide galvanized steel steps between roofs where roof elevations vary;

6.6.7.1 (17) provide a complete coordinated system safety tie-back line anchors, horizontal lifeline system and associated equipment for safe Facility maintenance operations including window-washing, and conforms with the following requirements:

6.6.7.1 (17) (a) provide easy access to window cleaning; and

6.6.7.1 (17) (b) provide window washing roof anchors and rigging system;

6.6.7.1 (18) ensure that roof and roof deck areas will:

6.6.7.1 (18) (a) use pavers for areas accessible to students and staff; and

6.6.7.1 (18) (b) where visible from the Formal Learning spaces, PDC, Primary and Secondary corridors provide aesthetically pleasing design concept;

6.6.7.1 (19) ensure that for roofing drains, gutters and downspouts:

6.6.7.1 (19) (a) water from all the roof areas will be directed away from the parapets by roof drains, gutters and downspouts connected to the on-site drainage system; and

6.6.7.1 (19) (b) snow shedding and removal of snow from roof will not cause injury and property damage from sliding ice and snow. Structural support will be provided for roof projection such as vents, chimneys and canopies to resist shear forces resulting from sliding snow; and

6.6.7.1 (20) at SBS membrane roofing installations, provide a perimeter fall warning demarcation zone in contrasting capsheet color; zone to be 2 metres wide at entire perimeter.

6.6.8 Fire and Smoke Protection

The Design-Builder will:

6.6.8.1 (1) refer to and conform to the VBBL requirements;

6.6.8.1 (2) spray-applied cementitious fire proofing that conforms to standards of ULC, WH Certification Listings;

6.6.8.1 (3) integrate barriers into vertical and horizontal space separations to protect against the spread of fire and smoke, and apply protection to exposed Facility elements (structural and non-structural) susceptible to fire and subsequent damage;

6.6.8.1 (4) protect penetrations of vertical and horizontal fire-resistance rated separations;

6.6.8.1 (5) ensure that fire-stopping and smoke seal systems consist of asbestos-free materials and systems, capable of maintaining an effective barrier against flame, smoke, and gases;

6.6.8.1 (6) ensure fire-stopping materials will:

6.6.8.1 (6) (a) be compatible with substrates;

6.6.8.1 (6) (b) allow for movement caused by thermal cycles; and

6.6.8.1 (6) (c) prevent the transmission of vibrations from pipe, conduit or duct to structure and structure to pipe, conduit or duct.

6.6.8.1 (7) ensure that when more than one product is required for an assembly, all products are compatible and are from the same manufacturer;

6.6.8.1 (8) ensure that fire stopping sealants and coatings will be silicone-based and guaranteed not to re-emulsify if subject to wetting or standing water; and

6.6.8.1 (9) not use acrylic-based coatings and sealants.

6.6.9 Sealants

The Design-Builder will:

6.6.9.1 (1) apply sealant materials to the building envelope systems or around openings in the building envelope systems as required to prevent water ingress;

6.6.9.1 (2) ensure sealed joints between dissimilar or similar materials to allow a smooth or even transitions;

6.6.9.1 (3) ensure sealed expansion or control joints in the building envelope systems or structural systems to allow movement.

6.6.9.1 (4) ensure that exterior sealants will completely and continuously fill joints between dissimilar and/or similar materials;

6.6.9.1 (5) ensure that the interior sealant (at frames such as those at doors, and windows) will completely fill joints between dissimilar materials and will be one component, acrylic emulsion type;

6.6.9.1 (6) provide silicone caulking to washroom plumbing fixtures that are mildew-resistant and impervious to water;

6.6.9.1 (7) ensure sealants applied to expansion and control joints in concrete floors requiring self-levelling properties will be two-component epoxy urethane sealants for horizontal surfaces;

6.6.9.1 (8) ensure sealants for exterior vertical expansion and control joints in masonry or wall cladding will be non-sag sealant; and

6.6.9.1 (9) ensure sealants allow for minimum 25% movement in joint width.

6.6.10 Wall Panels

The Design-Builder will:

6.6.10.1 (1) provide adequate gauge metal to prevent oil-canning and resistance to damage from abuse. Finish will be durable and cleanable;

6.6.10.1 (2) provide specialized durable wall panels up to 1000 mm above finished surface to withstand impact from snow clearing equipment and bicycles; and

6.6.10.1 (3) ensure finish of exposed edges and seams in metal wall panels will be smooth.

6.7 Openings (Division 8)

6.7.1 The Design-Builder will:

6.7.1.1 (1) use laminated glass for exterior and interior glazing at windows, doors and sidelights except where rated glass is required in accordance with the VBBL;

6.7.1.1 (2) not use wired glass;

6.7.1.1 (3) use installation methods and locations for doors, frames, and hardware that conform to DHI standards;

6.7.1.1 (4) design glazed exterior components in accordance with the City of Vancouver Bird Friendly Design Guidelines; and

6.7.1.1 (5) provide overhangs and weather protection for all exterior doors.

6.7.2 Doors

The Design-Builder will:

6.7.2.1 (1) size, fabricate, and install doors to suit the intended function of spaces or rooms requiring acoustic or visual privacy, security, special HVAC requirements, fire-resistance rated separations or other closures;

6.7.2.1 (2) ensure that all doors along major circulation routes, stair egress, exit doors and doors providing access to the service areas are painted hollow metal doors in painted pressed steel frames.

6.7.2.1 (3) comply with the following size requirements for doors:

6.7.2.1 (3) (a) door openings will be of adequate width to suit the intended purpose of rooms on either side of the doors and allow the movement of people and equipment associated with those rooms. All openings will be minimum 915mm;

6.7.2.1 (3) (b) no single door will be less than 915mm wide;

6.7.2.1 (3) (c) double doors will be provided into rooms where large pieces of equipment will be moved in or out during the lifetime of the School and where such equipment cannot pass through 1200 mm single door openings;

6.7.2.1 (3) (d) provide double doors as required in the School Room Data Sheets; and

6.7.2.1 (3) (e) no door or door leaf will be less than 2135 mm high, unless specifically required for access to services or other purposes where height is restricted.

6.7.2.1 (4) comply with the acoustic requirements for doors set out in Appendix 1C – Acoustic and Noise Control Ratings;

6.7.2.1 (5) apply door sizes and designs consistently to rooms of similar use, location, and configuration;

6.7.2.1 (6) ensure that doors do not swing into corridors in a manner that may obstruct traffic flow or reduce the corridor width, except doors to spaces that are used infrequently and not subject to occupancy such as small closets;

6.7.2.1 (7) ensure doors have appropriate hinges, edge protection, and face protection to minimize damage and resultant disruptive maintenance;

6.7.2.1 (8) ensure doors and frames have a suitable finish that prevents dirt and fingerprint accumulation, and can be easily cleaned and disinfected;

6.7.2.1 (9) ensure that the extent of glazing in a door, or the size and quantity of sidelights are consistent. All glazing in doors metal or wood will be in a metal frame. Refer to the School Room Data Sheets;

6.7.2.1 (10) provide doors and door frames will have the capability to withstand the varying and high levels of humidity and impact that occur typically within an environment such as the Facility, and maintain their inherent aesthetic and functional capacities; and

6.7.2.1 (11) design frames and anchors for doors, sidelights, and interior and exterior windows for special areas such as shops and laboratories to withstand the heavy degree of impact anticipated and maintain their aesthetic and functional capacities.

6.7.3 Door Types

Door types include the following:

6.7.3.1 (1) Type A – Solid door;

6.7.3.1 (2) Type B – Slot glazing;

6.7.3.1 (3) Type C – Half glazing;

6.7.3.1 (4) Type D – Fully glazed;

6.7.3.1 (5) Type E – Overhead exterior doors;

6.7.3.1 (6) Type F – Overhead interior door;

6.7.3.1 (7) Type G – Interior security grille;

6.7.3.1 (8) Type H – Interior security shutters (rolling);

6.7.3.1 (9) Type I – Heavy duty operable motorized and acoustically rated;

6.7.3.1 (10) Type J – Operable walls; and

6.7.3.1 (11) Type K – Overhead rolling shutters (exterior).

6.7.4 Hollow Metal Doors and Frames

The Design-Builder will:

6.7.4.1 (1) for all door frames other than aluminum, provide welding pressed steel frames.

6.7.4.1 (2) ensure materials and manufacture of metal doors and frames will conform to the requirements of the CSDFMA.

6.7.4.1 (3) ensure interior metal doors will have flush faced construction.

6.7.4.1 (4) provide Hollow Metal Doors at all interior locations except classrooms or as required in the School Room Data Sheets.

6.7.4.1 (5) provide pressed metal frames that have:

6.7.4.1 (5) (a) fully welded construction;

6.7.4.1 (5) (b) thermally-broken door frames at exterior locations; and

6.7.4.1 (5) (c) provide anchors to each jamb to suit wall type and receive the frame; and

6.7.4.1 (6) ensure that door glazing conforms to the following:

6.7.4.1 (6) (a) exterior glazing will be sealed units in thermally-broken frames to prevent heat loss; and

6.7.4.1 (6) (b) for interior door glazing locations and requirements refer to the School Room Data Sheets.

6.7.5 Exterior Insulated Metal Doors

The Design-Builder will provide exterior insulated metal doors that conform with the following:

6.7.5.1 (1) flush faced construction;

6.7.5.1 (2) edge seams to correspond with door function and minimize maintenance needed; and

6.7.5.1 (3) prepared surfaces to receive finishes that resist corrosion from exposure to weather.

6.7.6 Wood Doors

The Design-Builder will provide wood doors that confirm with the following:

6.7.6.1 (1) conform to the Quality Standards for Architectural Woodwork (latest edition) published by the AWMAC;

6.7.6.1 (2) sized, constructed and be provided with hardware and finishes to suit the intended function;

6.7.6.1 (3) flush custom grade quality 45mm thick, solid particleboard core;

6.7.6.1 (4) have perimeter frame on all sides will be solid wood and 140mm wide;

6.7.6.1 (5) finish hardware installed securely to resist loosening over time and fastened to solid wood backing, except where hardware is designed will be through-bolted (closers);

6.7.6.1 (6) stiles, rails and faces glued to the core with Type II water-resistant adhesive to minimize de-lamination or disassembly as a result of moisture ingress; and

6.7.6.1 (7) face veneer of B-Grade hardwood (Birch) veneer with AWMAC No. 3 edge and finished to suit the intended use.

6.7.7 Aluminum Entrances

The Design-Builder:

6.7.7.1 (1) may use aluminum entrances and doors as part of the exterior envelope of the Facility.

6.7.7.1 (2) will use aluminum doors within aluminum entrances;

6.7.7.1 (3) provide frames that are thermally-broken, flush glazed, aluminum sections, to accept insulating glass units where they form part of the building envelope;

6.7.7.1 (4) provide frames that incorporate drained and vented system (rain screen) with a complete air and vapour seal, allowing any moisture entering the frame to drain to the exterior and allowing air into the pressuring chamber;

6.7.7.1 (5) provide aluminum swing entrance doors that are heavy-duty commercial grade and prepped for automatic operation as required;

6.7.7.1 (6) provide inverted roof assemblies complete with RoofStar Guarantee approved leak detection system; and

6.7.7.1 (7) ensure that aluminum finish for exposed aluminum surfaces is applied in the manufacturing process and be permanent and resistant to corrosion caused by weather exposure and climate.

6.7.8 Specialty Doors

6.7.8.1 (1) For overhead exterior doors, the Design-Builder will conform with the following:

6.7.8.1 (1) (a) provide insulated steel sectional upward acting type;

6.7.8.1 (1) (b) provide 600mm x 200 mm vision panels double glazed with 6mm polished laminated glass in one horizontal section;

6.7.8.1 (1) (c) not use wired glass;

6.7.8.1 (1) (d) provide full perimeter weather stripping on exterior overhead exterior door;

6.7.8.1 (1) (e) design panels to withstand wind load of 0.83 kN/m^2 with a minimum horizontal deflection of 1/240 of opening width. Door sections will be roll-formed. 76mm continuous steel coil, hot-dipped galvanized (g-90), pre-painted with baked on premier. Back panel will be 0.45mm steel with baked on white primer. Insulate panels with AF530 Fiberglass or equivalent insulation 50mm thick, RSI 1.4;

6.7.8.1 (1) (f) box (hat) shaped muntins and end stiles will be formed of 0.91 mm hot dipped galvanized steel;

6.7.8.1 (1) (g) bottom sections will have a tubular neoprene astragal held by a continuous PVC retainer fitted to bottom section;

6.7.8.1 (1) (h) electrically operated with remote operation and chain driven manual override. Track will be 76 mm heavy duty trolley type lift with high-cycle springs rated at a minimum 1000,000 cycles. Door will be locked with a cylinder lock compatible with other door hardware; and

6.7.8.1 (1) (i) manufactured by Richard Wilcox Canada or acceptable equivalent;

6.7.8.1 (2) For overhead interior doors, the Design-Builder will conform with the following:

6.7.8.1 (2) (a) overhead doors will be fabricated with metal components and assembled to allow visual access to adjacent space. Aluminum sections will be clear anodised construction;

6.7.8.1 (2) (b) door guides will be complete with aluminum or steel guides, fabricated to withstand vertical and lateral loads, counterbalanced by helical torsion springs, and sound-deadened;

6.7.8.1 (2) (c) manual operation will be provided with inside lift handle and locking bar or chain hoist. Motor operation will be provided on grilles requiring constant usage. Chain operation will be by means of reduction gears and galvanized hand chain;

6.7.8.1 (2) (d) fully glazed (4) panel door, glazing 6mm tempered glass; and

6.7.8.1 (2) (e) doors will be equipped with heavy duty hardware with exterior edges sealed to control air leakage. Doors will be “JP Overhead Door – Model 3290 Aluminum Full View Doors” or acceptable equivalent;

6.7.8.1 (3) For overhead rolling grilles, the Design-Builder will conform to the following:

6.7.8.1 (3) (a) overhead will be fabricated with metal components, and assembled to allow visual access to secure areas;

6.7.8.1 (3) (b) grille guides will be complete with aluminum or steel guides, fabricated to withstand vertical and lateral loads, counterbalanced by helical torsion springs, and sound-deadened; and

6.7.8.1 (3) (c) manual operation will be provided with inside lift handle and locking bar or chain hoist. Motor operation will be provided on grilles requiring constant usage. Chain operation will be by means of reduction gears and galvanized hand chain.

6.7.8.1 (4) For overhead rolling shutters (exterior), the Design-Builder will conform to the following:

6.7.8.1 (4) (a) shutter curtains will be fabricated with extruded aluminum, interlocking flat slats, complete with guides of similar materials;

6.7.8.1 (4) (b) shutters will have momentary switches motor operation with locking capability.

6.7.8.1 (4) (c) manufactured by Talius roll shutters or acceptable equivalent;

6.7.8.1 (4) (d) the shutter will fully cover the windows with weather seal;

6.7.8.1 (4) (e) provide overhead rolling shutters at the grade level exterior windows on the east and south facades of the Facility.

6.7.8.1 (5) For interior security shutters (rolling), the Design-Builder will conform to the following:

6.7.8.1 (5) (a) provide rolling counter shutter as manufactured by Kinnear Industries Corp or acceptable equivalent;

6.7.8.1 (5) (b) allow operation by hand;

6.7.8.1 (5) (c) provide continuous extruded aluminum lifting strop on inside face of shutter bottom;

6.7.8.1 (5) (d) includes curtains of extruded aluminum interlocked slats sections.

6.7.8.1 (5) (e) finish will be clear anodized finish, length and height as per final design;

6.7.8.1 (5) (f) provide continuous vinyl bumper to bottom bar;

6.7.8.1 (5) (g) guides of extruded aluminum, 5mm thick, finished as curtain;

6.7.8.1 (5) (h) hood will have enclosure counterbalance assembly with aluminum braked formed sheet hood finished as curtain;

6.7.8.1 (5) (i) provide an enclosed torsion spring balance assembly with 25% overload factor, encased in settle tube to support curtain with a maximum deflection of 1/360th of opening width;

6.7.8.1 (5) (j) provide adjusting wheel, accessible for setting;

6.7.8.1 (5) (k) equip shutters with lockable slide bolts on the inside; and

6.7.8.1 (5) (l) the interior security shutter will provide the required fie rating.

6.7.8.1 (6) For automatic swing doors, the Design-Builder will conform with the following:

6.7.8.1 (6) (a) use automatic swing doors for interior and exterior locations as designated. All exterior accessible doors will be automatic swing doors;

6.7.8.1 (6) (b) ensure the door equipment accommodates medium to heavy pedestrian traffic and up to 98 kg weight of doors;

6.7.8.1 (6) (c) use one of the following approved door equipment manufacturers: Stanley Magic Access, Besam Auto Swing and Dor-O-Matic Magic Door man;

6.7.8.1 (6) (d) ensure that directional motion sensor control device, if used, are unaffected by ambient light or electronic frequencies; and

6.7.8.1 (6) (e) ensure that all in-swing doors that are required exits are equipped with an emergency breakaway switch that internally cuts power to the operator. No external power switch will be allowed;

6.7.8.1 (7) for gymnasium dividers (Gymnasium Large), the Design-Builder will conform with the following:

6.7.8.1 (7) (a) all welded steel panels, 75mm thick, with an STC of 49, vinyl finish, high impact resistant. Height up to under side of structure c/w pass door on each end and stacked in a pocket with pocked doors;

6.7.8.1 (7) (b) electrical motor drive operation with one key operation Moderco Gym Door 8010 or an acceptable equivalent;

6.7.8.1 (7) (c) door to cover the entire width of the gymnasium;

6.7.8.1 (7) (d) access to the motor will be simple;

6.7.8.1 (7) (e) provide large access doors; and

6.7.8.1 (7) (f) not require the use of special equipment.

6.7.8.1 (8) for operable partitions, the Design-Builder will conform with the following:

6.7.8.1 (8) (a) gypsum board with pressure laminated steel on aluminum/welded steel frame, with an STC of 47, vinyl finish, c/w accessory track and trolley for a remote storage system;

6.7.8.1 (8) (b) panels will be equipped with a fixed top seal and mechanical bottom seal; and

6.7.8.1 (8) (c) manufactured by Richards-Wilcox, Brunswick or an equivalent as approved by the Owner; and

6.7.8.1 (8) (d) provide access to properly and safely service and repair the drive unit, provide switches to stop the motor in either direction, provide mechanism to manually operate the wall, provide proper seals or shoes at bottom of the panels to stop the side to side movement when the wall is fully extended across the floor and design for stability of the wall when extended;

6.7.8.1 (9) for the gymnasium curtain, the Design-Builder will conform with the following:

6.7.8.1 (9) (a) for Gymnasium Small, provide electronically operated ceiling mounted roll up gym divider curtain;

6.7.8.1 (9) (b) lower section of curtain will be solid vinyl coated polyester (18 ox. Per square metre/yard) and upper section will be average nice (9) one per square metre/yard vinyl coated polyester mesh;

6.7.8.1 (9) (c) colour will be reviewed by Owner; and

6.7.8.1 (9) (d) manufactured by Draper or acceptable equivalent.

6.7.8.1 (10) for interior security grille (sliding), the Design-Builder will conform with the following:

6.7.8.1 (10) (a) pivot sections: provide continuous vertical interlocking aluminum members with full height butt hinges, with continuous recess in edges to accept panels, top and bottom closure panels and end member connectors;

6.7.8.1 (10) (b) perforated steel panels: steel panels, full height between top and bottom closure panels. Panels perforated with round holes in a staggered pattern;

6.7.8.1 (10) (c) top and bottom closure panels: extruded aluminum panels shaped to fit into pivot sections and to accept trolley hanger assemblies;

6.7.8.1 (10) (d) leading end member: extruded aluminum tube with recess for attaching curtain sections;

6.7.8.1 (10) (e) intermediate members extruded aluminum tube with recess for attaching curtain sections;

6.7.8.1 (10) (f) trailing end member: extruded aluminum tube with recess for attaching curtain sections;

6.7.8.1 (10) (g) trolleys: nylon tired ball bearing wheels; two wheel assembly at each hanger; three wheel assembly at all vertical members;

6.7.8.1 (10) (h) track: extruded aluminum section with continuous recess for splice tongues and pins;

6.7.8.1 (10) (i) provide heavy duty top and bottom latching system complete with keyed cylinder lock. Lock operable from secure side;

6.7.8.1 (10) (j) complete security grille with necessary hardware and accessories including but not limited to dust proof floor and head sockets, rubber edge bumpers, and multiple keys; and

6.7.8.1 (10) (k) interior security grille when folded will be stored in a pocket with door closure.

6.7.9 Finish Hardware

The Design-Builder will:

6.7.9.1 (1) provide all necessary Facility hardware, including door hardware, millwork hardware, and security hardware;

6.7.9.1 (2) prepare a representative hardware schedule to identify quality standard for each type of hardware on the Facility, including a list of each item's manufacturer, size code, number and finish;

6.7.9.1 (3) prepare and submit complete hardware schedule for all items, fully itemized after contract award for the Owner's approval;

6.7.9.1 (4) provide and submit a master keyed system and a grand master keyed system to the Owner for approval;

6.7.9.1 (5) use one manufacturer's product for all similar items;

6.7.9.1 (6) provide all exterior hardware through-bolted;

6.7.9.1 (7) provide galvanized steel bollards as door stops on all exterior doors complete with neoprene stopper security fastened to bollard at point of contact;

6.7.9.1 (8) provide all exterior doors fully weather stripped;

6.7.9.1 (9) provide all exterior weather stripping that is fully rodent proof;

6.7.9.1 (10) Sound Seals

6.7.9.1 (10) (a) All doors through walls where significant sound isolation is required shall be provided with perimeter seals as follows:
.1 Pemko 281-CM magnetic seal for metal doors; and
.2 Pemko 319-CN for wood doors or acceptable equivalent; and

6.7.9.1 (11) Automatic door bottoms shall be: Pemko 430-CR or acceptable equivalent.

6.7.10 Windows (Interior and Exterior)

The Design-Builder will:

6.7.10.1 (1) ensure that windows are sized, configured, and adequately constructed to suit rooms that require daylight and or views;

6.7.10.1 (2) design the size, configuration and orientation of windows to provide ample daylight for the rooms they occur in, while controlling solar heat gain and glare;

6.7.10.1 (3) provide windows from a recognized manufacturer with local service representation;

6.7.10.1 (4) provide borrowed light where possible through interior windows to occupied rooms that do not have exterior windows;

6.7.10.1 (5) coordinate interior glazing head and sill heights with adjacent wall protection, handrails, and other accessories to achieve functional and aesthetic cohesiveness;

6.7.10.1 (6) ensure glazing will be easily replaceable; and

6.7.10.1 (7) provide glazing systems and components that can be easily accessed for maintenance and repair including locations facing into atrium spaces.

6.7.11 Aluminum Windows

The Design-Builder will:

6.7.11.1 (1) provide aluminum windows that conform to the AAS, and the AAMA field testing specifications;

6.7.11.1 (2) ensure windows incorporate a drained and vented system with a complete air and vapour seal, allowing any water entering the framing/system and the glazing detail cavities to drain to the exterior and also allow air into the pressuring chamber;

6.7.11.1 (3) ensure window performance ratings will meet the requirements of CAN3-A440-M90 for the Facility height, location and exposure. The minimum allowable rating for windows will be A3, B3, C3, 150;

6.7.11.1 (4) provide high quality, commercial grade and durable windows. Light weight, residential quality windows will not be used;

6.7.11.1 (5) ensure that vertical window mullion locations will respect the Facility planning grid;

6.7.11.1 (6) provide for cleaning windows above the height reached by window cleaners with extension tube brushes;

6.7.11.1 (7) ensure safety features such as roof-top anchors are provided where necessary;

6.7.11.1 (8) for operable windows,

6.7.11.1 (8) (a) provide “limiters” to open 100mm at all operable windows;

6.7.11.1 (8) (b) ensure such windows have top hung inward opening lights, the size of opening will be the width between vertical mullions and the height a minimum of 400mm; and

6.7.11.1 (8) (c) ensure such windows are fully weather-stripped, using heavy duty EPDM or neoprene material;

6.7.11.1 (8) (d) not use vinyl or vinyl composite weather-stripping will not be used; and

6.7.11.1 (8) (e) provide each room with opener poles as an accessory to the windows;

6.7.11.1 (9) design the curtain wall window framing to incorporate a thermal-break system;

6.7.11.1 (10) ensure aluminum finish for exposed aluminum surfaces is permanent and resistant to corrosion resulting from weather exposure and climate;

6.7.11.1 (11) design the assembly to resist local seismic conditions;

6.7.11.1 (12) ensure the assembly will resist 1-in-100-year climatic events (with a safety factor);

6.7.11.1 (13) ensure the aluminum window system will be in accordance with VBBL requirements;

6.7.11.1 (14) completely seal with weather barrier window flashing the perimeter of the window rough opening;

6.7.11.1 (15) provide flashings of a suitable corrosion resistant material and where exposed, of pre-finished metal;

6.7.11.1 (16) ensure exterior window sills are flashed and sloped away from the window and have a projecting drip. The backs and ends of sills will be turned up to form a three-sided pan. Ends, laps and intersections of sill flashings will be made watertight;

6.7.11.1 (17) provide flashing at window heads;

6.7.11.1 (18) ensure window glazing stops will be on the inside of the frame for ease of maintenance and repair; and

6.7.11.1 (19) provide a written guarantee from the manufacturer that any defects in design, materials, or workmanship will be made good by the manufacturer at no additional cost to the Owner for a period of five (5) years from Substantial Completion;

6.7.12 Aluminum Curtain Walls

The Design-Builder will:

6.7.12.1 (1) provide aluminum curtain walls that conform to the AAS, and the AAMA field testing specifications;

6.7.12.1 (2) ensure that curtain wall framing incorporates a drained and vented system with a complete air and vapour seal, allowing any water entering the framing/system and the glazing detail cavities to drain to the exterior and also allow air into the pressuring chamber;

6.7.12.1 (3) design the curtain wall framing to incorporate a thermal-break system;

6.7.12.1 (4) ensure that aluminum finish for exposed aluminum surfaces will be permanent and resistant to corrosion resulting from weather exposure and climate;

6.7.12.1 (5) use Kawneer 1600 or an acceptable equivalent;

6.7.12.1 (6) design the assembly to resist local seismic loads; and

6.7.12.1 (7) ensure the assembly will resist 1-in-100-year climatic events (with a safety factor).

6.7.13 Skylights

6.7.13.1 (1) The Design-Builder will not use skylights.

6.7.14 Glass and Glazing

The Design-Builder:

6.7.14.1 (1) will provide glass and glazing materials and workmanship that conforms to the IGMAC Guidelines, and the GCA Glazing Systems Specifications Manual;

6.7.14.1 (2) may provide exterior and/or interior glass and glazing as integral components of the exterior building envelope, interior partitions and screens, exterior and interior doors, handrail balustrades and decorative and ornamental glazing;

6.7.14.1 (3) will design the assembly to resist local seismic conditions;

6.7.14.1 (4) will ensure the assembly will resist 1-in-100-year climatic events (with a safety factor);

6.7.14.1 (5) will provide laminated safety glass to all exterior doors, sidelights, transoms, to glazing above all exits, and glazed openings within 900 mm above the finished floor;

6.7.14.1 (6) will not use tempered glass or wired glass;

6.7.14.1 (7) will provide laminated safety glass for all interior glazing;

6.7.14.1 (8) will provide high performance (Low E Glass) at exterior locations;

6.7.14.1 (9) will ensure double glazed air space is Argon filled;

6.7.14.1 (10) where glazing tape is employed, ensure it is pre-formed, pre-shimmed butyl such as TREMCO Polyshim II, corners sealed with acrylic-based sealant. Non-shimmed tape will not be used;

6.7.14.1 (11) where glazing gaskets are used, will ensure they are neoprene of EPDM, Vinyl or vinyl composites will not be used;

6.7.14.1 (12) will guarantee sealed, glazing units for a minimum of 5 years.

6.7.14.1 (13) will provide mirrors that conform with the following:

6.7.14.1 (13) (a) wall unframed mirrors will be 6 mm thick minimum float glass backed with electrolytically-applied copper plating. All edges will be ground smooth and polished.

6.7.15 Door Hardware

The Design-Builder will:

6.7.15.1 (1) provide finish hardware materials and workmanship that conform to quality standards of the DHI.

6.7.15.1 (2) ensure that standard hardware location dimensions are in accordance with Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame manufacturers' Association;

6.7.15.1 (3) ensure that the finish hardware supplier will be an established hardware firm who has in its employ one or more AHC who are members in good standing of the DHI and who will be responsible for the complete hardware contract;

6.7.15.1 (4) select finishes to provide maximum longevity and preservation of the finish;

6.7.15.1 (5) provide a written guarantee from the manufacturer that any defects in design, materials, or workmanship of the door closers will be made good by the manufacturer at no additional cost to the owner for a period of 5 years from date of final completion of the Facility;

6.7.15.1 (6) provide ULC-listed hardware on door that are required to have fire rating.

6.7.15.1 (7) provide hardware that is heavy-duty, commercial grade, durable product. Locksets and latch sets will be fully mortised type and lever handles will be solid material;

6.7.15.1 (8) submit hardware schedule to the Owner for review prior to ordering of hardware;

6.7.15.1 (9) provide finish hardware as follows:

6.7.15.1 (9) (a) Exit Devices
- .1 Von Duprin 98 Series;
- .2 Install with through bolts;
- .3 Closers that are LCN 4041 Series Closer; and
- .4 Note combined door closers/ hold open/door stop devices are not acceptable.

6.7.15.1 (9) (b) Keys
- .1 Keyways for doors will be Corbin 62B2, restricted to Owner, keyed 444444; and
- .2 Provide two (2) blank keys for each cylinder stamped “DO NOT DUPLICATE”.

6.7.15.1 (9) (c) PS All cylinders will be CONVENTIONAL as described in the Corbin Russwin Architectural Hardware Catalog – Key Systems Pages 8 – 13 (interchangeable cores are not suitable);

6.7.15.1 (9) (d) All mortise type locks will be heavy duty type with a 2 ¾” back set and will have anti-friction latch bolts, Corbin ML2000 Series will be accepted. Finish will be 626 Satin Chrome;

6.7.15.1 (9) (e) Classrooms:
- .1 Classroom Lock: Corbin ML2055. Latch bolt operated by lever from either side unless outside is locked by key. Unlocked from outside by key. Inside lever always free for immediate exit. The auxiliary latch deadbolts the latch bolt when the door is closed;

6.7.15.1 (9) (f) Other rooms requiring lockability:
- .1 Deadlock: Corbin Mortise Deadbolt DL 4013 Bolt operated by key outside or thumb knob inside;
- .2 Utility Lock: Corbin ML2055 Latch bolt retracted by lever from either side. Deadbolt operated by key from the outside and thumb knob from the inside;
- .3 Office Lock: Corbin ML2055 Latch bolt retracted by lever from either side unless outside lever is locked by toggle action stop. Auxiliary latch deadbolts latch bolt. Inside lever always free; and
- .4 Store Room: Corbin ML2055 Latchbolt retracted by key outside or knob/lever inside. Outside lever always inoperative. Auxiliary latch deadbolts latch bolt when door is closed;

6.7.15.1 (9) (g) Staff washrooms: Corbin mortise locks ML 2055 to include Schlage Indicator bolt;

6.7.15.1 (9) (h) Hardware Trim
- .1 Levers will be wrought Corbin LWA; and
- .2 Rosettes will be wrought Corbin LWA;

6.7.15.1 (9) (i) Finishes
- .1 626 Satin Chrome to match other door hardware. Note: It is important that all hardware be through bolted to ensure durability;

6.7.15.1 (9) (j) Storage Rooms
- .1 The door handle on the gymnasium side of a door lock will be a flush cup manufactured by Trimco #1067-516x630; and
- .2 Wherever a deadlock, dead latch or night latch is specified, dummy door levers will be supplied unless equipped with a door pull handle. All door locks will be supplied matching strikes and strike boxes;

6.7.15.1 (9) (k) Push Plates: Hager HA9501.89mm x 381mm x 1.6mm 626 Satin Chrome. Install with through bolts;

6.7.15.1 (9) (l) Keys
- .1 Keyways for doors will be Corbin 62B2, restricted to Owner, keyed to 444444;
- .2 Provide two (2) blank keys stamped “DO NOT DUPLICATE” for each lock;
- .3 Tag and identify keys by room number with lock that key operates;
- .4 Tags will be 30mm diameter white cardboard with metal edges, secured to keys by loop of fine wire; and
- .5 Provide a list of key numbers with corresponding room numbers and door numbers to the Owner upon completion of the Facility. All cylinders are to come with a construction key, so the final keying is done once the construction pin is pulled;

6.7.15.1 (9) (m) Key Cabinet: Enamel finish steel lockable cabinet complete with key tags and index cards and size to accommodate all keys, plus 10% extra;

6.7.15.1 (9) (n) Templates: Supply templates to trades requiring same for fabrication of steel doors and frames;

6.7.15.1 (9) (o) Kickplates:
- .1 Hager HA9550, Stainless Steel, 1.3mm thick by 254mm high. The width of the push side will be 50mm less that the door width on single doors and 25mm less on pairs of doors; and
- .2 Shipping & Receiving area door(s) will have kickplates both sides 1.3mm thick by 900mm high. The width of the push side will be 50mm less that the door width on single doors and 25mm less on pairs of doors. On the pull side they will be 12.5mm less that the door width;

6.7.15.1 (9) (p) Cylinders: Corbin 62B2. Supply and install cylinders for service access doors.

6.7.15.1 (9) (q) Lever Extension Flush Bolts: Hager HA1250 x 305mm c/w mortised keeper. Install in pairs, one at top and one at bottom of each leaf of double door;

6.7.15.1 (9) (r) Door Holder (floor type): Ives #452B10. Hinged brass, 102mm;

6.7.15.1 (9) (s) Door Stops:
- .1 Wall mounted: will be brush chrome (626), will be installed on firm backing, Trimco 1270 or equal;
- .2 Floor mounted: Will be brush chrome (626). Trimco 1211 or equal, to suit undercut door;

6.7.15.1 (9) (t) Staff Washroom: Corbin Deadbolt c/w occupancy indicator;

6.7.15.1 (9) (u) Automatic Operators Stanley Magic Force (Provide automatic operators complete with on/off Key switch with Corbin);

6.7.15.1 (9) (v) Cylinder keyable to School master.
- .1 All electronic devices will be keyed to School master and all electronic switches will come with conventional cylinders and able will be keyed to School master);

6.7.15.1 (9) (w) Cabinet Locks Door locks for 25mm doors: CCL or equal #02066-C26D, 29mm Door locks and drawer locks: CCL or equal #02066-C26D, 22mm;

6.7.15.1 (10) submit hardware keying schedule to Owner for review;

6.7.15.1 (11) work with the Owner to confirm required keying;

6.7.15.1 (12) Not use the following:

6.7.15.1 (12) (a) continuous hinges on all exterior and interior doors;

6.7.15.1 (12) (b) concealed vertical exit devices;

6.7.15.1 (12) (c) combined door closers/holdback devices - each device will be installed separately;

6.7.15.1 (12) (d) dorma closers; and

6.7.15.1 (12) (e) cylindrical locks.

6.8 Finishes (Division 9)

6.8.1 In areas where finishes and systems of installation will occur, and water is anticipated to be present as part of cleaning or other procedures, water will be allowed to collect and exist without causing damage to the finishes or substrate.

6.8.2 For areas in which wear is a concern, such as areas with anticipated pedestrian or wheeled traffic, the Design-Builder will ensure that finish materials are durable to withstand damage and easily replaceable in sections if damage does occur. The Design-Builder will provide 5% extra product to replace the damaged section.

6.8.3 The Design-Builder will consider the acoustic characteristics of finish materials as a priority. Refer to Appendix 1C - Acoustic and Noise Control Ratings.

6.8.4 The Design-Builder will ensure that the appearance of finishes and colours create and promote a natural and vibrant learning environment, prevent glare, and minimize artificial lighting requirements.

6.8.5 The Design-Builder will select materials that promote sustainability such as materials having low-emissivity or comprising of renewable resources.

6.8.6 The Design-Builder will design the interior spaces to minimize maintenance requirements, including cleaning of horizontal reveal and shadow lines.

6.8.7 Interior Wall Framing

The Design-Builder will:

6.8.7.1 (1) provide materials and workmanship for interior walls, including steel studs and furring and gypsum board ceiling suspension systems, that conform to the CSSBI, and the AWCC Wall & Ceiling Specification Standards Manual (latest edition);

6.8.7.1 (2) ensure system design and components will meet seismic restraint requirements and conform to VBBL requirement;

6.8.7.1 (3) ensure prefabricated steel studs for interior partitions and furring are non-load bearing, with no axial load other than its own weight, the weight of attached finishes, and lateral loads of interior pressure differences and seismic loads;

6.8.7.1 (4) ensure that steel stud framing construction accommodates electrical, plumbing and other services in the partition cavity, and support fixtures, wall cabinets and other such wall-mounted items with reinforcement and backing; and

6.8.7.1 (5) consider in the Design the differences in air pressure that may result on opposite sides of the wall or partition due to factors such as wind and other lateral pressures, stack effects, or mechanically-induced air pressurization.

6.8.8 Gypsum Board

The Design-Builder will:

6.8.8.1 (1) provide materials and workmanship for gypsum board and accessories that conform to the AWCC Wall & Ceiling Specification Standards Manual (latest edition);

6.8.8.1 (2) ensure thickness of gypsum board will be no less than (16 mm). Type X board where required by VBBL;

6.8.8.1 (3) use reinforced cementitious backer board ASTM C1325 or ANSI A118.9 behind ceramic wall tile in showers, behind sinks, or other wet areas;

6.8.8.1 (4) provide abuse-resistant gypsum board ASTM C1278/C1278M or ASTM C1396/C1396M will be provided to common and circulation areas for increased resistance to abrasion, indentation, and penetration of interior walls and ceilings;

6.8.8.1 (5) use glass mat surfaced gypsum sheathing board ASTM C1177/C1177M wherever exterior gypsum sheathing is required at exterior walls.

6.8.8.1 (6) provide and install metal access doors in size and UL fire rated or non-fire rated as required. All door opening will be framed in steel stud framing and lockable when located in student accessible areas. Access doors on ceilings will be sized allowing easy access for maintenance.

6.8.8.1 (7) for washrooms, use 13mm thick plywood backing with impact-resistant gypsum wall board throughout. This applies in areas not finished in ceramic tile;

6.8.8.1 (8) refer to Appendix 1C – Acoustic and Noise Control Ratings for specific requirements for acoustic performance and construction.

6.8.9 Ceramic Tilework

The Design-Builder will:

6.8.9.1 (1) provide materials and workmanship for ceramic tilework that conform to the TTMAC Specification Guide 09300 Tile Installation Manual (latest edition).

6.8.9.1 (2) ensure ceramic tile conforms to CGSB 75-GP-1A specification (or latest edition), manufactured by an approved manufacturer.

6.8.9.1 (3) install ceramic tile in accordance with the standards and specifications adopted by the Ceramic Tile Contractors Association of BC.

6.8.9.1 (4) maximize use of ceramic tile in interior applications at food services, washrooms' locker areas and showers in order to reduce opportunities for the spread of infection;

6.8.9.1 (5) provide tile sized 150mmx150mm;

6.8.9.1 (6) refer to the School Room Data Sheets for specific locations for tile;

6.8.9.1 (7) provide ceramic tiles on walls to door head height;

6.8.9.1 (8) use ceramic tile will be used on interior application only;

6.8.9.1 (9) ensure that floor tile installed on wet surfaces have the following static coefficients of friction as per the ASTM:

6.8.9.1 (9) (a) Level Surfaces: Not less than 0.50 for wet and dry conditions;

6.8.9.1 (9) (b) Stair Treads: Not less than 0.60 for wet and dry conditions;

6.8.9.1 (9) (c) Ramp Surfaces: Not less than 0.60 for wet and dry conditions.

6.8.9.1 (10) provide control joints and expansion joints in conformance with the recommendations of the TTMAC Tile Installation Manual;

6.8.9.1 (11) provide waterproof membrane under ceramic floor tile in showers and other wet areas. Waterproofing membrane will be liquid rubber polymer and fabric reinforcing. Membrane will be installed 600mm up surrounding wall surfaces;

6.8.9.1 (12) provide crack isolation membranes to resist crack transmission from the substrate due to lateral movement and designed for use in thin-set applications of tile over a cracked substrate. Materials used will be elastomeric sheets or trowel-applied materials suitable for subsequent bonding of ceramic tile;

6.8.9.1 (13) set and grout ceramic tile with epoxy setting and grouting materials; and

6.8.9.1 (14) provide minimum 2% of each type and colour of tile required for the Facility for maintenance use;

6.8.9.1 (15) store tile where directed by the Owner;

6.8.9.1 (16) provide maintenance material is of same production run as installed material.

6.8.10 Acoustic Ceilings

The Design-Builder will:

6.8.10.1 (1) supply and install the acoustic ceilings in accordance with AWCC – Specification Standards Manual and Heavy Duty System to ASTM C635-07 (or latest Edition);

6.8.10.1 (2) provide the “Donn DX exposed grid system” manufactured by Donn Products Ltd., “Bailey Structural BEF Safe-T-Lock grid system” or an acceptable equivalent grid system;

6.8.10.1 (3) provide standard acoustic ceiling tiles that are CGC – Radar – 16mm square edge – ACT, or an acceptable equivalent;

6.8.10.1 (4) ensure ceiling tiles in a suspension system provide accessibility to the ceiling spaces where access is required to mechanical, electrical or other service systems;

6.8.10.1 (5) provide the type of acoustic ceiling tile that is suitable for the required use of the space.;

6.8.10.1 (6) ensure system design and components meets the seismic restraint requirements and conform to the requirements of VBBL;

6.8.10.1 (7) provide acoustic ceiling tiles with scratch-resistant surfaces where frequently they need to be removed for plenum access;

6.8.11 Flooring

The Design-Builder will:

6.8.11.1 (1) provide materials and workmanship for flooring that conform to the NFCA Specification Standards Manual. US Federal Specification RR-T-650d;

6.8.11.1 (2) select flooring materials based on considerations of ease of cleaning and maintenance, pedestrian and rolling traffic, acoustics, and aesthetics;

6.8.11.1 (3) provide heavy-duty flooring material at locations where wheeled, or service vehicle traffic is anticipated, and wear and damage may result;

6.8.11.1 (4) ensure flooring in student, public, and staff washrooms is impervious to water and have a slip-resistant finish. Refer to the School Room Data Sheets;

6.8.11.1 (5) provide flooring, the types of which are set out in the School Room Data Sheets. The following flooring products are acceptable:

6.8.11.1 (5) (a) Vinyl Sheet (VS);

6.8.11.1 (5) (b) Vinyl Composite Tile (VCT);

6.8.11.1 (5) (c) Linoleum Sheets (LS);

6.8.11.1 (5) (d) Rubber Sheets/Tile (RU);

6.8.11.1 (5) (e) Hardwood Flooring (WF);

6.8.11.1 (5) (f) Sports Flooring (SF);

6.8.11.1 (5) (g) Carpet (C) Carpet Tile (CT);

6.8.11.1 (5) (h) Sealed Concrete (SC);

6.8.11.1 (5) (i) Polished Concrete (PC);

6.8.11.1 (5) (j) Epoxy Finish Concrete (EFC);

6.8.11.1 (5) (k) Composite Safety Flooring (CSF); and

6.8.11.1 (5) (l) Ceramic Tile (CER, Tile).

6.8.11.1 (6) provide sheet vinyl that conform to the following requirements:

6.8.11.1 (6) (a) conform to CSA 126.3 Type II Grade 1 to minimum gauge 2.16mm (0.085:);

6.8.11.1 (6) (b) welded seams to run parallel to longest wall space;

6.8.11.1 (6) (c) arrange sheets to ensure fewest seams; and

6.8.11.1 (6) (d) the accepted product in wet rooms will be non-slip suitable for the use intended.

6.8.11.1 (7) for server rooms, provide dissipative commercial space flooring or acceptable equivalent;

6.8.11.1 (8) for carpets and carpet tiles, ensure that:

6.8.11.1 (8) (a) carpeting is certified under CCI/CRI Indoor Air Quality Program and has CRI/IAQ Label and number certifying that VOC emission rate of less than 0.6 mg/ m^2 /h^4 has been passed;

6.8.11.1 (8) (b) carpet will maintain static generation at less than 3.5 kV at 21 °C and 20% relative humidity throughout the life of the product;

6.8.11.1 (8) (c) the adhesive for carpet will be non-solvent, non-toxic, and odourless adhesive; and

6.8.11.1 (8) (d) the carpet is designed to accept wheelchair traffic.

6.8.11.1 (9) for other flooring, provide specialized application such as poured epoxy or special vinyl where required. These applications will be reviewed on a per application basis;

6.8.11.1 (10) for wood flooring, conform with the following requirements:

6.8.11.1 (10) (a) Gymnasium Flooring will be Robbins Bio-Channel Classic.

6.8.11.1 (10) (b) Preparation

.1 Ensure that the requirements of concrete floor slab have a maximum 6mm variation in height within a 3000mm radius;

.2 Cover concrete slab on grade with membrane damp proofing: polyethylene membrane, lap joints 100mm and seal with mastic;

.3 Place sleepers on damp proof membrane. Shim and level sleepers, maximum surface tolerance 1:800. Install sleepers parallel to short dimension of room and space at 400mm o.c. Stagger sleepers butt joints 300mm minimum;

.4 Maintain a minimum of 15mm expansion space at walls and obstructions;

.5 Install sheathing at right angles to sleepers, stagger and offset joints;

.6 Maintain minimum of 6mm expansion space at joints between sheathing panels;

.7 Install floor sockets at locations indicated. Secure sockets housing in concrete subfloor by grouting, ensuring vertical and plumb. Secure lid and frame in floating wood floor surface flush and square.

6.8.11.1 (11) for resilient flooring and sports flooring, conform to the following requirements:

6.8.11.1 (11) (a) slip-resistant resilient flooring with a static coefficient of friction of 0.6 on level surfaces and 0.8 on ramps;

6.8.11.1 (11) (b) all seams will be welded. Areas surfaced in sheet flooring will have 150mm integral cove bases.

6.8.11.1 (11) (c) linoleum sheet flooring will be a homogenous sheet linoleum of primarily natural materials, consisting of linseed oil, wood floor, and resin binders mixed and calendared onto a natural jute backing. All seams will be welded. Areas surfaced in linoleum sheet flooring will have rubber base except where cove base is required wet areas. If cove base is noted provide butterfly joints at outside corners.

6.8.11.1 (11) (d) Rubber Stair (commercial grade):

.1 Provide heavy duty treads with diamond pattern, 6mmthick aluminum square nose;

.2 Provide tactile warning strips; 3mm thick, 1000mm x 1000 mm tile;

.3 Acceptable reference standards: Johnsonite or acceptable equivalent.

6.8.11.1 (11) (e) Rubber Base:

.1 Provide throughout except where noted otherwise, commercial grade rubber base;

.2 Rubber base will be 3mm thick, 100mm high; unless otherwise noted;

.3 Provide coved vinyl base where sheet vinyl floor is located such as washrooms and other west areas;

6.8.11.1 (11) (f) provide molded rubber base 75x100 with 10mm ventilation holes for wood flooring location;

6.8.11.1 (11) (g) sport flooring in the Weight Room will be as follows:

.1 Polyurethane – bound rubber granulated sheet covered by a seamless polyurethane top layer 11mm thick in total. The flooring will be installed complete in accordance to the manufacturer's specifications including games lines. Colour/pattern as selected by Owner from manufacturer's latest standard colour/pattern range. Flooring will be Robbins (Pulastic Classic 100) or equal;

.2 Rubber – 10mm thick vulcanized rubber (2 layer-thick type) glue down. Colour/pattern as selected by Owner from manufacturer's latest standard colour/pattern range.

Flooring will be Robbins (Galaxy Ultra) or equal Flooring Application;

.3 Prepare sub-floors and install sports flooring in accordance with the manufacturer's directions;

.4 The preferred usage of resilient flooring will limit the use of sheet goods to above grade only. Resilient tile is the sole product recommended for concrete slab-on-grade applications;

.5 Lay resilient sheet flooring with seams parallel to Facility lines to produce a minimum number of seams. Border widths minimum half width of full materials;

.6 Run sheets in direction of traffic. Double cut sheet joints and continuously seal according to manufacturer's printed instructions;

.7 Continue flooring at centre line of door in openings where adjacent floor finish or colour is dissimilar;

.8 Terminate flooring at centre line for door in openings where adjacent floor finish or colour is dissimilar;

.9 Install 32mm wide tapered black vinyl strip at open edges of resilient flooring;

.10 Install base after resilient flooring and any adjacent carpet have been installed.

6.8.11.1 (12) provide ceramic tiles as follows:

6.8.11.1 (12) (a) meets the performance standard of the TTMAC;

6.8.11.1 (12) (b) installed with low toxicity cement; and

6.8.11.1 (12) (c) grout will be complimentary colour with the tile.

6.8.11.1 (13) provide textile floor covering as follows:

6.8.11.1 (13) (a) provide acoustic, washable, anti-microbial textile floor covering for use in Music Room (Band). Acceptable products will be Forbo Flotex or acceptable equivalent.

6.8.12 Acoustic Treatment

6.8.12.1 (1) The Design-Builder will provide acoustic treatment where sound attenuation, soundproofing or other sound control measures are necessary.

6.8.12.1 (2) Refer to Appendix 1C – Acoustic and Noise Control Ratings.

6.8.13 Painting and Protective Coatings

6.8.13.1 (1) Painting.

The Design-Builder will:

6.8.13.1 (1) (a) perform all exterior and interior painting and decorating work in accordance with MPI Painting Manual premium grade requirements;

6.8.13.1 (1) (b) ensure all painting and decorating work is inspected by the local MPI Accredited Quality Assurance Association's Paint Inspection Agency;

6.8.13.1 (1) (c) provide local MPI Accredited Quality Assurance Association's Guarantee;

6.8.13.1 (1) (d) perform all painting and protective coating work to MPI Standards Premium Classification as referenced in their MPI Architectural Painting Manual. All material used will be in accordance to MPI list of approved products for surface to receive the finish;

6.8.13.1 (1) (e) ensure paint material for each paint system is from the same manufacturer;

6.8.13.1 (1) (f) not mix manufacturers' products;

6.8.13.1 (1) (g) make available and keep up to date the Material Safety Data Sheets (MSDS) for paints and solvents used on the Site, and provide such materials to the Owner at or prior to Substantial Completion;

6.8.13.1 (1) (h) note that it is preferred that all interior site applied coatings have a Green Seal of approval or at least be LEED compliant;

6.8.13.1 (1) (i) ensure exterior paints and painting are of a quality to protect the substrate materials from weather and climate conditions;

6.8.13.1 (1) (j) achieve a visually harmonious and aesthetically coordinated appearance across all areas of the Facility;

6.8.13.1 (1) (k) ensure exterior and interior finish materials have surface finishes either as manufactured and integral to the finish material or as applied to the surface of the finish material by paint or special coating;

6.8.13.1 (1) (l) ensure that exterior and interior materials subject to corrosion from exposure to moisture or other corrosive agents and where painting is deemed to be insufficient protection receives a special protective coating. Such materials include exterior and interior structural, galvanized, and miscellaneous steel.

6.8.13.1 (1) (m) ensure all finishes have a gloss of 45 – 55 @ 60 @ to be a Semi-Gloss;

6.8.13.1 (1) (n) ensure cabinets and doors are 60 @ 70% to be a High-Gloss; and

6.8.13.1 (1) (o) not use satin or semi-gloss.

6.8.13.1 (2) Guidelines for Colour Selection

The Design-Builder will select the paint colors in accordance with the following:

6.8.13.1 (2) (a) all ceilings will be white;

6.8.13.1 (2) (b) gymnasium wall colours will be custom chosen through consultation with the Owner. It will be noted, however, that some colours may be precluded because they degrade visibility of balls and badminton shuttlecocks, or absorb too much room light;

6.8.13.1 (2) (c) interior paint materials will be of a quality to withstand regular or repeated cleaning as the function of the area dictates;

6.8.13.1 (2) (d) handrails, doors, and frames will be painted a contrasting colour from walls in consideration of the visually impaired;

6.8.13.1 (2) (e) specialty areas i.e. administration offices, staffrooms, counselling suites, will have custom colours as required and approved by the Owner.

6.8.13.1 (3) Application

The Design-Builder will:

6.8.13.1 (3) (a) apply all materials by brush or roller;

6.8.13.1 (3) (b) apply all materials according to the manufacturer's recommendations;

6.8.13.1 (3) (c) only thin the paint if necessary and then only up to the recommended amount;

6.8.13.1 (3) (d) ensure finish work is uniform in colour and appearance, smooth and free from excessive flooding, brush marks, lap marks, runs, sags, or any film defects;

6.8.13.1 (3) (e) prime all areas of bare concrete in addition to double coated;

6.8.13.1 (3) (f) wash any areas of high gloss with trisodium phosphate and scuff sanded to remove gloss prior to painting; and

6.8.13.1 (3) (g) complete paint air vapour test procedures in occupied spaces on a daily or shift basis.

6.8.13.1 (4) Guarantee

The Design-Builder will:

6.8.13.1 (4) (a) furnish for the Facility an MPI two-year guarantee, on or prior to Substantial Completion, warranting that the work has been performed in accordance with the standards and requirements incorporated in the MPI Architectural Painting Specifications Manual;

6.8.13.1 (4) (b) provide the inspection procedure in the MPI Architectural Painting Specification Manual, and ensure that the frequency of inspections is sufficient to ensure adequate quality control procedures in accordance with the manual;

6.8.13.1 (5) Environmental Protection

The Design-Builder will:

6.8.13.1 (5) (a) measure air quality during painting in accordance with the WorkSafeBC Regulations;

6.8.13.1 (5) (b) use materials used that are lead- and mercury-free;

6.8.13.1 (5) (c) ensure seamless epoxy wall coatings are two-component, high solids, Zero or low VOC, solvent-free, epoxy glaze wall coating, and will be abrasion, chemical, and UV-resistant;

6.8.13.1 (5) (d) ensure paint materials are rated under Environmental Notation System with acceptable VOC ranges as listed in the MPI Approved Product List under “E” ranges;

6.8.13.1 (5) (e) use only those materials having a minimum MPI “Environmentally Friendly” E2 rating based on VOC (EPA Method 24) content levels;

6.8.13.1 (6) Paint Schedule

The Design-Builder will perform the painting work in accordance with the following requirements:

6.8.13.1 (6) (a) Gloss Levels - Classrooms
- .1 Flat latex on ceilings.
- .2 Semi-gloss waterborne on walls.
- .3 Gloss waterborne will be on doors and cabinets; steel doors and frames to receive LEED compliant alkyd.

6.8.13.1 (6) (b) Gloss Levels: Office Areas, Staff Rooms, Counsellor Offices, and offices:
- .1 Flat latex on ceilings.
- .2 Semi-gloss waterborne on walls.
- .3 Gloss waterborne on doors and cabinets.
- .4 Gloss LEED compliant alkyd on doors and cabinetry.

6.8.13.1 (6) (c) Gloss Levels – Gymnasiums and Hallways:
- .1 Flat on ceilings.
- .2 Semi-gloss on the walls.
- .3 Gloss LEED compliant alkyd on doors.
- .4 Flat latex on ceilings.
- .5 Semi-gloss waterborne on walls.
- .6 Gloss LEED compliant alkyd on doors.

6.8.13.1 (6) (d) Gloss Levels – Washrooms, Boiler Rooms, and Shop Areas:

.1 Semi-gloss on ceilings.
.2 Semi-gloss on walls/partitions.
.3 Gloss LEED compliant alkyd on doors.

6.8.14 Speciality Coverings

The Design-Builder will:

6.8.14.1 (1) ensure that materials and workmanship conform to the MPI Architectural Painting Specification Manual (latest edition);

6.8.14.1 (2) provide wall coverings as required on interior walls to satisfy aesthetic considerations beyond the application of paint and create a comfortable working environment in staff work areas, and a safe and inviting environment in student areas;

6.8.14.1 (3) not use wall coverings in areas that may have excessive moisture present or require high and frequent maintenance;

6.8.14.1 (4) use sealers and adhesives that are non-toxic, water-based type and meet requirements of Canadian “Eco Logo” program or equivalent. TVOC emissive content will not be more than 20 grams per litre; and

6.8.14.1 (5) for gymnasium floors,

6.8.14.1 (5) (a) mark with games lines for basketball, volleyball and badminton courts;

6.8.14.1 (5) (b) prepare a layout pattern of the game lines for review by the Owner prior to installation; and

6.8.14.1 (5) (c) place the School logo on centre court, such logo to be provided by the Owner.

6.9 Specialties (Division 10)

6.9.1 The Design-Builder will provide specialty products manufactured for the specific purpose intended and will install them in accordance with the manufacturer's directions.

6.9.2 Tackboards and Whiteboards

The Design-Builder will:

6.9.2.1 (1) provide tackboards with surfaces of a type and quality to allow pin penetration of the surface materials and have reasonable resistance to deterioration;

6.9.2.1 (2) provide whiteboards with surfaces of a type to allow use of felt-type writing instruments and allow erasing and cleaning with minimal effort;

6.9.2.1 (3) ensure tackboards and whiteboards are provided complete with manufactured frames and accessory trays;

6.9.2.1 (4) provide tackboards and white boards that are sized at 1220mm x 2440mm and as per Appendix 1J – Auditorium Specifications;

6.9.2.1 (5) ensure whiteboard writing surfaces are porcelain ceramic on steel surface, magnetic, scratch and abrasion-resistant, have maximum contrast, glare control, and reflectivity, and scratch and abrasion-resistant;

6.9.2.1 (6) provide sliding whiteboards where specified (refer to the Functional Program and the School Room Data Sheets);

6.9.2.1 (7) ensure that lamination adhesive used for tackboards and whiteboards are non-toxic, water-based adhesive; and

6.9.2.1 (8) provide 2 side-by-side whiteboards, butt jointed in the middle without metal frame; and

6.9.2.1 (9) provide clear anodized aluminum frame around the perimeter of whiteboard assembly.

6.9.3 Compartments and Cubicles

The Design-Builder will:

6.9.3.1 (1) provide compartments and cubicles that include toilet partitions, change cubicles, shower partitions;

6.9.3.1 (2) ensure exposed surfaces are permanent, water-resistant, corrosion-proof, and readily cleaned and maintained;

6.9.3.1 (3) secure partitions and standards to the floor or ceiling structure, and ensure such partitions and standards are resistant to lateral loading and impact;

6.9.3.1 (4) ensure compartment/cubicle doors are of material matching the partitions and include permanent, purpose-made hardware. Doors and hardware will provide privacy and security and be Accessible/Barrier-Free as required;

6.9.3.1 (5) provide curtain tracks and curtains that conform to the following:

6.9.3.1 (5) (a) heavy duty motorized top rolling gym divider curtain for Gymnasium Small; and

6.9.3.1 (5) (b) curtain may be used in lieu of doors where and as appropriate;

6.9.3.1 (6) provide toilet partitions that are solid core phenolic or stainless steel with embossed surface in accordance with the following:

6.9.3.1 (6) (a) sheet metal will be galvannealed steel conforming to ASTM A653 with minimum ZF001 (A01) zinc coating. Finish for steel surfaces will be polyester, baked enamel;

6.9.3.1 (6) (b) stainless steel will be Type 304 conforming to ASTM A240 with No. 4 finish; Exposed Steel Surfaces and Non-ferrous surfaces: Satin finish; and

6.9.3.1 (6) (c) stainless Steel hardware will be concealed.

6.9.3.1 (7) provide change cubicle partitions that are solid core phenolic or stainless steel with embossed surface, and where not adjacent to showers, partitions will conform to quality assurance requirements specified for toilet partitions.

6.9.3.1 (8) provide shower partitions that are solid phenolic laminated thick stock, factory-laminated with flat finish both faces of core and conforming to CAN3-A172 or NEMA LD3.

6.9.4 Wall Guards and Corner Guards, Handrails, Wall Protection, Door Edge and Door Frame Protection

6.9.4.1 (1) Wall and corner guards

The Design-Builder will:

6.9.4.1 (1) (a) provide protection of walls and exposed wall corners at all corners and wall surfaces exposed to damage due to impact from traffic such as AV and other equipment carts, custodial material transport and cleaning equipment;

6.9.4.1 (1) (b) ensure that materials selected are appropriate to the amount and degree of impact anticipated. Corner guards will be stainless steel (SS). Refer to the School Room Data Sheets;

6.9.4.1 (1) (c) ensure that all corridors and areas for circulation and or teaching are protected up to 1220mm AFF with finished white birch plywood w/hardwood cap;

6.9.4.1 (1) (d) ensure that all service and storage rooms are protected up to 1220mm AFF with fiberglass reinforced panels (FRP) c/w all accessories, caps, corners;

6.9.4.1 (1) (e) for walls and exposed surfaces - Gymnasium and spaces intended for athletic activity, ensure such space is protected up to 4880mm AFF with finished white birch plywood w/hardwood cap. Surfaces above the cap for 2440mm protected with painted perforated fiber (tectum) panels. All surface joints will be scored for a smooth finish. Treatment will be consistent with requirement to conform to Appendix 1C – Acoustic and Noise Control Ratings; and

6.9.4.1 (1) (f) for walls and exposed surfaces – Performing Arts, Music, Drama, provide wall and ceiling finishes and treatment consistent with requirement to conform to the School Room Data Sheets and Appendix 1C – Acoustic and Noise Control Ratings.

6.9.4.1 (2) Handrails and Guardrails

6.9.4.1 (2) (a) The Design-Builder will ensure that all handrails are painted metal handrails complete with painted steel supports. Handrail sizes are to be in accordance with VBBL. Aluminum guardrails and handrails will not be acceptable.

6.9.4.1 (3) Wall protection

6.9.4.1 (3) (a) The Design-Builder will ensure that wall protection, handrails and corner guard products are stain-resistant to pen marks, paint, and graffiti, and will withstand commercial cleaners without fading or staining. These products will also contain anti-microbial additives to retard mildew and bacterial growth.

6.9.4.1 (4) Door Edge and Door Frame Protection

6.9.4.1 (4) (a) The Design-Builder will provide standard pre-formed vinyl/acrylic extrusions with matte finish pebblette grain surface 1200mm high.

6.9.5 Metal Lockers

The Design-Builder:

6.9.5.1 (1) will provide individual and shared storage facilities for students and staff and in accessible secure areas suitable for students and staff to secure their personal effects;

6.9.5.1 (2) may provide metal lockers as such storage facilities;

6.9.5.1 (3) will provide metal lockers of the sizes, numbers, and groupings as determined by the Owner. General student lockers to be half height. Minimum dimensions will be 15” W x 12” D x 36” T;

6.9.5.1 (4) will not provide stacked lockers unless against walls;

6.9.5.1 (5) will ensure lockers are of sheet metal that is galvannealed steel conforming to ASTM A653 with ZF001 (A01) zinc coating;

6.9.5.1 (6) will ensure finish for steel surfaces will be polyester baked enamel. Colour will be reviewed by the Owner from the colour and finish palette prepared by the Design-Builder;

6.9.5.1 (7) will provide single tier metal lockers for staff use complete with provision for locking with padlock, number plates, sloped top and hanging hooks;

6.9.5.1 (8) will provide single, double, or multiple-tier metal lockers for students with padlock, number plates, and hanging hooks;

6.9.5.1 (9) provide storage systems for materials in designated storage areas;

6.9.5.1 (10) may use adjustable shelving systems specifically manufactured for storage purposes, such as plywood or steel-slotted angle industrial shelving for bulk materials of plastic laminate-faced plywood for clean storage; and

6.9.5.1 (11) may provide mobile, high-density storage system for files designed to make maximum use of available space by eliminating need for access aisle for each run of shelving. System will be installed and braced to resist seismic loads.

6.9.6 Washroom Accessories

The Design-Builder will:

6.9.6.1 (1) provide accessories for washroom functions in public, student, and staff washrooms as required. Type, size, and number of accessories will be determined by the numbers and categories of users.

6.9.6.1 (2) provide as a minimum staff and student washroom accessories as follows:

6.9.6.1 (2) (a) Soap dispensers: Bobrick B-2111 (vertical tank, 40 oz.). Soap dispenser will be screwed into wall. Adhering soap dispensers to the mirrors is not acceptable;

6.9.6.1 (2) (b) Soap dispensers in Accessible/Barrier-Free washrooms: Bobrick B 822 or B2226 (lavatory mounted) Counter or Sink - mounted as per design;

6.9.6.1 (2) (c) Toilet paper dispensers: Bobrick Surface-Mounted Vandal-Resistant Toilet Tissue Dispenser double roll (B-265);

6.9.6.1 (2) (d) No hand towel dispensers in Girls and Boys washrooms;

6.9.6.1 (2) (e) Automatic Electronic Hand Dryer: Comac- 100 ONE Model C-100000000 Universal Voltage. 150 CFM output, 67 decibel, universal voltage - auto-sensing circuit instantly adjusts to 115, 208 or 230 volts. Complete 10-year warranty for the entire dryer. Material: Cast Zinc, Steel. Finish: White Porcelain Enamel;

6.9.6.1 (2) (f) Single Mirrors Bobrick: B 165 - 2436Steel channel frame;

6.9.6.1 (2) (g) Handicap grab bars (with integral tactile grip finish);

6.9.6.1 (2) (h) Handicap grab bars for Life Skills washrooms bathroom. Refer to Appendix 1B – School Room Data Sheets;

6.9.6.1 (2) (i) Coat hooks: Richelieu BP6508-140 To meet code requirements;

6.9.6.1 (2) (j) Sanitary napkin dispensers: Bobrick B-370639C – Classic Series Surface-Mounted Napkin/Tampon Vendor - Free No-Coin Mechanism

6.9.6.1 (2) (k) Baby change table will be installed in one of the Accessible/Barrier-Free washrooms on main level;

6.9.6.1 (2) (l) Sanitary napkin disposal: Frost 620. Materials: All welded steel construction (22 gauge). Surface mounted with pivoting self-closing lid and pivoting door with full length piano hinge. Dimensions: 8"W (20.3) x 13-1/4"H (33.6) x 4-1/2"0 (11.4). Finish: White epoxy.

6.9.6.1 (2) (m) Paper towel dispensers in staff rooms: single fold white dispenser by Frost Products Ltd. (101 Universal Towel Dispenser) or an acceptable equivalent;

6.9.6.1 (2) (n) Mop and broom holder in janitor rooms: Mop and Broom HolderB-239X34 Satin finish -stainless steel.

6.9.6.1 (3) provide and install in conformance to the VBBL.

6.9.6.1 (4) ensure that shower rooms or showers in washrooms include but are not limited to the following accessories:

6.9.6.1 (4) (a) shower curtain track or rod: Bobrick B-6107;

6.9.6.1 (4) (b) handicap grab bars;

6.9.6.1 (4) (c) Soap Dispensers: Bobrick B-2111 (vertical tank, 40 oz.). Soap dispenser will be screwed into wall. Adhering soap dispensers to the mirrors is not acceptable;

6.9.6.1 (4) (d) shower seat: Bobrick B-5191 solid phenolic folding shower seat;

6.9.6.1 (4) (e) shower curtain: Bobrick B-204-2;

6.9.6.1 (4) (f) shower curtain hooks: Bobrick B-204-1; and

6.9.6.1 (4) (g) robe hooks at shower stalls only: Richelieu BP 6508-140;

6.9.6.1 (5) not used recessed dispensers (such as those for paper towels, soap, and waste receptacles);

6.9.6.1 (6) ensure accessories are commercial grade and free from imperfections in manufacture and finish;

6.9.6.1 (7) ensure that washroom accessory and installation allows cleaning and maintenance of the accessory and surrounding wall area;

6.9.6.1 (8) ensure all fittings have concealed fastening for security and discouragement of tampering;

6.9.6.1 (9) provide all sinks installed in rooms other than washrooms with a paper towel dispenser;

6.9.6.1 (10) not provide paper towel dispensers at sinks that have a hand dryer;

6.9.6.1 (11) not provide accessories that adhere to mirror surfaces; and

6.9.6.1 (12) provide the washroom accessories as listed below:

6.9.6.1 (12) (a) Staff WC: dual toilet paper holder, soap dispenser, paper towel dispenser, sanitary napkin disposal, mirror;

6.9.6.1 (12) (b) Accessible WC: dual toilet paper holder, soap dispenser (counter or sink mounted), paper towel dispenser, hand dryer, grab bars, framed mirrors, sanitary napkin disposal;

6.9.6.1 (12) (c) Typical student WC: dual toilet paper holder, soap dispenser, hand dryer, no hand towel dispensers, sanitary napkin disposal, mirror;

6.9.6.1 (12) (d) Life Skills: grab bars (swing up with toilet paper holder) and a toilet paper holder), shower seat, shower curtain rod, shower curtain, shower curtain hooks, hand dryer, robe hooks, diaper disposal;

6.9.6.1 (12) (e) Hand washing areas: soap dispenser, paper towel dispenser; and

6.9.6.1 (12) (f) Janitor rooms: soap dispenser, paper towel dispenser, broom holders with shelf.

6.9.7 Projection Screens

The Design-Builder will ensure that:

6.9.7.1 (1) screens are fully recessed, heavy-duty type for electrical or manual operation;

6.9.7.1 (2) screens are listed by Underwriter's Laboratories and CSA;

6.9.7.1 (3) ensure that motor is quick reversal type, especially designed for the purpose, ball-bearing and oiled for life, with automatic thermal overload cut-out and integral interlocking gears, and include preset but adjustable limit switches to automatically stop screen fabric in the up and down positions. Stop action will be positive to prevent coasting. Roller will be mounted on two heavy-duty brackets equipped with self-aligning bearings;

6.9.7.1 (4) ensure surfaces are flame-retardant and mildew-resistant; and

6.9.7.1 (5) ensure the motor compartment will be metal-lined.

6.9.8 Flag Pole

The Design-Builder will provide and locate a flag pole in accordance with Section 6.22.8.1 (1) (f) near the main entrance of the Facility grounds.

6.10 Equipment (Division 11)

6.10.1 The Design-Builder will provide and install all equipment referenced in this section of the Schedule and or in the Functional Program, the School Room Data Sheets, Appendix 1D – Furniture Fixtures and Equipment), Appendix 1E – Childcare Centre Requirements, and Appendix 1G – Food Service Equipment.

6.10.2 The Design-Builder will provide specialty products manufactured for the specific purpose intended and will install them in accordance with the manufacturer's directions.

6.10.3 Window Washing Systems

The Design-Builder will:

6.10.3.1 (1) provide equipment or anchors to facilitate window washing; and

6.10.3.1 (2) provide a coordinated design of the window washing system, which will be subject to final approval required from Owner.

6.10.4 Athletic Equipment

The Design-Builder will provide the following athletic equipment:

6.10.4.1 (1) Removable post (Gymnasium) that conforms to the following:

6.10.4.1 (1) (a) provide floor sockets in gymnasiums with anchor projections and bronze cap for volleyball and badminton; and

6.10.4.1 (1) (b) provide sockets in storage room to suit equipment for layouts.

6.10.4.1 (2) Basketball backstops that conforms to the following:

6.10.4.1 (2) (a) glass and breakaway goal and padding, supply and install:

.1 8 ceiling suspended motor operated units;

.2 4 wall mounted foldaway units manually operated; and

.3 Product: Viking Alexander Metal Products Ltd or acceptable equivalent.

6.10.4.1 (2) (b) side swing basketball backstops will be equipped with heavy duty squared steel tubing fame;

6.10.4.1 (2) (c) provide seismic cable stays complete with pulleys. Product will be Viking Alexander Metal Products Ltd. Model Sandy B #140 or acceptable equivalent; and

6.10.4.1 (2) (d) provide backboard mounted to backstop with adjustable frame which allows adjustment of goal height from 2.4 to 3.0 metres above floor.

6.10.4.1 (3) telescopic seating system;

6.10.4.1 (4) supply and install multi-tiered rows of seats, deck components and risers on interconnected retractable, supporting structure;

6.10.4.1 (5) telescopic operation will be by means of electric operation;

6.10.4.1 (6) telescoping seating system will be wall attached, recessed and flush against the wall when stored;

6.10.4.1 (7) seat boards will be wood;

6.10.4.1 (8) installation will be complete with guardrails, handrails and closed deck;

6.10.4.1 (9) provide seating capacity for 350 seats configured as two sets of 175 seats;

6.10.4.1 (10) refer to the Functional Program for layouts and locations and the School Room Data Sheets for design details;

6.10.4.1 (11) provide and install 2 sport digital scoreboard in Gymnasium Large and 1 sport digital scoreboard in Gymnasium Small;

6.10.4.1 (12) provide 4 shot clocks in Gymnasium Large and 2 shot clocks in Gymnasium Small, in locations to be confirmed with the Owner; and

6.10.4.1 (13) provide a scoreboard approximately 1800mm high x 3050mm wide c/w all electrical and data equipment and connections, including a control console for each unit. Scoreboard will be Daktronics BB-2107 or equivalent. Shot clock will be Daktronics BB-2114 or equivalent.

6.10.5 Music Room Equipment

The Design-Builder will:

6.10.5.1 (1) provide and install modular rooms with closure panels with seamless installation as Music Practice Rooms;

6.10.5.1 (2) provide rooms that are 6 m^2 in area and 2.75 m in height complete with 915mm wide door with glass panels; and

6.10.5.1 (3) provide “Sound Lok Sound Isolation Room” by Wenger or equally rated units.

6.10.6 Fume Hoods

The Design-Builder will:

6.10.6.1 (1) provide and install fume hoods in the laboratory as noted (see the Functional Program and the School Room Data Sheets);

6.10.6.1 (2) provide fume hoods that provide superior containment, self-supporting steel structure, 18 gauge exterior steel with SEFA-8 chemical resistant part finish, 780mm high cavity opening, 675mm interior, working depth and 830mm exterior dimension; and

6.10.6.1 (3) provide fume hoods that are manufactured by Vanguard Fume Hood – H.H. Hawkins or equally rated units.

6.10.7 Library Shelving Units

The Design-Builder will:

6.10.7.1 (1) provide a cantilever shelving system that is metal welded 16-gauge tubular frame, painted with a tough baked enamel finish complete with all required support components to meet structural requirements including corner fillers;

6.10.7.1 (2) provide shelf units that consist of both adjustable single and double face with wood ends and tops;

6.10.7.1 (3) provide accessories for periodical display, media racks and newspaper racks; and

6.10.7.1 (4) provide a system by Tennsco or equally rated systems.

6.10.8 Food Services (Canteen) and Equipment (Division 11)

The model of operation of the Facility is to provide an excellent food product for the students within a Canteen operation. The Design-Builder will:

6.10.8.1 (1) provide a commercial kitchen area with equipment manufactured for the specific purposes intended and installed in accordance to the manufacturers' standards and directions;

6.10.8.1 (2) provide the following in relation to food services:

6.10.8.1 (2) (a) Canteen itemized equipment layout;

6.10.8.1 (2) (b) Canteen equipment connection point drawings;

6.10.8.1 (2) (c) Facility conditions drawing(s) for Canteen equipment;

6.10.8.1 (2) (d) elevations and section details for custom fabricated Canteen equipment items;

6.10.8.1 (2) (e) itemized Canteen equipment specifications; and

6.10.8.1 (2) (f) catalogue specifications sheets for all manufactured equipment items;

6.10.8.1 (3) provide commercial kitchen equipment as required for the Canteen operation of the facility for the student and staff population;

6.10.8.1 (4) design the space mainly as a Canteen service operation, with storage, preparation, cooking and service areas for this operation;

6.10.8.1 (5) provide adequate space within the area for the following functional requirements:

6.10.8.1 (5) (a) administration (desk);

6.10.8.1 (5) (b) janitor and chemical storage;

6.10.8.1 (5) (c) dry storage;

6.10.8.1 (5) (d) refrigerated/frozen storage;

6.10.8.1 (5) (e) preparation;

6.10.8.1 (5) (f) cooking;

6.10.8.1 (5) (g) washing;

6.10.8.1 (5) (h) service;

6.10.8.1 (5) (i) miscellaneous self-use station (with sink and microwaves) in seating area.

6.10.8.1 (6) ensure all kitchen equipment is fabricated and installed to the current codes and requirements and the requirements of the authority having jurisdiction at the time of installation including SMACNA Guidelines for Seismic Restraint of Commercial Kitchen Equipment;

6.10.8.1 (7) ensure equipment complies with the current applicable section of NSF/ANSI Standard for Kitchen Equipment;

6.10.8.1 (8) ensure all equipment is inspected by the local hydro authority and carry CSA and ULC approval;

6.10.8.1 (9) ensure each piece of equipment will be accompanied by a label or certificate of approval;

6.10.8.1 (10) ensure equipment design and fabrication conforms with guidelines of the National Sanitation Foundation and per the authority having jurisdiction (including the local environmental health office);

6.10.8.1 (11) ensure gas equipment conforms to the Canadian Gas Association and Canadian Standard Association standards;

6.10.8.1 (12) ensure equipment meets or exceeds the current energy saving guidelines in effect at the time of installation;

6.10.8.1 (13) where possible, provide mobile equipment to allow for movement/ repositioning, ease of replacement and ease of cleaning; and

6.10.8.1 (14) ensure that functional areas to contain equipment as noted in Appendix 1G – Food Services Equipment.

6.10.9 Food Services Equipment Requirements

The Design-Builder will:

6.10.9.1 (1) provide commercial kitchen equipment as set out in the Appendix 1G – Food Services Equipment;

6.10.9.1 (2) ensure mechanical work and electrical work related to the food service equipment, is concealed within Facility walls or ceilings wherever possible; or concealed within custom fabricated equipment where required;

6.10.9.1 (3) install equipment as such to provide for adequate servicing and cleaning per current codes and requirements and the requirements of the authority having jurisdiction at the time of installation;

6.10.9.1 (4) ensure that the service counter customer side finish coordinate with the décor requirements of the project and ensure the material utilized allows for the conditions of the functional/cleaning requirements of the area;

6.10.9.1 (5) provide finished work that is perfectly true and plumb with no warping, buckling or open seams. All edges, hidden or exposed, must be ground smooth and rounded. Rivet heads, weld marks, or other imperfections are not acceptable;

6.10.9.1 (6) ensure materials for fixed surfaces are impervious to moisture, corrosion resistant, smooth and able to withstand regular cleaning and sanitizing;

6.10.9.1 (7) ensure stainless steel is ASTM-A167-81A, (18-8 Analysis) type 304 cold rolled and annealed, No. 4 finish one side, 180 grit finish, and free of buckles, pits, warps and imperfections. Ensure that the direction of grain matches throughout the units;

6.10.9.1 (8) ensure all welding conforms to the requirements of CSA specifications and be performed by fabricators who are approved by the Canadian Welding Bureau and CSA standards. Exposed welds will be filed or ground smooth and flush and polished to match surfaces. All exposed welds will be continuous; and

6.10.9.1 (9) ensure the gauge of metal and methods of construction is adequate for the intended purposes of the equipment or structure. Finished equipment will be rigid when assembled and installed;

6.10.10 Manufactured Food Services Equipment

The Design-Builder will:

6.10.10.1 (1) provide equipment from a recognized manufacturer of commercial kitchen equipment with local service representation;

6.10.10.1 (2) ensure that cabinet type equipment have locks;

6.10.10.1 (3) provide refrigeration equipment with integral digital thermometers and alarm systems;

6.10.10.1 (4) ensure equipment is on casters with brakes where possible;

6.10.10.1 (5) ensure gas equipment has quick disconnects with swivel and integral shut-off valves and restraining cords;

6.10.10.1 (6) ensure mobile cooking equipment under the exhaust hood(s) have positional brackets; placed and secured for back casters.

6.10.11 Custom Millwork

The Design-Builder will:

6.10.11.1 (1) provide custom fabricated millwork equipment from a company specializing in commercial millwork cabinetry;

6.10.11.1 (2) provide custom fabricated millwork, counters, cabinet, units as required to meet the fully functional commercial kitchen representation; and

6.10.11.1 (3) ensure cabinet type equipment has commercial grade plastic laminate finish; swing/sliding doors, concealed hinges with locks; drawers with locks; internal adjustable shelves; base to have stainless steel finish.

6.10.12 Custom Stainless Steel Work

The Design-Builder will:

6.10.12.1 (1) provide custom fabricated stainless steel equipment from a company specializing in commercial kitchen equipment with local service representation;

6.10.12.1 (2) provide custom fabricated stainless steel work tables, counters, cabinet, sink units and shelving as required to meet the fully functional commercial kitchen representation;

6.10.12.1 (3) ensure cabinet type equipment and drawers have locks;

6.10.12.1 (4) use stainless steel that is Type 304, Number 4 finish, 180 grit, free from pits and imperfections, and use:

6.10.12.1 (4) (a) 16 gauge (1.587 mm) - Utilized for all free-standing sinks, dish tables, counter tops, over shelves, single pan doors, stainless steel slides, stainless steel grids and undershelves over 1220 mm long. Hat sections/channels; unexposed galvanized, exposed stainless steel. Exposed shelf brackets Sheet material for counter tops, tables, shelves and similar forms will be straight lengths in one continuous sheet (unless over 3 metres long).

6.10.12.1 (4) (b) 16 gauge (1.587 mm) - Utilized for all undershelves less than 1220 mm long, stainless steel bins (fixed or mobile), counter top sinks and vertical surfaces. Ducts; unexposed galvanized, exposed stainless steel.

6.10.12.1 (4) (c) 18 gauge (1.27 mm) - Utilized for the chassis of all fixtures, double pan doors and drawer fronts.

6.10.12.1 (4) (d) 20 gauge (0.96 mm) - Utilized for all drawer bodies and door linings, refrigerator linings, drawer pans with 2B finish, dishwasher ducts, or a specified.

6.10.12.1 (4) (e) Tubing 16 gauge (1.58mm) wall.

6.10.12.1 (5) ensure sheet material for counter tops, tables, shelves and similar forms are straight lengths in one continuous sheet (unless over 3 metres long);

6.10.12.1 (6) ensure tables and counters over 1800mm in length have a minimum of 4 legs;

6.10.12.1 (7) for pot sink or dish tables, ensure that work tops slope toward the sinks or dishwasher as required at a slope of 8mm per metre. The front edge will be level with the floor;

6.10.12.1 (8) provide backsplashes for a table or counter top turned up on a 19mm radius to the height specified, then boxed or splayed. Enclose, fill and weld all exposed ends and back. Exposed backs at upturns and backsplashes to be closed with stainless steel back panel to the bottom of the backsplash. Panels will be removable as required for access to mechanical and electrical work. Backsplashes will be sealed to the wall with food safe clear silicone;

6.10.12.1 (9) provide legs and bracing t industry standard 41mm O.D. stainless steel tubular. Leg spacing to be a maximum of 1600mm apart, 760mm front to back with adjustable bullet feet;

6.10.12.1 (10) provide sink bowls that are 2.0mm stainless steel integrally welded into the table or counter. All welded, all coved, radiused 19mm both vertically and horizontally and polished. Slope sink bottom to drain. Multiple sinks to have 18 gauge stainless steel apron to conceal gap between bowls;

6.10.12.1 (11) ensure all faucets are from the same manufacturer; and

6.10.12.1 (12) provide art sinks that are one-piece integral stainless-steel with integral stainless-steel back splash. Backsplash height is to be min. 400mm.

6.10.13 Exhaust Hood(s) and Fire Suppression System(s)

The Design-Builder will:

6.10.13.1 (1) provide NFPA96 & ULC listed low air volume hood(s) with demand ventilation (control) system(s) and integral wet chemical fire suppression system(s) as required by current codes and requirements and the requirements of the authority having jurisdiction at the time of installation;

6.10.13.1 (2) ensure the fire suppression system(s) will be interconnected with the Facility system(s);

6.10.13.1 (3) provide handheld fire extinguishing unit(s) as required for the part of the Facility.

6.10.14 Equipment by Owner or Operator

6.10.15 The Design-Builder will:

6.10.15.1 (1) allocate services and space for the following equipment supplied by the Owner or Operator and as noted on Appendix 1G – Food Services Equipment:

6.10.15.1 (1) (a) Coffee maker w/ filter system;

6.10.15.1 (1) (b) Juice dispenser;

6.10.15.1 (1) (c) Hot water dispenser;

6.10.15.1 (1) (d) 6 residential grade microwave ovens;

6.10.15.1 (1) (e) Cash register(s);

6.10.15.1 (1) (f) Computer;

6.10.15.1 (1) (g) Waste bins; and

6.10.15.1 (1) (h) Hot chocolate dispenser.

6.10.16 Canteen (Commercial Kitchen) Room Requirements

The Design-Builder will:

6.10.16.1 (1) ensure all surfaces meet the current codes and requirements of a commercial kitchen establishment and the authority having jurisdiction at the time of installation;

6.10.16.1 (2) ensure the area will be vermin resistant;

6.10.16.1 (3) provide a fully sealed, water-impermeable, acid resistant, slip resistant floor made of heavy duty floor material i.e. slip resistant epoxy or sheet vinyl, with integral coved wall base. Installation slope to provide for no pooling of water under equipment or toward Facility walls;

6.10.16.1 (4) provide smooth, watertight, washable walls;

6.10.16.1 (5) use Fibreglass Reinforced Panel (FRP) or equivalent, at all exposed Facility walls within the Dish/Pot Wash area at minimum. FRP is required within the Dish/Pot Wash area at minimum. FRP or equivalent is accepted at all other exposed wall locations. FRP finish is to be embossed or pebble;

6.10.16.1 (6) provide stainless steel insulated panels from the underside of the hood to the architectural wall base or a stainless steel service wall at the cooking bank(s), as noted in Appendix 1G – Food Services Equipment;

6.10.16.1 (7) ensure all exposed wall corners are protected with stainless steel corner guards;

6.10.16.1 (8) provide a smooth and washable ceiling, taking into account acoustic considerations;

6.10.16.1 (9) provide for access to the ceiling area for service to service lines / ducting;

6.10.16.1 (10) provide sufficient lighting to meet the work environment conditions for the area;

6.10.16.1 (11) ensure the area has sufficient efficient artificial ventilation / make-up air, air movement, and cooling for use of the area;

6.10.16.1 (12) ensure access doors/doorways are adequately sized for the installation and removal of equipment; and

6.10.16.1 (13) ensure the area is fully secured from adjacent areas to ensure no after hour, untrained/unsupervised use.

6.11 Furnishings (Division 12)

6.11.1 Window coverings will allow control of exterior light entering the room during daylight hours and provide privacy during daylight and non-daylight hours.

6.11.2 Where black-out function is required at windows and sidelights, provide materials, tracks, seals and operation suited to the purpose. Refer to the School Room Data Sheets

6.11.3 The Design-Builder will:

6.11.3.1 (1) ensure that all window coverings are designed and manufactured using materials and mechanisms that would minimize cleaning and maintenance operations;

6.11.3.1 (2) provide window coverings as follows:

6.11.3.1 (2) (a) to all exterior windows, roller shades are preferred but other products will be considered providing they provide privacy, sun and heat control consistent with the energy management plan;

6.11.3.1 (2) (b) to all interior windows. Refer to the School Room Data Sheets;

6.11.3.1 (2) (c) all window coverings will be easy to remove and clean; and maintain;

6.11.3.1 (2) (d) blinds between glass is not acceptable; and

6.11.3.1 (2) (e) window coverings higher than 3050mm AFF will be motor operated;

6.11.3.1 (3) ensure that shading fabric is PVC or vinyl-coated polyester or fibreglass yarn;

6.11.3.1 (4) ensure that shading fabric is waterproof, washable, rot-proof, flame-resistant, fungal and bacteria-resistant, colourfast to light, glare-reducing, and able to control heat gain and provide external visibility;

6.11.3.1 (5) ensure that shading fabric for window shade systems pass Small Scale Vertical Burn requirements in accordance with CAN/ULC-S109 or NFPA-701;

6.11.3.1 (6) test shading fabric for window shade systems in accordance with ASHRAE Standard 74073 for shading coefficient, fungal resistance in accordance with ASTM G21, and bacterial resistance; and

6.11.3.1 (7) provide horizontal blinds as follows:

6.11.3.1 (7) (a) blinds will be mono-control single cord system and provide rotating and traversing action. Vanes will be aluminum alloy with baked enamel finish or fabric. Fabric will be waterproof, washable, rot-proof, flame-resistant, colourfast to light, and fungal and bacteria-resistant; and

6.11.3.1 (7) (b) blinds will have high tenacity, woven polyester fibre lift cords, electro-galvanized coated head channel and bottom rail, and cord lock.

6.12 Conveying Equipment (Division 14)

6.12.1 The Design-Builder will:

6.12.1.1 (1) provide an elevator that conform to all applicable codes and regulations and Section 2.1 – Standards of Design and Construction;

6.12.1.1 (2) design the elevator systems to accommodate the requirements and needs of the School and the Childcare Centre in a manner which contributes to the overall efficiency and effectiveness of student movement and Facility operations;

6.12.1.1 (3) ensure that the elevator supports access for people and materials, to all functional areas of the School and Childcare Centre. Elevator access to all Facility levels, including mechanical levels, will be provided by one elevator;

6.12.1.1 (4) ensure that the equipment provided has a proven track record of at least five years field operation in Canada in similar environments and of similar configuration;

6.12.1.1 (5) provide non-proprietary controls, tools and technology. This requirement includes submitting a signed copy of the form titled ‘Non- Proprietary Equipment Controls and Tools’.

6.12.1.1 (6) submit one backup copy of the control system software and of the dedicated service tool required for maintenance for the Owner’s exclusive use;

6.12.1.1 (7) provide a machine room-less traction elevator with the following characteristics:

6.12.1.1 (7) (a) Quantity: One;

6.12.1.1 (7) (b) Rated Net Capacity of 1814 kg (4000 lb);

6.12.1.1 (7) (c) Landing Served: All levels;

6.12.1.1 (7) (d) Speed: 150 ft/minute;

6.12.1.1 (7) (e) Cab clear inside dimensions:

6.12.1.1 (7) (f) Approximately 2283mmm wide X 1881mm deep;

6.12.1.1 (7) (g) Cab Height: 2438mm;

6.12.1.1 (7) (h) Entrance: 1219mm wide X 2134mm high;

6.12.1.1 (7) (i) Main Power Supply: 208 Volts + 5%, three-phase;

6.12.1.1 (7) (j) Operation: Simplex;

6.12.1.1 (7) (k) AC gearless machine;

6.12.1.1 (7) (l) Microcomputer based control system;

6.12.1.1 (7) (m) Emergency communication system;

6.12.1.1 (7) (n) Conform to the seismic requirements of seismic zone;

6.12.1.1 (7) (o) Interconnect elevator control system with building fire alarm system;

6.12.1.1 (7) (p) Automatic standby power operation with manual override;

6.12.1.1 (8) provide elevator cab finishes as follows:

6.12.1.1 (8) (a) Flooring: non-slip rubber flooring;

6.12.1.1 (8) (b) Threshold: Aluminum;

6.12.1.1 (8) (c) Walls: Plastic Laminate;

6.12.1.1 (8) (d) Handrails and bumper rails: brushed stainless steel;

6.12.1.1 (8) (e) Door finish: brushed stainless steel;

6.12.1.1 (8) (f) Ceiling finish: panels – polygala translucent frame – brushed aluminum;

6.12.1.1 (8) (g) Lighting – T-5 fluorescent;

6.12.1.1 (8) (h) Protective pad hooks and quilted fire; and

6.12.1.1 (8) (i) retardant protective pads: Pad to be hung from suspended ceiling.

6.12.1.1 (9) provide standard entrance jamb tactile markings on both jambs, at all floors;

6.12.1.1 (10) provide car operating panel with all push buttons, key switches, and message indicators for elevator operation. Buttons will be with amber illumination (halo) and raised text and Braille marking on left hand side;

6.12.1.1 (11) provide a directional lantern in the car entrance, visible from the corridor. The lantern must indicate the direction in which the car is to travel when the car stops and the doors are opening along with a sounding chime. The chime must sound once for up and twice for down;

6.12.1.1 (12) provide keyed access to the elevator which serves any mechanical levels;

6.12.1.1 (13) provide separate dedicated openings for School and Childcare Centre;

6.12.1.1 (14) School: Provide stops and dedicated opening at ground floor and all floors serving School;

6.12.1.1 (15) Childcare Centre: Provide stops and dedicated opening at ground floor and the level serving the Childcare Centre;

6.12.1.1 (16) internal dimensions and layout will be compliant with code and health requirements and will accommodate following:

6.12.1.1 (16) (a) three-position strollers;

6.12.1.1 (16) (b) wheelchair;

6.12.1.1 (16) (c) stretcher access; and

6.12.1.1 (16) (d) the Childcare Centre playground equipment as described in Appendix 1E – Childcare Centre Requirements.

6.12.1.1 (17) Additional Elevator Features:

6.12.1.1 (17) (a) keyed independent service operation;

6.12.1.1 (17) (b) access card is required for the elevator serving the School and Childcare Centre;

6.12.1.1 (17) (c) return to ground function,

6.12.1.1 (17) (d) PA system connection and in-car phone;

6.12.1.1 (17) (e) provide provisions for coaxial cable for CCTV; and

6.12.1.1 (17) (f) Elevator controls need to be programmed to also be operational with Childcare Centre Keyscan access system.

6.12.1.1 (18) prior to Substantial Completion, provide a training session for the Owner personnel consisting of a review of the documentation and operation of the equipment and features;

6.12.1.1 (19) provide a commissioning report including failed components (if applicable) and programmed settings; and

6.12.1.1 (20) provide 2 years of monthly inspection visits.

6.13 General Mechanical Requirements (Division 21, 22, 23 & 25)

6.13.1 The Design-Builder will design and install the mechanical services in accordance with the Owner's Mechanical Standards provided in Appendix 1H – VSB Mechanical Standards;

6.13.2 The Design-Builder will:

6.13.2.1 (1) install mechanical services in a neat and orderly manner, orthogonal to the Facility lines defined by walls or structure;

6.13.2.1 (2) install all piping and ductwork below 2750mm from the floor within walls or service chases with the exception of drainage and domestic water piping connections to plumbing fixtures;

6.13.2.1 (3) in rooms with ceilings, install all mechanical services above the ceilings;

6.13.2.1 (4) in rooms without ceilings, install all mechanical services above the Ceiling Height.

6.13.3 Access and Maintenance

The Design-Builder will:

6.13.3.1 (1) provide adequate clear access space for all services and equipment which may require inspection, maintenance, operation, adjustment or replacement;

6.13.3.1 (2) provide access and maintenance space for all equipment in accordance with manufacturer's recommendations;

6.13.3.1 (3) in areas with suspended ceilings, install all services and equipment which may require access within 600mm of the underside of the ceiling;

6.13.3.1 (4) ensure that the ceiling system including T-bar does not obstruct access to services or equipment;

6.13.3.1 (5) not install any equipment within 4 metres of the edge of a roof;

6.13.3.1 (6) ensure that any services or equipment installed below 2750mm from the floor will only be accessible with the use of a screwdriver or Alan key to prevent unwanted access by students. Provide locks where requested by Owner;

6.13.3.1 (7) install all equipment so that it can be removed and replaced without removing other services or Facility finishes. Disassembly of the ceiling grid to facilitate equipment removal and replacement is acceptable.

6.13.3.1 (8) provide isolation valves, unions and bypass piping to allow for equipment isolation and removal without affecting operation of the remainder of the system;

6.13.3.1 (9) any equipment which requires maintenance, inspection or adjustment more once per week or more, locate in a mechanical room or other service space such as a janitor's closet; and

6.13.3.1 (10) ensure that any equipment installed on the roof is capable of being replaced using a mobile crane with a maximum capacity of 90 tons located within the school grounds. The locations for the crane will be coordinated with the Facility, civil and landscape design and identified on the record drawings.

6.13.4 Identification

The Design-Builder will:

6.13.4.1 (1) ensure that labels and tags are lamicoid plates, white writing on black background. The size and location of labels and tags and the size of lettering will suit the area and size of equipment;

6.13.4.1 (2) secure labels and tags on or adjacent to the equipment. Instrument tags will be mechanically secured to the items with brass link chain. Equipment labels will be size not less than 40 x 100mm with 6mm high letters;

6.13.4.1 (3) ensure identification tagging of equipment is consistent with the designation on the plans and in the specification.

6.13.5 Valve Tags

The Design-Builder will:

6.13.5.1 (1) ensure that all valve, except convector have valves and individual plumbing fixtures stop valves, is provided with 50mm x 30mm lamicoid tags with stamped numbers, secured by chains to the valve. Numbers will be prefixed by the letter “P” or the letter “H” indicating that the valve is on plumbing or heating service; and

6.13.5.1 (2) prepare a white print chart showing location of all valves. One copy will be provided in a non-glare glazed frame, mounted in the main mechanical room and one copy of will be inserted into each maintenance and operating manual.

6.13.6 Location of Pipe and Duct Markers and Direction Arrows

The Design-Builder will:

6.13.6.1 (1) place the pipe marker and direction arrow side by side in the bottom quarter of piping being identified;

6.13.6.1 (2) place the pipe and direction arrows at a maximum spacing between markers of 7.6 metres;

6.13.6.1 (3) place pipe and direction arrows at least once in each room that piping or ductwork passes through;

6.13.6.1 (4) place pipe and direction arrows where piping or ductwork passes through walls, partitions or floors, identify on both sides of the section;

6.13.6.1 (5) where piping or ductwork is concealed in a chase, shaft, gallery or other confined space, identify at the points of entry and leaving and at each access opening;

6.13.6.1 (6) place pipe and direction arrows at each piece of equipment the piping or ductwork is connected to;

6.13.6.1 (7) on long straight runs of horizontal piping or ductwork in open areas of buildings, galleries or tunnels, locate markers and arrows so that at least one identification is clearly visible from any point of view in operating areas of walking aisles. In no case will the distance between markers (and arrows) be more than 7.6 metres;

6.13.6.1 (8) locate markers and arrows at all major valves in a system and equipment at a point as close as is practical to the upstream side of the valve and equipment; and

6.13.6.1 (9) provide an identification nameplate for each piece of equipment, including ties, such as control valves, motorized dampers, instruments and similar

products. Secure nameplates in place, approximately at eye level if possible, with epoxy cement applied to cleaned surfaces. Locate all nameplates in the most conspicuous and readable location.

6.13.7 Access Door

The Design-Builder will:

6.13.8 supply access doors to give access to all mechanical work which may need operation, maintenance or repair but which is concealed in inaccessible construction;

6.13.9 locate access doors as inconspicuously as possible in walls and partitions and arrange mechanical work such that it is clearly within view and accessible for inspection and servicing from the access door;

6.13.10 group services to ensure the minimum number of access doors is required;

6.13.11 provide access doors of the following types:

6.13.11.1 (1) Drywall Surface: Milcor Style DW flush panel access door;

6.13.11.1 (2) Masonry and Tile Surface Milcor Style M steel prime painted (non-public areas such as janitors' closets and storerooms); Milcor Style M stainless steel with satin finish (public areas and areas used by students, teaching and administrative staff);

6.13.11.1 (3) Plastered Walls and Ceiling: Milcor Style K flush panel access door;

6.13.11.1 (4) Plaster Ceiling: Milcor Style AP recessed panel access door;

6.13.11.1 (5) Acoustical Tile: Milcor Style AT recessed panel access door;

6.13.11.1 (6) Fire Rated Construction: Milcor ULC fire rated access door;

6.13.11.1 (7) Wood Finishes: A steel frame with flush steel panel to which the finishing can be fastened. Panel will be screwed to the frame instead of hinged.

6.13.12 provide access doors that conform to the following:

6.13.12.1 (1) Flush type steel framed panel, concealed hinges;

6.13.12.1 (2) Cam type, screwdriver operated locking device on the side opposite the hinges;

6.13.12.1 (3) Prime coat of rust inhibiting paint;

6.13.12.1 (4) 300 mm x 300 mm minimum for inspection and hand access;

6.13.12.1 (5) 600 mm x 600 mm minimum, larger if indicated on drawings, where entry is required, and access is difficult;

6.13.12.1 (6) Size to suit masonry modules when located in a masonry wall; and

6.13.12.1 (7) When located in a finished floor with tile, stonework, terrazzo, carpet, resilient tile/sheet, a recessed bearing type access door is required. The door surface will have a recess to take the particular surface material and pattern.

6.13.13 Mechanical Insulation

The Design-Builder will:

6.13.13.1 (1) refer to Appendix 1H – VSB Mechanical Standards;

6.13.13.1 (2) ensure thickness and thermal performance of insulation will meet or exceed ASHRAE 90.1;

6.13.13.1 (3) ensure that mechanical insulation is applied by a licensed journeyman insulation mechanic; and

6.13.13.1 (4) ensure that mechanical insulation is applied by a licensed journeyman insulation mechanic.

6.14 Fire Suppression (Division 21)

6.14.1 The Design-Builder will:

6.14.1.1 (1) refer to Appendix 1H – VSB Mechanical Standards.

6.14.1.1 (2) provide a full sprinkler system designed and installed in accordance with NFPA 13;

6.14.1.1 (3) design the fire suppression system such that a fire pump is not required;

6.14.1.1 (4) ensure that sprinklers subject to freezing temperatures are supplied by a dry system where the use of dry sidewall sprinkler heads is not suitable. Anti-freeze systems are not acceptable;

6.14.1.1 (5) provide quick response sprinklers throughout the Facility, with temperature ratings to suit the specific hazard area;

6.14.1.1 (6) locate fire extinguishers per relevant codes and to the satisfaction of the City of Vancouver inspection department and approved for the hazard and classification of the space it serves;

6.14.1.1 (7) ensure all fire protection systems are hydraulically sized to NFPA standards;

6.14.1.1 (8) ensure all equipment and installation is in accordance with manufacturers' requirement;

6.14.1.1 (9) ensure all equipment will be ULC approved;

6.14.1.1 (10) ensure that a qualified contractor licensed and regularly engaged in such installations, install all fire protection systems and equipment;

6.14.1.1 (11) locate zone shut-off valves in accordance with the following:

6.14.1.1 (11) (a) locate zone shut-off valves such that they are visible and accessible from the floor;

6.14.1.1 (11) (b) locate in non-student areas where possible, such as janitor rooms or mechanical rooms;

6.14.1.1 (11) (c) if located in areas accessible to students' valves will be installed in a recessed cabinet with lockable door; and

6.14.1.1 (11) (d) ensure all valves controlling water flow may be monitored;

6.14.1.1 (12) install fire department connection at a location approved by the COV; and

6.14.1.1 (13) install fire extinguishers in a semi or fully recessed cabinet to the satisfaction of the authority having jurisdiction.

6.15 Plumbing (Division 22)

6.15.1 The Design-Builder will:

6.15.1.1 (1) provide individual water, fire protection, gas, sanitary, and storm services as required and sized to suit the usage needs of the Facility;

6.15.1.1 (2) provide new water service connections complete with valves, water meter and by-pass valves;

6.15.1.1 (3) provide necessary reinforced concrete thrust blocks on underground water piping as required;

6.15.1.1 (4) provide sleeve in wall or floor for service main and adequately support at wall or floor with reinforced concrete bridge;

6.15.1.1 (5) caulk enlarged sleeve and make watertight with pliable material;

6.15.1.1 (6) securely anchor service main inside to concrete wall;

6.15.1.1 (7) provide 1.2mm galvanized sheet metal sleeve around service main to 150mm above floor and 1.8 metre minimum below grade;

6.15.1.1 (8) not locate valves and fittings in external manholes or access chambers;

6.15.1.1 (9) ensure domestic water systems are to AWWA standards;

6.15.1.1 (10) design the plumbing systems will be designed to avoid disruption to the operation of the Facility during maintenance or repairs;

6.15.1.1 (11) design the systems so teaching spaces do not need to be entered when performing these functions, except for plumbing fixtures located in those rooms;

6.15.1.1 (12) ensure all isolation, maintenance, balancing, and other service valves are located in the corridor ceiling spaces are accessible from standing or when using a maximum 8-foot tall ladder;

6.15.1.1 (13) provide hose bibbs at maximum 30 m spacing at ground level as well as dedicated hose bibbs where required for special use areas including occupied roof areas;

6.15.1.1 (14) provide a minimum of 2 drinking fountains with bottle fill station per floor where classrooms are located plus one located near the gym and one near the server, using acceptable product: Water Filling Station & Single ADA Cooler, Elkay EZH20-Model EZSG8WSSK. Refer to Appendix 1H – VSB Mechanical Standards for fixture requirements;

6.15.1.1 (15) provide eye washes and emergency showers to meet WorkSafeBC standards and other applicable guidance;

6.15.1.1 (16) provide floor drain at each emergency shower location. Refer to the School Room Data Sheet;

6.15.1.1 (17) provide floor drains as identified in the School Room Data Sheets and in the following areas:

6.15.1.1 (17) (a) Mechanical rooms;

6.15.1.1 (17) (b) Washrooms; and

6.15.1.1 (17) (c) Janitors closets;

6.15.1.1 (18) include 5% future expansion allowance when sizing all plumbing systems;

6.15.1.1 (19) clearly label all systems, such as painting and labelling of all pipes, ceiling identification dots, valve tagging, and emergency valve identification signage;

6.15.1.1 (20) design and install all fixtures and equipment to manufacturer's specifications and standards;

6.15.1.1 (21) ensure that all fixtures and equipment are provided by manufacturers with supply and/or service forces located in close proximity (Metro Vancouver or the Lower Mainland, British Columbia), with replacement and maintenance parts stocked locally or readily available;

6.15.1.1 (22) ensure that water systems will provide delivery of water supplies at the required pressures to all water outlets;

6.15.1.1 (23) provide durable materials to allow for 24 hour a day operation with minimal downtime;

6.15.1.1 (24) provide easy access and serviceability and avoid interference with other services;

6.15.1.1 (25) provide backflow preventers on the incoming water service as well as at equipment source connections to meet requirements of COV Plumbing By-Law, VBBL and local Plumbing Inspector. Backflow preventers installed inside the Facility will be maximum 1.5 metres above floor and will be provided with a proper capacity drain;

6.15.1.1 (26) provide interceptors as required by COV guidelines to intercept oil, grease, dirt, and solids;

6.15.1.1 (27) provide domestic water strainer at the incoming service into the Facility;

6.15.1.1 (28) if a water booster pump is required, ensure it is designed with 100% redundancy and emergency power capability to provide uninterrupted water service and pressure in the event of malfunction, maintenance, or power loss;

6.15.1.1 (29) design all drainage systems such that the system connects to the Site services. Designs will utilize gravity drainage where possible. If a pumping system is required for subsurface, storm, or sanitary drainage, provide 100% redundancy with equipment on emergency power such that the system does not flood the mechanical space it is housed in. The sump will have twin compartments: a settling and a pumping compartment and will be sized to prevent short cycling of the pump. Provide alarm points for high water and pump failure;

6.15.1.1 (30) ensure that:

6.15.1.1 (30) (a) all piping below suspended floor slabs are supported (hung) from the concrete slab above;

6.15.1.1 (30) (b) hangers and rods are of sufficient strength and installed at intervals sufficient to carry the pipe and load at the required slope;

6.15.1.1 (30) (c) hangers and rods are corrosion resistant; and

6.15.1.1 (30) (d) light-weight fill is installed above all piping that is supported (hung) from the concrete slab above;

6.15.1.1 (31) ensure that:

6.15.1.1 (31) (a) trenches or tunnels for all underground piping are excavated to a depth slightly more than required and graded so as to secure all available fall;

6.15.1.1 (31) (b) each length of pipe is supported with concrete blocks and bricks or backfill the trench with gravel to the required depth and grade;

6.15.1.1 (31) (c) sanitary and storm lines outside of the Facility is kept as deep as practical;

6.15.1.1 (32) undertake backfilling in all trenches with sand or pea gravel where approved, 150mm below pipe and up to 150mm over top of piping, then flushed with water so as to ensure the total length of each pipe is resting on solid footing;

6.15.1.1 (33) where sewer, water or storm pipes pass through exterior walls below grade, install corbels on the exterior walls and run bridging from corbel to

undisturbed soil for the support of the pipes. 25mm thick waterproof mastic will be applied around the pipes which pass through the wall;

6.15.1.1 (34) insulate storm drainage, domestic water piping, and exposed p-traps throughout as per BCICA quality standards;

6.15.1.1 (35) where piping and / or piping components are subject to freezing, provide insulation and heat tracing on life-safety systems, the heat trace system will be monitored and alarmed for malfunction or service disruption;

6.15.1.1 (36) ensure that heat trace systems on life-safety systems will be on emergency power;

6.15.1.1 (37) for science laboratories, provide piping material that is corrosion resistant to a point such that dilution renders discharge ineffective;

6.15.1.1 (38) install cast iron connections from weeping tiles to a storm drainage system including backwater valve and cleanout;

6.15.1.1 (39) provide access for servicing of backwater valve;

6.15.1.1 (40) lubricate cleanout plugs with mixture of graphite and linseed oil;

6.15.1.1 (41) prior to Facility turnover remove cleanout plugs, re-lubricate and re-install using only enough force to ensure permanent leak-proof joints;

6.15.1.1 (42) install cleanouts as required by the local plumbing authorities;

6.15.1.1 (43) install water hammer arrestors on water lines connected to groups of fixtures, flush valves, all quick closing devices and at top of water risers. Install with an accessible isolation valve;

6.15.1.1 (44) where floor drains are located above occupied areas, provide waterproof installation; and

6.15.1.1 (45) provide an air compressor to serve the compressed air outlets in the Applied Skills – Industrial Education department. The air compressor will have a receiver with a minimum of 80 capacity and a compressor with a minimum of 5hp motor rating. The compressor will be located in a mechanical room.

6.15.2 Submersible Sump Pump Installation

The Design-Builder will:

6.15.2.1 (1) provide a shut-off valve and a check valve for each pump;

6.15.2.1 (2) ensure that valves are readily accessible from floor level and that piping is easily removable for removal of pump(s) from the sump;

6.15.2.1 (3) install the pump removal guide rail system with accessories in accordance with the manufacturer’s instructions;

6.15.2.1 (4) install float switches at the proper height in the sump and secure cable to a sump wall mounted bracket such that cables cannot twist around each other;

6.15.2.1 (5) ensure that the pump power cords and the float switch cords are of sufficient length to extend unbroken through sump pit conduit to the wall on which the starter and control panel is located;

6.15.2.1 (6) clean sumps prior to Substantial Completion;

6.15.2.1 (7) ensure that start-up of submersible pumps is performed by the manufacturer's trained technician; and

6.15.2.1 (8) provide the manufacturer's certification confirming that sump pumps and controls are operating correctly and are ready for acceptance.

6.15.3 Domestic Hot Water Systems

The Design-Builder will:

6.15.3.1 (1) calculate domestic hot water demand in accordance with ASPE Plumbing Engineering Design Handbook;

6.15.3.1 (2) ensure that domestic hot water is stored and distributed at not less than 60ºC to prevent legionella;

6.15.3.1 (3) provide mixing valves where temperatures are required to be less than 60ºC at point of use, including showers and lavatories;

6.15.3.1 (4) provide water at 60ºC for janitors sinks and kitchen sinks;

6.15.3.1 (5) design the domestic hot water system with sufficient capacity and recovery rate for the School's hot water requirements.

6.15.3.1 (6) design the domestic hot water system with a circulation system to ensure timely delivery of hot water to all fixtures;

6.15.3.1 (7) ensure that domestic hot water return piping is taken to within a minimum of 600mm of each fixture;

6.15.3.1 (8) design the domestic hot water system to prevent growth and spread of Legionella bacteria within the tanks, piping, fixtures, or any other component, using methods such as eliminating dead-leg piping, and minimizing uncirculated piping by connecting the circulation system as close as possible to fixtures'

6.15.3.1 (9) design hot water generating equipment and/or storage with a minimum of two heaters / storage tank at 50% capacity each to provide continuity of service on failure of maintenance of a single heater / storage tank;

6.15.3.1 (10) use condensing on-demand heaters for domestic hot water generation, using a centralised or a distributed strategy;

6.15.3.1 (11) locate heaters in either mechanical rooms or janitor's closets with adequate access for maintenance and inspection in accordance with manufacturers recommendations;

6.15.3.1 (12) at every location, provide sufficient wall space for one additional heater will be installed with a capped natural gas supply and identified clear route for exhaust and air intake venting; and

6.15.3.1 (13) monitor hot water supply temperatures via the BMS system and provide alarm outputs when the temperature exceeds or falls below the design setpoint.

6.15.4 Products

Refer to Appendix 1H – VSB Mechanical Standards, and use the products listed therein.

6.15.5 Cleanouts and Cleanout Access Covers

The Design-Builder will:

6.15.5.1 (1) provide caulked or threaded type extended to finished floor or wall surface;

6.15.5.1 (2) provide bolted cover plate cleanouts on vertical rainwater leaders only;

6.15.5.1 (3) ensure ample clearance at cleanout for rodding of drainage system;

6.15.5.1 (4) ensure floor cleanout access covers in unfurnished areas are round with nickel bronze frames and plates;

6.15.5.1 (5) provide round or square access covers in finished areas with depressed center section to accommodate floor finish; and

6.15.5.1 (6) ensure wall cleanout has chrome plated caps.

6.15.6 Sumps

The Design-Builder will provide reinforced concrete sumps with necessary drainage fittings, 10mm checked steel plate flush covers with gasket seal frames and anchor bolts.

6.15.7 Catch Basins

The Design-Builder will provide catch basins that:

6.15.7.1 (1) are constructed of reinforced precast concrete sections laid on poured-in-place reinforced concrete foundation pad;

6.15.7.1 (2) are complete with necessary drainage fittings with heavy duty hot asphalt dipped cast iron grate and frame;

6.15.7.1 (3) include a sump that is minimum 600mm below an outlet; and

6.15.7.1 (4) include a downturned elbow on drain tile inlet to sump and backwater valve, where required.

6.15.8 Manholes

The Design-Builder will provide manholes that:

6.15.8.1 (1) are constructed of reinforced precast concrete sections laid on poured-in-place reinforced concrete foundation pad with pipe formed bottom;

6.15.8.1 (2) are complete with heavy duty hot asphalt dipped cast iron manhole cover and frame; and

6.15.8.1 (3) are provided with a drain kit and ladder step rungs, where required.

6.15.9 Backflow Preventers

The Design-Builder will provide backflow preventers that comply with the AWWA standards and the COV requirements.

6.15.10 Elevator Simplex Sump Pump

The Design-Builder will provide simplex submersible sump pump complete with:

6.15.10.1 (1) cast iron pump casing and motor cover;

6.15.10.1 (2) an oil filled, overload protected, submersible, ball bearing type, single or three phase motor with a minimum of 3 metres of PVC jacketed power cord prewired to the motor;

6.15.10.1 (3) an open, two vane type, non-clog cast iron impeller secured to a stainless-steel pump and motor shaft;

6.15.10.1 (4) three switches, each sealed in a polyurethane float and complete with a minimum of 3 metres of power cord, two float switches for pump "ON-OFF" control, the other float switch for high water level alarm;

6.15.10.1 (5) a bracket to support float switch cables in the sump pit;

6.15.10.1 (6) a simplex factory prewired, and tested power and control panel complete with a NEMA 3R enclosure with hinged and gasketed padlockable door, galvanized steel back panel with power and control wiring terminal blocks, bundled and identified wiring and the following:

6.15.10.1 (6) (a) a circuit breaker, a H-O-A switch, an overload protected magnetic motor starter with test and reset pushbuttons and an identified "RUN" pilot light;

6.15.10.1 (6) (b) a fused control transformer;

6.15.10.1 (6) (c) a solid-state pump controller with LED indicator lights;

6.15.10.1 (6) (d) a high-level alarm horn with push to silence switch and automatic reset flashing red light; and

6.15.10.1 (6) (e) dry contacts for high water level alarm condition connection to the Facility DDC system.

6.15.11 Storm and Sanitary Duplex Sump Pumps

The Design-Builder will provide submersible duplex sump pumps set as per the equipment schedule, each pump complete with:

6.15.11.1 (1) a cast iron pump casing and motor cover;

6.15.11.1 (2) an oil filled, overload protected, submersible, ball bearing type, three phase motor with a minimum of 3 metres of PVC jacketed power cord prewired to the motor;

6.15.11.1 (3) an open, two vane type, non-clog impeller secured to a stainless-steel pump and motor shaft;

6.15.11.1 (4) a guide rail package complete with cast iron discharge elbow, discharge flanges for connection to pumps, steel spacer, stainless steel upper guide rail bracket and lift chain; and

6.15.11.1 (5) pump set control components supplied by the pump manufacturer are to consist of:

6.15.11.1 (5) (a) four switches, each sealed in a polyurethane float and complete with a minimum of 3 metres of control cord, three for pump set control and one for sump high water level alarm;

6.15.11.1 (5) (b) a bracket to support float switch cables in the sump pit;

6.15.11.1 (5) (c) a duplex factory prewired, and tested power and control panel complete with a NEMA 3R enclosure with hinged and gasketed padlockable door, galvanized steel back panel with power and control wiring terminal blocks, bundled and identified wiring and the following:

.1 a circuit breaker, a H-O-A switch, an overload protected magnetic motor starter with test and reset pushbuttons and an identified "RUN" pilot light for each pump and a relay alternating circuit to automatically alternate the lead pump after each successive pumping cycle;
.2 a fused control transformer;
.3 a solid-state pump controller with LED indicator lights;
.4 a high-level alarm horn with push to silence switch and automatic reset flashing red light; and
.5 dry contacts for high water level alarm condition connection to the Facility DDC system.

6.15.12 Sump Frames and Cover Plates

The Design-Builder will provide the following:

6.15.12.1 (1) for pumps where piping and cables are extended through cover:

6.15.12.1 (1) (a) welded sump curb frame and cover plate assembly constructed of hot dip galvanized mild steel, suitable in all respects for the application and location; and

6.15.12.1 (1) (b) complete with angle frame designed for flush with floor cover plate mounting with trim bar and countersunk screws, centre brace and two-piece minimum 8 mm (5/16") thick cover with lifting rings, gaskets and, in one cover, a vent pipe opening and discharge pipe opening(s) with sealing flange(s), sealed opening(s) for pump power cord(s) and mounting plate with sealed opening(s) for control cables.

6.15.12.1 (2) for blank covers with no penetrations:

6.15.12.1 (2) (a) heavy-gauge hot-dipped galvanized steel sump curb frame with concrete anchors and minimum 8 mm (5/16") thick cover plate; and

6.15.12.1 (2) (b) complete with recessed lifting ring, gaskets, reinforced as required to suit the application and loading and secured to the frame by means of countersunk non-corrosive screws.

6.16 Heating, Ventilating and Air Conditioning (Division 23)

6.16.1 Heating

6.16.1.1 (1) The Design-Builder will ensure that heating is provided by a low temperature hot water heating system operating at the maximum design heating water supply temperatures below, with a linear relationship between the two values:

6.16.1.1 (1) (a) Outside air temperature 5ºC or above = 45ºC; and

6.16.1.1 (1) (b) Outside air temperature -5ºC or above = 55ºC.

6.16.1.1 (2) The Design-Builder will ensure that space heating capacity will be sufficient to meet the required indoor design temperatures identified in the School Room Data Sheets while using the January 1% outside design temperature outlined in the VBBL with no allowance for internal heat gains;

6.16.1.1 (3) The Design-Builder will ensure that the primary source of heating to the School is an air source heat pump (ASHP). The Design-Builder will size the ASHP to meet a minimum of 33% of the peak design heating capacity or 100% of the peak design cooling demand, whichever is greater;

6.16.1.1 (4) The Design-Builder will ensure that peak load heating is provided by condensing gas fired boilers. The Design-Builder will provide a minimum of two boilers and they will be sized so that a minimum of 75% of the peak design heating capacity is available with one boiler and the ASHP out of operation. All boilers will have a minimum turndown of 5 to 1 for efficient low-load operation.

6.16.1.1 (5) The Design-Builder will install all heating circulation pumps in a duty and standby configuration so that heating can be provided during failure or maintenance of a pump. Dual-arm pumps are not acceptable as they do not provide full redundancy.

6.16.2 Chilled water system

The Design-Builder will:

6.16.2.1 (1) ensure that the ASHP provided for space heating as described in Section 6.16.1 – Heating will be a simultaneous heating and cooling type capable of providing chilled water throughout the year;

6.16.2.1 (2) chilled water will be distributed throughout the Facility; and

6.16.2.1 (3) space cooling capacity will be sufficient to meet the required indoor design temperatures outlined in the Room Data Sheets while using the July 2.5% outside design wet and dry bulb temperatures outlined in the VBBL.

6.16.3 Ventilation

The Design-Builder will:

6.16.3.1 (1) ensure that the Facility is fully mechanically ventilated and cooled as required to meet the requirements of the applicable codes and standards and the School Room Data Sheets;

6.16.3.1 (2) design the ventilation system and all components in accordance with ASHRAE Standards and Handbooks.

6.16.3.1 (3) ensure that to provide free cooling, the mechanical ventilation system is capable of providing a minimum of 8 air changes per hour of outdoor air, based on ceiling height or a nominal ceiling height of 3.6 metres, to all occupied spaces except the following areas:

6.16.3.1 (3) (a) Washrooms;

6.16.3.1 (3) (b) Storerooms;

6.16.3.1 (3) (c) Corridors and other circulation spaces;

6.16.3.1 (3) (d) Communication rooms.

6.16.3.1 (4) design the heating capacity of the mechanical ventilation system for each space for a minimum of 125% of the outdoor air requirements specified in the VBBL at the 1% January design condition;

6.16.3.1 (5) ensure all ventilation equipment is controlled through the BMS. Where local on/off control is identified in this Schedule or the School Room Data Sheets, this will be from a local switch connected to the BMS so that it can be overridden if required;

6.16.3.1 (6) ensure that air within the ventilation system does not drop below its dew point temperature, except at cooling coils;

6.16.3.1 (7) provide exhaust ventilation for equipment to meet manufacturers' recommendations and to prevent fumes and odours being transferred through the school; and

6.16.3.1 (8) locate Facility exhausts at roof level at a minimum of 15 metres away from occupied roof areas.

6.16.4 HVAC System

The HVAC system will be used in each space is defined below. Where a space is not included, the Design-Builder will provide a system which meets the requirements defined elsewhere in this Schedule. Heat recovery can be provided for any area if needed to meet code requirements or achieve LEED energy performance objectives.

Space Description	**Description**
All Classrooms Yearbook Textile Laboratory Arts Studio Music Room (Choral) Graphics Arts Studio & Photo MAC Lab	Heating and cooling Dedicated unit ventilator for each room Relief air transfer to corridor Minimum of one exterior operable window with minimum area of $1m^2$ per $20m^2$ of floor area Individual room temperature control Air temperature and CO_2 sensor in each room.
Dance Studio Drama Studio Music – Band Music – Strings Multipurpose Areas (Servery, School Commons) Library Learning Commons	Heating and cooling Dedicated air handling unit or unit ventilator for each room Individual room temperature control Air temperature and CO_2 sensor in each room.
Universal Science Lab Chemistry Lab	Heating and cooling Centralised air handling unit Ducted exhaust ventilation to maintain spaces at negative pressure with respect to adjacent corridor Air-to-air heat recovery with minimum efficiency of 70% Provide dedicated exhaust operating 24/7 for chemical storage areas Individual room temperature control Air temperature and CO_2 sensor in each room.
Applied Skills – Industrial Education	Heating and cooling Centralised air handling unit Ducted exhaust ventilation to maintain spaces at negative pressure with respect to adjacent corridor Air-to-air heat recovery with minimum efficiency of 70% Dust collection system and specialist exhaust systems
Gymnasium	Heating and cooling Dedicated air handling unit Three temperature control zones aligned with courts High level air supply and low-level exhaust

Space Description	Description
	Economiser
Washrooms	Heating only, if required spaces are located on external walls Exhaust ventilation only
Offices	Heating and cooling Unit ventilator or dedicated air handling unit Individual room control of temperature.
Communications Room	Heating and cooling Dedicated wall mounted DX split heat pump. Maximum room temperature of 25°C.
Kiln	Exhaust ventilation from galvanised steel canopies of sufficient size to effectively remove heat from the kiln. System will be designed in accordance with the ACGIH Industrial Ventilation Manual. Provide dedicated exhaust with local temperature control through the BMS. Independent exhaust fan capable of operation 24/7.
Electrical Room	Cooling Dedicated DX split cooling system Provide duty and standby cooling units for full redundancy Maximum room temperature of 30°C.
Auditorium	Dedicated air handling unit with occupancy and CO_2 control. Separate temperature control for audience chamber and stage.

The following HVAC systems are not acceptable:

6.16.4.1 (1) In-floor heating;

6.16.4.1 (2) Variable Refrigerant Flow System;

6.16.4.1 (3) Exhaust air heat recovery employing heat pump or refrigeration technologies to capture heat; except using chilled water from the air source heat pump;

6.16.4.1 (4) Slow response thermal systems;

6.16.4.1 (5) Radiant panel systems;

6.16.4.1 (6) Steam heating systems;

6.16.4.1 (7) Low volume (i.e. trickle ventilation or minimum outside air systems); and

6.16.4.1 (8) Geo-exchange fields located below the Facility.

6.16.5 HVAC System Sizing and Spare Capacity

The Design-Builder will:

6.16.5.1 (1) ensure that the maximum pressure drop for heating and chilled water piping will be 200 Pa/m. The maximum water velocity will be 1.5 m/s;

6.16.5.1 (2) size heating and chilled water pumps to provide an additional 5% flow without changes to pipe sizes to provide spare capacity for future changes and expansion;

6.16.5.1 (3) size ducts to meet room noise criteria and fan energy performance criteria with an allowance of 20% additional airflow except for final connections to terminals; and

6.16.5.1 (4) size air handling units with 20% spare capacity and with capacity of operating at that additional capacity while still meeting the specified room noise criteria.

6.16.6 Heating and Chilled Water Piping

The Design-Builder will:

6.16.6.1 (1) slope piping to permit complete drainage of the system;

6.16.6.1 (2) provide adequate expansion compensation for piping;

6.16.6.1 (3) base the location of anchors and guides, design of expansion compensation loops and selection of expansion compensation devices upon a thorough review of piping layout, and piping stress analysis;

6.16.6.1 (4) equip all high points in piping with air removal devices such as air collection chambers and air vents;

6.16.6.1 (5) provide isolation valves for all air vents;

6.16.6.1 (6) provide drains at all low points complete with hose bib, screw cap and chain;

6.16.6.1 (7) provide isolation valves, unions and bypass piping to allow for equipment isolation and removal without unduly affecting the system operation or major drain down;

6.16.6.1 (8) provide balancing valves, flow-measuring devices, temperature and pressure sensors throughout the system to facilitate system balancing;

6.16.6.1 (9) ensure that hot water supply entering vertical coils enter from the bottom and exit from the top;

6.16.6.1 (10) ensure that chilled water supply entering vertical coils enter from the top and exit from the bottom;

6.16.6.1 (11) ensure that balancing valves are positioned on the return side of a coil;

6.16.6.1 (12) ensure that control valves are positioned on the supply side of the coil;

6.16.6.1 (13) ensure all coils have isolations valves installed on the supply and return side. Balancing valves will not be used for isolation; and

6.16.6.1 (14) not use butterfly valves.

6.16.7 Dust Collector and Dust Collection System

The Design-Builder will:

6.16.7.1 (1) provide a dust collection system for the wood shop which is capable of removing dust from all equipment when in operation concurrently;

6.16.7.1 (2) provide dust collectors that comply with the BC Fire Code, WorkSafeBC requirements and all applicable codes and standards;

6.16.7.1 (3) ensure that the collection bin for the dust collector may be emptied by a single member of staff. Bins which required the use of mechanical equipment such as a forklift are not acceptable;

6.16.7.1 (4) ensure that the dust collection duct system uses a certified system which clamps together so that changes can be implemented without having to cut the ducts; and

6.16.7.1 (5) provide metal blast gates at all equipment at approximately 1200mm above floor level and conductive hose for final connections.

6.16.8 Air Source Heat Pumps (ASHPs)

The Design-Builder will:

6.16.8.1 (1) refer to the VSB Mechanical Standards;

6.16.8.1 (2) ensure that circulation pumps are separate from the ASHP and not incorporated as part of the ASHP;

6.16.8.1 (3) use propylene glycol for freeze protection of the ASHP and the associated external piping; and

6.16.8.1 (4) use plate heat exchangers to separate the glycol system from the remainder of the heating and cooling system serving the Facility.

6.16.9 Sound Attenuation and Vibration Isolation

The Design-Builder will:

6.16.9.1 (1) design all mechanical systems to prevent sound and vibration transmission between spaces, and transmission from mechanical equipment to the spaces and maintain sound to levels as per design standards;

6.16.9.1 (2) design mechanical systems to minimize sound transmission to the neighbouring residential community and in accordance with COV Noise Bylaw;

6.16.9.1 (3) provide vibration isolation devices on all equipment with rotating components;

6.16.9.1 (4) ensure that all hung equipment utilizes spring isolators designed for the weight and vibration characteristics of the equipment;

6.16.9.1 (5) provide flexible connectors on all pump, duct, and wiring connections to isolated equipment;

6.16.9.1 (6) ensure duct silencers meet or exceed the requirements of the ductwork for cleanliness and inspection; and

6.16.9.1 (7) use fibre free internal duct lining.

6.16.10 Testing, Adjusting, Balancing and Commissioning

The Design-Builder will:

6.16.10.1 (1) demonstrate to the Owner that the mechanical and electrical systems are substantially operational by testing, adjusting, balancing, and commissioning the systems in accordance with Good Industry Practice, the Commissioning Plan and the reference documents listed earlier in this Schedule;

6.16.10.1 (2) retain complete records of all TAB and commissioning data; and

6.16.10.1 (3) provide the Owner with a copy of the final documents for review.

6.17 Integrated Automation (Division 25)

6.17.1 Refer to Appendix 1H – VSB Mechanical Standards.

6.18 Electrical (Division 26)

The Design-Builder will:

6.18.1 undertake all electrical work in accordance with Appendix 1I – VSB Electrical Standards;

6.18.2 provide new electrical systems, materials, and equipment in the Facility, and of a type and quality intended for use in a permanent educational facility like the Facility;

6.18.3 ensure that all equipment and their components have a visible manufacturer's nameplate, indicating the manufacturer's name, model number, serial number, capacity, electrical characteristics and approval stamps;

6.18.4 ensure that the electrical system provides proper protection, continuity of service and a safe working environment for staff and students;

6.18.5 coordinate interface requirements with devices provided by other divisions;

6.18.6 comply with all applicable standards including:

6.18.6.1 (1) those listed in Section 2.1 – Standards of Design and Construction;

6.18.6.1 (2) COV Building By-laws;

6.18.6.1 (3) COV Energy By-laws;

6.18.6.1 (4) American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) 90.1 (2016);

6.18.6.1 (5) Canadian Electrical Code and BC Electrical Safety Branch Regulations and Bulletins;

6.18.6.1 (6) British Columbia Fire Code including the requirements of the local Owner having jurisdiction;

6.18.6.1 (7) Model National Energy Code of Canada for Buildings;

6.18.6.1 (8) NFPA Standards;

6.18.6.1 (9) CAN/ULC S524 Standard for the Installation of Fire Alarm Systems;

6.18.6.1 (10) CAN/ULC S537 Standard for the Verification of Fire Alarm Systems; and

6.18.6.1 (11) EIA/TIA 568 Telecommunication Wiring Standards (refer to Communications Division 27).

6.18.7 install every electrical system in a fixed and permanent manner;

6.18.8 ensure the system installation economically occupies available space, leaving space for future additions and be planned to facilitate easy access to other systems and equipment, including, but not limited to mechanical equipment, Facility systems access ways, and architectural Facility components which may require periodic inspection or maintenance;

6.18.9 provide record drawings and operation and maintenance manuals in accordance with the body of the Design-Build Agreement.

6.18.10 Electrical Utilities

The Design-Builder will:

6.18.10.1 (1) refer to Appendix 1I – VSB Electrical Standards;

6.18.10.1 (2) apply for, obtain and coordinate all power and communication utility services with BC Hydro, Telus, FortisBC and/or other service providers;

6.18.10.1 (3) ensure all work including installation is in accordance with the relevant utility standards and requirements;

6.18.10.1 (4) provide utility service entrance underground ducts are Type DB2, or as required by the local utility;

6.18.10.1 (5) provide drainage of ducts in accordance with utility standards.

6.18.10.1 (6) provide a BC Hydro underground service to an interior pad-mounted unit substation located in a main electrical room within the Facility. High voltage switchgear and transformer may be located outdoors.

6.18.10.1 (7) ensure that the switchgear for these incoming services will be dual rated, 12.5/25kV. Note that 12.5kV service is available at the BC Hydro pole line along W 33rd Avenue;

6.18.10.1 (8) provide separate high voltage services to both the new Facility and the Existing School. Provide a Type 832 in-ground junction box at the northeast corner of the Site c/w underground ducting from the existing BC Hydro pole located on W 33rd Avenue to the junction box, and from the junction box to both the new Facility and the Existing School. Re-route the existing underground high voltage ducting serving the Existing School to the new junction box. The existing high voltage conductors from the existing BC Hydro pole to the Existing School will be removed and replaced by BC Hydro as part of their work. The Design-Builder will be responsible for the cost of the BC Hydro work and for arranging and coordinating the work with BC Hydro as required;

6.18.10.1 (9) confirm service routing and connections to the Existing School with the Owner during the design phase;

6.18.10.1 (10) remove all existing redundant BC Hydro services serving the Site as required by BC Hydro;

6.18.10.1 (11) ensure that the capacity of the utility connections, cable and incoming medium voltage switchgear, in the initial installation, allow for the initial connected load requirements;

6.18.10.1 (12) reduce vulnerability of the utility connections by burial, concrete encasement, location marking, and other available means to guard against accidental disruption by on-site or near-site activities;

6.18.10.1 (13) ensure that the location of utility ducts will not interfere with any known future expansion of the Facility.

6.18.11 Seismic Requirements for Electrical Systems

The Design-Builder will:

6.18.11.1 (1) refer to Appendix 1I – VSB Electrical Standards;

6.18.11.1 (2) ensure that seismic restraint for all electrical equipment and components of electrical systems which are part of the Facility will be seismically restrained to prevent injury or hazards to persons and equipment and to retain equipment in a safe position;

6.18.11.1 (3) select seismic restraint systems and methods to facilitate ease of maintenance and ease of replacement and reconfiguration of electrical equipment and systems and other equipment and Facility components;

6.18.11.1 (4) select seismic restraint systems and methods to coordinate with the Facility architecture and finishes;

6.18.11.1 (5) conceal from public view, wherever practicable, components of seismic restraints, and where concealment is not practicable, design the systems to complement the Facility architecture and finishes;

6.18.11.1 (6) ensure that seismic restraints meet or exceed the requirements of the current edition of the VBBL;

6.18.11.1 (7) ensure that seismic restraint design follows the recommended practices published in the Seismic Restrain Standards Manual (AIBC) as adopted by the Electrical Contractors Association of BC and CSA S832-06 Guidelines for Seismic Risk Reduction of Operational and Functional Components;

6.18.11.1 (8) ensure that all electrical equipment and components of electrical systems that have the potential to cause injury or damage during or following a seismic event are seismically restrained; and

6.18.11.1 (9) ensure that the seismic restraint systems is designed by a professional engineer registered in British Columbia, or, where an identified pre-designed standard restraint device or system exists for a particular item, that equipment may be used provided that written confirmation of its acceptability for the installation is provided by a professional engineer registered in British Columbia.

6.18.12 Grounding and Bonding

The Design-Builder will:

6.18.12.1 (1) refer to Appendix 1I – VSB Electrical Standards;

6.18.12.1 (2) ensure that all electrical equipment and systems in the Facility is properly bonded and grounded in accordance with the most current edition of the Canadian Electrical Code, TIA Standards, and local by-laws;

6.18.12.1 (3) ensure that grounding and bonding provides for safety of personnel and for protection against damage to equipment or property in the case of a fault occurring in any of the equipment or systems;

6.18.12.1 (4) ensure that all conductors and conducting components of electrical equipment which form part of the grounding and bonding systems in the Facility are made of non-alloyed copper; and

6.18.12.1 (5) commission an approved testing agency to perform a main system ground test and report.

6.18.13 Wiring Methods and Materials

The Design-Builder will:

6.18.13.1 (1) refer to Appendix 1I – VSB Electrical Standards;

6.18.13.1 (2) use wiring methods and materials that result in safe reliable and flexible electrical power, control, communication, data, and life safety systems in the Facility;

6.18.13.1 (3) neatly and securely install all wiring in such a way that it is protected from damage, is not in conflict with mechanical or architectural components of the Facility and allows for future changes and additions;

6.18.13.1 (4) ensure wiring methods accommodate additions, removals and relocations within the Facility;

6.18.13.1 (5) ensure that all conductors and all conducting components of electrical equipment, which form part of the wiring systems in the Facility, will be of non-alloyed copper. Minimum conductor size will be #12 AWG. All conductors larger than #10 AWG will be stranded;

6.18.13.1 (6) provide Facility wire insulation that is RW90 cross-linked polyethylene (XLPE), insulated for 600V;

6.18.13.1 (7) size conductors to ensure a voltage drop of not more than 2% for feeders and 3% for branch circuits;

6.18.13.1 (8) install in conduit all feeder and branch circuit home run wiring. Type AC-90 armoured cable may be used for final connections to light fixtures (3 metre maximum length above accessible ceilings). Conduit will be run to the first receptacle or light switch outlet box in the wall. AC-90 cable may be run from this first outlet box to the next device only within the same wall. Daisy-chaining of AC-90 cables between luminaires is not permitted;

6.18.13.1 (9) conceal all wiring and wiring support systems except in service rooms, where wiring is concealed as much as practical;

6.18.13.1 (10) protect all wiring from mechanical damage throughout each wiring system and prevent entry or accumulation of moisture into any wire, cable, or wire way;

6.18.13.1 (11) separate wiring for systems of different voltages and from different sources of supply, and prevent interference between wiring of power supply systems and wiring of data and communication systems by maintaining separation and shielding throughout;

6.18.13.1 (12) ensure black boxes and junction boxes do not exceed 80% of the maximum fill allowable by CEC;

6.18.13.1 (13) clearly label all conductors and cables at both ends;

6.18.13.1 (14) identify all pull boxes, junction boxes and conduits with purpose-manufactured durable and clearly legible marking to identify the function and voltage of the system; and

6.18.13.1 (15) install and maintain all approved fire stopping at all fire separations and at any locations required by VBBL or by the local inspector.

6.18.14 Raceways

For the purpose of this Section 6.18.14, the word “raceway” will have the same meaning as defined in the Canadian Electrical Code, Section 0. The Design-Builder will:

6.18.14.1 (1) provide raceways for wiring and cabling to support, protect and organize wiring and cabling systems throughout the Facility;

6.18.14.1 (2) refer to Appendix 1I – VSB Electrical Standards.

6.18.14.1 (3) design and install raceways will be designed and installed in such a way to provide ease of access, capacity for expansion and change, and in accordance with the requirements of the equipment and systems that they serve;

6.18.14.1 (4) ensure that generally, raceways are EMT, as allowed by code. Rigid PVC conduit may be used in/below concrete slabs for underground services or to serve floor mounted devices. The use of Electrical non-metallic tubing (ENT) is not acceptable.

6.18.14.1 (5) use flexible metallic conduit for vibration isolation of equipment such as motors and transformers;

6.18.14.1 (6) use liquid tight flexible metallic conduit for mechanical equipment in damp or wet locations and for kitchen equipment connections;

6.18.14.1 (7) provide separate raceways or cable trays with appropriate barriers for cables and conductors of different voltages or system types.

6.18.14.1 (8) ensure that cable trays, in-floor tray or duct systems will have a maximum 25% fill. Wherever multiple raceways are required in a group, such as a duct bank interconnecting two or more major areas, provide matching empty raceways equal to a minimum of 50% of the total installed group. Provide pullstrings in all conduits;

6.18.14.1 (9) plan raceways to facilitate easy access to other systems and equipment, including mechanical equipment, Facility systems access ways, and architectural Facility components which may require periodic inspection or maintenance;

6.18.14.1 (10) design and install raceways without sharp edges or sharp bends so that cables can be pulled in or laid in and removed without damage to the cables. Manufacturer's maximum bend radii will be observed;

6.18.14.1 (11) ensure that all metallic raceways are continuously bonded with a bonding conductor installed within the raceway;

6.18.14.1 (12) install two 53mm conduits c/w pullstrings from the electrical room to the roof for future photo-voltaic system panels. Provide approved roof jacks or other approved roof penetration methods; and

6.18.14.1 (13) install two 53 mm conduits c/w pullstrings from the main electrical room and two 53mm conduits from the main communication room to the parking lot for future power and data cabling. Terminate power and communication conduits in separate pullboxes with metal covers in a soft landscaped area. Locations to be confirmed by Owner.

6.18.15 Uninterruptable Power Supplies

The Design-Builder will:

6.18.15.1 (1) refer to Appendix 1I – VSB Electrical Standards;

6.18.15.1 (2) provide a reliable source of uninterruptable power for all systems noted in this Schedule;

6.18.15.1 (3) ensure that uninterruptable power systems are available 100% of the time; and

6.18.15.1 (4) note that an emergency generator is not anticipated as a requirement for this Facility. The Owner does not require an emergency generator unless it is required by VBBL.

6.18.16 Uninterruptible Power Supplies (UPS)

The Design-Builder will provide uninterruptible power supplies for all equipment that requires a continuous and uninterrupted source of power. Refer to Division 27 for additional UPS requirements. The Design-Builder will comply with the following requirements:

6.18.16.1 (1) UPS units will be rack mounted, rated 1500VA minimum. Each rack will have a dedicated UPS. All UPS units will automatically transfer the load to and from the normal power supply without any interruption or disturbance of supply to the load. Refer to Division 27 for additional requirements for UPS; and

6.18.16.1 (2) areas or equipment requiring UPS power will include, but not limited to:

6.18.16.1 (2) (a) Public Address Systems;

6.18.16.1 (2) (b) Computer network equipment;

6.18.16.1 (2) (c) Telephone Systems.

6.18.17 Power Distribution and Devices

The Design-Builder will:

6.18.17.1 (1) refer to Appendix 1I – VSB Electrical Standards.

6.18.17.1 (2) provide distribution equipment and systems that are robust, reliable, easily operated and maintained, design such equipment and systems with extra capacity to accommodate load growth, equipment additions, and changes;

6.18.17.1 (3) ensure distribution equipment is of a “specification grade” and “institutional” or “industrial” quality and not of a “light duty” or “commercial” quality;

6.18.17.1 (4) provide appropriate drip shields or sprinkler proof enclosures for all electrical equipment located in areas protected by a sprinkler fire protection system;

6.18.17.1 (5) ensure all secondary power distribution equipment is from the same manufacturer;

6.18.17.1 (6) use the following acceptable manufacturers: Eaton, Schneider, Siemens;

6.18.17.1 (7) group together major electrical equipment, including high voltage distribution, transformers, main distribution centres, transfer switches, motor control centres, and power factor correction equipment, in a configuration that allows for addition or expansion of each type of equipment, logical arrangement in terms of the interconnection, operation and maintenance of the equipment;

6.18.17.1 (8) locate electrical equipment with the intention of minimizing length of feeders and branch circuits and so as to provide a clean, dry, safe, accessible installation protected from unauthorized access;

6.18.17.1 (9) ensure that the high voltage power transformer and associated high voltage equipment is dual rated 12.47/25kV. Power transformer will be dry type, ANN, 600V 3 phase, 4-wire secondary, c/w copper windings;

6.18.17.1 (10) provide main secondary circuit breaker that is Insulated Case Breaker (ICB) type c/w adjustable electronic LSIG trip settings;

6.18.17.1 (11) ensure that the main distribution centre is rated at 600 volts, 3-phase, 4-wire;

6.18.17.1 (12) provide 600 volt, 3-phase service to all sub-electrical rooms from the main distribution centre;

6.18.17.1 (13) locate floor-mounted distribution transformers in sub-electrical rooms;

6.18.17.1 (14) provide distribution transformers that are harmonic mitigating type;

6.18.17.1 (15) provide sub-distribution panels and branch panelboards that are 120/208 volt, 3-phase, 4-wire;

6.18.17.1 (16) provide mechanical distribution equipment that is rated at 600 volt, 3-phase, 3-wire and/or 120-208 volt, 3-phase, 4-wire;

6.18.17.1 (17) where magnetic motor starters are required, group together in motor control centres located in mechanical rooms;

6.18.17.1 (18) ensure motor starters are combination circuit breaker type, NEMA rated (IEC rated starters are not acceptable);

6.18.17.1 (19) ensure all lighting is 120 volts;

6.18.17.1 (20) ensure motors 0.5HP and larger will be 3-phase, 208 or 600 volts;

6.18.17.1 (21) ensure that shop equipment is served by dedicated panelboards, controlled by a contactor and key operated switch and remote red emergency “mushroom head” pushbuttons located strategically around the room;

6.18.17.1 (22) ensure that shop equipment which is served by a dust collection system is connected to a separate panelboard interlocked by a contactor with the

dust collector control panel to prevent the operation of the shop equipment until the dust collection system is running. This panelboard will also be shut down by remote mushroom head pushbuttons. General power and non-shop equipment loads will be served by a separate, non contactor-controlled panelboard. Make allowance for a local emergency stop switch and magnetic contactor for all non-portable motorized shop equipment that will be relocated to the Facility;

6.18.17.1 (23) select, configure, locate and install all components of power distribution systems to minimize the transmission of noise, vibration and unwanted heat into other parts of the Facility;

6.18.17.1 (24) design and install protection and coordination of protection equipment so that the initial electrical installation, and future additions and modifications to the installation will be properly protected and fully coordinated. In the event of a fault or overload, protective devices will act to isolate only the faulty portion of the system and areas downstream, leaving all other portions of the system fully operational. Protection equipment will protect against injury to persons and damage to property. The 600V secondary main switchgear will consist of breakers, not fuses. Generally, breakers will be used for power distribution over current devices;

6.18.17.1 (25) provide a short circuit analysis, arc flash and coordination study based on actual distribution equipment proposed for the Facility, including the unit substation, main distribution, transformers, panelboards, and feeders. Provide a copy of the completed study for review;

6.18.17.1 (26) where required by system characteristics or operational requirements, provide special shielding, isolation, grounding, bonding, harmonic filtration or other treatment to prevent interference between systems or degradation of performance of an individual system;

6.18.17.1 (27) locate distribution centres with due regard to future expansion and supply 20% extra space in distribution centres;

6.18.17.1 (28) ensure that components of the power distribution systems which are in any public, administrative or staff area are of a type which gives both long life expectancy without perceptible deterioration, good appearance, and will be designed, selected, and installed to permit easy and complete cleaning. These components include but are not limited to light switches, receptacles, wire ways, equipment grounding points, and status displays;

6.18.17.1 (29) provide single phase 120VAC grounding receptacles conforming to CEC and specifically to CSA Configuration 5-15R at each location where electrical equipment requiring a supply of power will be plug connected. Provide 20 ampere, CSA configuration 5-20R receptacles in corridors and housekeeping areas, at a maximum spacing of 15m;

6.18.17.1 (30) provide receptacles that are specification grade, style as per Appendix 1I – VSB Electrical Standards;

6.18.17.1 (31) provide all receptacles with stainless steel cover plates. Grouped receptacles will have a single cover plate covering the entire group. Receptacles will be white colour;

6.18.17.1 (32) refer to Division 27 of the Schedule and also Section 27 of Appendix 1I – VSB Electrical Standards for combination outlet requirements;

6.18.17.1 (33) provide line voltage switches that are specification grade, 120-volt, 20 amperes style as per Appendix 1I – VSB Electrical Standards. All switches will be provided with stainless steel cover plates. Grouped switches will have a single cover plate covering the entire group. Switches will be white colour;

6.18.17.1 (34) identify all switches, receptacles, panelboards, and motor starters;

6.18.17.1 (35) supply panelboards with type-written directories;

6.18.17.1 (36) permanently mark all receptacles and light switches with machine printed plastic labels identifying the circuit and panel number;

6.18.17.1 (37) provide lamicoid nameplates for all distribution equipment including switchboards, panelboards, transformers, motor control centres, disconnect switches, motor starters, and contactors;

6.18.17.1 (38) identify concrete duct banks, main service conduits for telephone and power and other spare raceways where they enter or leave the Facility with engraved stainless-steel marker plates and install marker plates on the exterior wall immediately above the point of entry; and

6.18.17.1 (39) provide Level 2 electric vehicle (EV) charging stations in accordance with Appendix 1I – VSB Electrical Standards.

6.18.18 Metering

The Design-Builder will:

6.18.18.1 (1) refer to Appendix 1I – VSB Electrical Standards;

6.18.18.1 (2) supply digital metering to provide detailed information about power quality and power consumption at key points throughout the Facility;

6.18.18.1 (3) ensure that the total electrical energy of the School and the Existing School is separately metered;

6.18.18.1 (4) ensure that the Childcare Centre is separately metered by BC Hydro under a separate billing account;

6.18.18.1 (5) ensure that metering meets the requirements of ASHRAE 90.1 2016 as a minimum requirement;

6.18.18.1 (6) ensure that the metering system is a networked system, with terminals for maintenance and plant administration, and data transfer to the Building Management System;

6.18.18.1 (7) integrate metering into the School district network;

6.18.18.1 (8) ensure that the metering system provides easy to read, locally displayed information for all distribution at primary voltage and for all distribution switchboards;

6.18.18.1 (9) ensure that historical data from the metering system network is stored and capable of recalling data for a minimum of a week;

6.18.18.1 (10) ensure that the metering system is not dependent on power from the metered circuit for its operation and is supported by a backup power source or sources, which ensure operation when the metered circuit is de-energized;

6.18.18.1 (11) provide an electrical sub-metering system that includes total Facility electrical consumption, individual lighting panelboards, mechanical loads, elevator(s), and individual power and receptacle panelboards;

6.18.18.1 (12) ensure metres have integrated Modbus RTU (RS-485) communications capability; and

6.18.18.1 (13) supply and install all metres in accordance with Division 26 and networked through a RS-485 Modbus network. Division 26 to provide interface between Modbus network to DDC system.

6.18.19 Power Quality

6.18.19.1 The Design-Builder will:

6.18.19.1 (1) (a) refer to Appendix 1I – Electrical Standards;

6.18.19.1 (1) (b) provide an overall power quality which assures suitable conditions for operation of all electrical and electronic equipment throughout the Facility;

6.18.19.1 (1) (c) include in the Facility equipment specifically designed to minimize adverse power quality conditions that could damage or impair function of any of the electrical or electronic equipment, which will be in use in the Facility. Adverse power quality conditions will be addressed include, but are not limited to voltage spikes, dips and droops, transients, harmonics, power factor and radio frequency interference; and

6.18.19.1 (1) (d) provide power factor correction to ensure overall Facility power factor does not fall below 90% lagging or leading, and that the Utility does not apply a power factor penalty. The power factor of the Facility will be reviewed on a periodic basis to prove that it does not fall below the BC Hydro threshold for penalty charges due to poor power factor, to the end of the warranty period. Power factor correction adjustments will be made as necessary during the warranty

period. An automatic power factor correction system is acceptable.

6.18.20 Lighting

The Design-Builder will:

6.18.20.1 (1) refer to Appendix 1I – VSB Electrical Standards;

6.18.20.1 (2) provide appropriate lighting that optimizes use of daylight, and is achieved through a combination of natural light and luminaires complete with controls;

6.18.20.1 (3) provide lighting that complies with all characteristics recommended by the Illuminating Engineering Society of North America;

6.18.20.1 (4) provide lighting levels in various spaces as described in Appendix 1I – VSB Electrical Standards;

6.18.20.1 (5) ensure that selection of luminaires and light sources meets the stated energy efficiency and quality and quantity requirements but will also meet the objective of providing both a comfortable working environment and an environment conducive to healing and recovery;

6.18.20.1 (6) construct luminaires in all areas that require minimal cleaning and permits practical and easy access and disassembly. All lighting components will be institutional grade;

6.18.20.1 (7) provide general interior lighting by LED light sources as described in Appendix 1I – VSB Electrical Standards. All interior and exterior luminaires will be served at 120 volts;

6.18.20.1 (8) provide service rooms with industrial luminaires c/w wireguard or similar protection;

6.18.20.1 (9) consider LED recessed downlights for supplemental lighting in public areas, staff rooms and meeting rooms;

6.18.20.1 (10) provide exterior luminaires that are vandal resistant type c/w LED light source;

6.18.20.1 (11) provide exterior lighting as per Appendix 1I – VSB Electrical Standards for parking areas, walkways, covered areas and entrances including exterior roof access points;

6.18.20.1 (12) provide emergency lighting in accordance with the latest edition of the VBBL and Appendix 1I – VSB Electrical Standards. Emergency battery units c/w integral and /or remote LED lamp heads will be provided. Emergency lighting will also be provided in student washrooms and change rooms;

6.18.20.1 (13) identify emergency lighting battery units by lamacoid nameplates. Remote lamp heads will be identified with machine printed labels identifying the battery unit serving the remote lamps.

6.18.20.1 (14) provide EXIT signs that are internally illuminated with LED lamps c/w with extruded aluminum housings and" running man" pictogram as required by VBBL; and

6.18.20.1 (15) provide a "NEXUS" emergency lighting management system manufactured by Thomas and Betts will be provided for testing, monitoring, and logging of emergency lighting system equipment and devices.

6.18.21 Lighting Control

6.18.21.1 (1) Refer to Appendix 1I – VSB Electrical Standards.

6.18.21.1 (2) Lighting controls is expected to comprise a significant part of energy management of the Facility, providing the flexibility required to adjust lighting to suit functions and activities throughout the Facility.

6.18.21.1 (3) The Design-Builder will:

6.18.21.1 (3) (a) comply with the requirements for the lighting control system as stated in Appendix 1I – VSB Electrical Standards and as required by ASHRAE 90.1 2016;

6.18.21.1 (3) (b) provide detailed design and documentation for the ESC Automation lighting control system in accordance with Appendix 1I – VSB Electrical Standards

6.18.21.1 (3) (c) where lighting controls are required, locate in areas accessible to the public and ensure that such controls are protected from unauthorized operation by use of a locked enclosure or key-operated switches; and

6.18.21.1 (3) (d) ensure that lighting controls in locations where they may be subjected to excessive moisture or to chemicals that might cause deterioration are rated specifically for the application.

6.18.22 Mechanical Equipment Connections

6.18.22.1 (1) Refer to Appendix 1I – VSB Electrical Standards.

6.18.22.1 (2) The Design-Builder will:

6.18.22.1 (2) (a) provide electrical power to all mechanical equipment as required for proper operation, protection and maintenance of the equipment;

6.18.22.1 (2) (b) ensure that materials and installation methods will result in safe, reliable and serviceable mechanical equipment and systems in the Facility;

6.18.22.1 (2) (c) ensure that cables, connectors, conduit systems, fittings and hardware used to make connection to mechanical equipment are of institutional or industrial quality, and select and install

such items to provide for a high level of reliability, durability and ease of maintenance of the equipment;

6.18.22.1 (2) (d) ensure connections made to motors and/or motor driven equipment or equipment with noticeable levels of vibration are of a type specifically designed to accommodate the vibration;

6.18.22.1 (2) (e) design and install connections to mechanical equipment to easily permit removal and replacement of the equipment and ensure such connections provide for the eventuality that equipment may be replaced in the future with upgraded and dissimilar equipment types; and

6.18.22.1 (2) (f) size motor control centres, main feeders to motor control centres, and mechanical distribution centres to accommodate the current mechanical equipment load plus 25% of that amount in additional spare capacity.

6.18.23 Mechanical Control Systems Interface

6.18.23.1 (1) Refer to Mechanical sections for details of the Building Management System.

6.18.24 Specialty Systems

6.18.24.1 (1) Refer to Appendix 1I – VSB Electrical Standards.

6.18.24.1 (2) Special electrical and communications systems are required in the Facility and form essential parts of the complete Facility.

6.18.24.1 (3) The Design-Builder will:

6.18.24.1 (3) (a) supply and install the power supply, specially conditioned power and communication conduits and other electrical operational support equipment in order to provide for all the requirements of permanent installations of these special electrical and electronic systems;

6.18.24.1 (3) (b) provide clocks in accordance with Appendix 1I – VSB Electrical Standards;

6.18.24.1 (3) (c) ensure that cables, connectors, conduit systems, fittings and hardware used to make connection to special equipment will be of institutional or industrial quality and select and install such items to provide for high levels of reliability, durability and ease of maintenance of the equipment; and

6.18.24.1 (3) (d) design and install special equipment to easily permit removal and replacement of the equipment and ensure that such special equipment provide for the eventuality that equipment may be replaced in the future with upgraded and dissimilar equipment types.

6.19 Communications (Division 27)

6.19.1 General

6.19.1.1 (1) All work will be in accordance with Appendix 1I – VSB Electrical Standards.

6.19.1.1 (2) The Design-Builder will comply with current versions of all TIA/EIA standards.

6.19.2 Structured Cabling

The Design-Builder will:

6.19.2.1 (1) refer to Appendix 1F – System Scope Responsibility Matrix and Appendix 1I – VSB Electrical Standards;

6.19.2.1 (2) ensure that the cabling infrastructure is designed by a Registered Communications Distribution Designer (RCDD) and to TIA/EIA standards;

6.19.2.1 (3) coordinate all communication utility (fibre and copper) services with Telus, and/or other service providers;

6.19.2.1 (4) provide four 103mmC rigid polyvinyl chloride (RPVC) (c/w drainage) from the service providers manhole (specific manhole will be coordinated with service provider and Design-Builder) to the main telecommunication room with pull-strings;

6.19.2.1 (5) ensure that there is wall and floor space and that all requirements of the service providers are met for the terminating and entrance of incoming fibre and copper cables;

6.19.2.1 (6) provide complete system certified (25-year warranty) CommScope category 6 cabling infrastructure throughout the Facility to permit access to the School data network, and ensure that all system components are of the same product line;

6.19.2.1 (7) ensure that all cables terminate in telecommunication rooms. Maximum cable distance from end-device outlet to telecommunication room patch panel termination will be 80 metres;

6.19.2.1 (8) ensure that Telecommunication rooms will only serve the floor they are on, with the exception of cabling for public address (PA) and audio speakers, and will be placed to maximize the area they serve. Telecommunication rooms will be fed by normal power;

6.19.2.1 (9) ensure that the conduits, pathways, room layouts, and design will comply with the TIA/EIA-569-D Commercial Building Standard for Telecommunications Pathway and Spaces, current edition;

6.19.2.1 (10) ensure the cabling design and installation complies with the TIA/EIA– 568-D, D.1, D.2 and D.3 Commercial Building Cabling Standards and Optical Fibre Cabling Standards;

6.19.2.1 (11) testing the fibre optic cable in accordance with TIA/EIA 526-7-98, and TIA/EIA 526-14-A-98 standards for Optical Power Loss measurement of single mode and multimode fibre cable plant;

6.19.2.1 (12) ensure that the management and administration of the cabling plant in carried out in accordance with the TIA/EIA 606-C standard – the Administration Standard for the Telecommunications Infrastructure of Commercial Buildings;

6.19.2.1 (13) use high density CAT6 RJ45 rack mounted patch panels for all horizontal copper cable terminations in the telecommunication rooms;

6.19.2.1 (14) use a star wired cabling approach to wire all outlet locations back to telecommunication rooms and all telecommunication rooms back to the main telecommunications room;

6.19.2.1 (15) ensure that all rooms that have or are anticipated to have data, phone, video, or other end-use devices have cable system drops run back to telecommunication rooms to support those systems;

6.19.2.1 (16) ensure that all structured cabling is run in cable tray or conduit. J-hooks will be permitted from nearest cable tray or conduit to outlet box conduit stub ups where the ceiling space is accessible. J-hook use will be minimized whenever possible. J-hooks are not to be attached to ceiling support wire and will have a maximum support spacing of 500mm;

6.19.2.1 (17) ensure specialized systems requiring multiple drops have sufficient Data Drops at each location to ensure system operation;

6.19.2.1 (18) ensure that at minimum, all enclosures and racks have spare capacity for a 20% expansion;

6.19.2.1 (19) install labels as per Appendix 1I – VSB Electrical Standards and place labels at minimum on the wall plate of the jack(s), inside the outlet box, at each end of cable affixed to the jacket and at the patch panel; and

6.19.2.1 (20) ensure all horizontal cables terminate on RJ45 jacks and use TIA/EIA T568A Pin configuration. Horizontal cabling is not permitted to terminate on insulation displacement contact (IDC) block.

6.19.3 Patch Cords

6.19.3.1 (1) Patch cords will be procured and installed by Owner.

6.19.4 Data Drops

6.19.4.1 (1) Data Drop quantities identified in the Appendix 1B – School Room Data Sheets do not include Data Drops for WAP's.

6.19.4.1 (2) The Design-Builder will:

6.19.4.1 (2) (a) not cluster Data Drops at a single point in a room. Regardless of the quantity of outlets, ensure the design provides the widest and most flexible coverage of the room;

6.19.4.1 (2) (b) coordinate exact Data Drop location for rooms other than teaching spaces which are specified in the School Room Data Sheets to include a Data Drop for a telephone;

6.19.4.1 (2) (c) provide a typical 4-gang combination outlet box (see Appendix 1I – VSB Electrical Standards) with two Data Drops coordinated with the Owner at the following locations:

.1 for every computer or computer workstation or for every pair of computers when located adjacent to each other;
.2 at each of two (2) teaching walls in each teaching space. Exact location will be confirmed with the Owner prior to rough-in; and
.3 in each server room within a classroom or teaching space.

6.19.4.1 (2) (d) provide a typical 3-gang combination outlet box (see Appendix 1I – VSB Electrical Standards) with two Data Drops coordinated with the Owner including at the following locations:

.1 display monitors located at the School main entrance, main entrance to the gym, and in the School Commons areas;
.2 printers, 3D printers, and CNC machines.
.3 for each flat screen (LCD TV);
.4 DDC panels and mechanical equipment requiring network connections;
.5 for two walls in each office space other than the wall that contains the 4-gang combination outlet for the workstation; and
.6 at each location where a network device is to be located.

6.19.5 Entrance Facility (Telecommunication Spaces)

The Design-Builder:

6.19.5.1 (1) will provide an entrance facility room in the Facility for incoming telecommunications service cables;

6.19.5.1 (2) may install the entrance facility equipment in the main telecommunication room. In this case, the Design-Builder will install the demarcation equipment within a wall mounted lockable enclosure, and provide a separate UPS and by-pass to power any active demarcation equipment;

6.19.5.1 (3) provide and size at minimum for 25--pair CAT5e for surge protection, Facility entrance terminals;

6.19.5.1 (4) ensure that a minimum of four (4) 103mm service ducts enter the room from the utility. Ensure that a minimum of three (3) 103mm riser or riser sleeve conduits runs between the main telecommunication room and local telecommunications rooms;

6.19.5.1 (5) provide service loops for storage of excess incoming fibre and communications cabling;

6.19.5.1 (6) ensure that the entrance facility accommodates demarcation equipment, terminations and enclosures for, but not limited to;

6.19.5.1 (6) (a) telephony;

6.19.5.1 (6) (b) fiber;

6.19.5.1 (6) (c) CATV (COAX); and

6.19.5.1 (6) (d) utility supplier and Owner-supplied equipment required for a fully functioning system; and

6.19.5.1 (7) design the entrance facility in accordance with the TIA/EIA-569-B Standard.

6.19.6 Main Telecommunications Room

The Design-Builder will:

6.19.6.1 (1) provide a main telecommunications room that includes:

6.19.6.1 (1) (a) core network routers;

6.19.6.1 (1) (b) core network switches; and

6.19.6.1 (1) (c) core devices connected to every local telecommunications room by fibre backbone.

6.19.6.1 (2) ensure that backbone fibre and horizontal copper cabling to the room terminates in rack mounted patch panels;

6.19.6.1 (3) provide the Main Telecommunications Room with a minimum three data racks of the type specified in Appendix 1I – VSB Electrical Standards;

6.19.6.1 (4) at minimum, the room will be sized to accommodate the quantity of racks required for cabling terminations, telecommunication equipment and servers plus 20% spare capacity;

6.19.6.1 (5) determine the clearance for racks by the equipment or rack component (I.e. vertical cable manager) that is closest to the wall or wall mounted equipment that the clearance is measured from;

6.19.6.1 (6) provide 1 meter clearance between wall mounted equipment to the front, back and one side of racks or rows of racks;

6.19.6.1 (7) provide one additional empty rack for future Owner use. This rack will not form part of the future expansion space to be provided;

6.19.6.1 (8) ensure that the main telecommunications room accommodates as a minimum:

6.19.6.1 (8) (a) core network switches;

6.19.6.1 (8) (b) edge switches;

6.19.6.1 (8) (c) servers;

6.19.6.1 (8) (d) Uninterrupted Power Supplies (UPS);

6.19.6.1 (8) (e) firewalls;

6.19.6.1 (8) (f) edge routers;

6.19.6.1 (8) (g) core routers;

6.19.6.1 (8) (h) main PA/Audio rack assembly;

6.19.6.1 (8) (i) Owner supplied equipment; and

6.19.6.1 (8) (j) PBX.

6.19.7 Local Telecommunications Rooms

The Design-Builder will:

6.19.7.1 (1) provide a minimum of one local telecommunications room per floor. Additional local telecommunications room may be required on floors where the single local telecommunications room does not conform to the 80-meter horizontal cabling limitation. The main telecommunications room is considered the local telecommunications room for its floor;

6.19.7.1 (2) note that “Local Telecommunications Room” and “Auxiliary Telecom Room” is used interchangeably in the Agreement;

6.19.7.1 (3) vertically stack above the main telecommunications room the local telecommunications rooms. Additional local telecommunications rooms on a floor will be stacked vertically in their respective areas;

6.19.7.1 (4) provide a minimum of one floor standing 2-post telecom rack type Middle Atlantic RLA19-1245B c/w vertical cable managers in local telecommunications rooms;

6.19.7.1 (5) ensure that backbone fibre and horizontal copper cabling to the room terminates in rack mounted patch panel. The room will be sized by the quantity of racks required for cabling terminations, telecommunication equipment and servers plus 20% spare capacity;

6.19.7.1 (6) determine the clearance for racks by the equipment or rack component (I.e. vertical cable managers) that is closest to the wall or wall mounted equipment that the clearance is measured from;

6.19.7.1 (7) provide 1 meter clearance between wall mounted equipment and front, back and one side of racks or rack rows;

6.19.7.1 (8) provide one empty rack in each local telecommunications room for future Owner use. This rack will not form part of the future expansion space to be provided; and

6.19.7.1 (9) ensure that the local telecommunications room accommodates, but is not limited to the following;

6.19.7.1 (9) (a) access switches;

6.19.7.1 (9) (b) UPS; and

6.19.7.1 (9) (c) Owner-supplied equipment.

6.19.8 Pathways

6.19.8.1 (1) Cable trays will be used for telecommunications and public address cabling throughout the Facility and inside telecommunications rooms. A zone conduit system may be used in areas where cable trays are not feasible.

6.19.8.1 (2) The Design-Builder will:

6.19.8.1 (2) (a) provide one 53mmC DB2 conduit from the main telecommunications room to the emergency supplies building;

6.19.8.1 (2) (b) provide a cable tray in public areas where enclosed accessible ceiling spaces exist;

6.19.8.1 (2) (c) provide conduit pathways with maximum 30% fill and ensure cable trays have maximum 25% fill;

6.19.8.1 (2) (d) provide cable trays in private areas (i.e. service corridors and service rooms) where a ceiling exists or does not exist;

6.19.8.1 (2) (e) use a cable tray barrier to separate telecommunications cabling from public address cabling and speaker cabling;

6.19.8.1 (2) (f) install a cable tray 150mm from any wall and ensure that at minimum one side has 1000mm clearance along the entire length of the cable tray run;

6.19.8.1 (2) (g) ensure each telecommunications room has wire mesh cable tray installed around the circumference of the room as well as over top of any racks in a “figure 8” pattern;

6.19.8.1 (2) (h) use drop-outs (waterfalls) will be used when cable transitions in and out of cable tray.

6.19.8.1 (2) (i) ensure that all conduits used for telecommunications cabling have bushings and that the cabling is protected from sharp edges or other potential sources that could damage to the cabling;

6.19.8.1 (2) (j) ensure that the grounding of conduit pathways and components meets TIA/EIA-607-C Standard – Commercial Building Grounding and Bonding Requirements for Telecommunication;

6.19.8.1 (2) (k) provide Hilti Speed Sleeves or acceptable equivalent where cable tray or communications cabling is required to penetrate a firewall or slab. Hilti Speed Sleeve or acceptable equivalent capacity will match the cable tray it serves as to not create a bottle neck; and

6.19.8.1 (2) (l) ensure each telecommunications room has a ground bus bar and bonding as per TIA/EIA-607-C.

6.19.9 Racks

6.19.9.1 (1) Refer to Appendix 1I – VSB Electrical Standards.

6.19.9.1 (2) The Design-Builder will:

6.19.9.1 (2) (a) supply a 12u wall mounted cabinet in each server room located in a classroom or teaching space. This cabinet requires one (1) 120V, 20A receptacle and will be bonded to the telecommunications main grounding busbar;

6.19.9.1 (2) (b) provide a dedicated 120V, 15A circuit and L5-15P twist lock receptacle for each rack UPS and locate on the cable tray directly above the rack;

6.19.9.1 (2) (c) provide a dedicated 120V, 20A circuit and L5-20P twist lock receptacle for each rack and located on the cable tray directly above the rack;

6.19.9.1 (2) (d) ensure each rack has a Chatsworth 12848-708 or acceptable equivalent vertical mount surge-protected power strip;

6.19.9.1 (2) (e) ensure all racks are only filled in the top 2/3 of the rack. The bottom 1/3 of the rack will be used for the UPS system only and will not contribution to the future expansion space; and

6.19.9.1 (2) (f) ensure that racks have a bonding lug.

6.19.10 Cable Management

6.19.10.1 (1) For vertical cable management, the Design-Builder will:

6.19.10.1 (1) (a) use hinged channels for vertical cable management and provide on relay frames and racks on either side from top to bottom (no horizontal cables will be installed in the channel.) Where relay racks are installed adjacent to each other, provide a minimum 125mm wide by 150mm deep hinged trough in between racks; and

6.19.10.1 (2) provide horizontal cable management as per Appendix 1I – VSB Electrical Standards.

6.19.11 Uninterrupted Power Supply for Communications Equipment

The Design-Builder will:

6.19.11.1 (1) provide an audio and public address system with UPS c/w bypass sized as to allow complete system functionality and usage for a minimum of 30min in the event of a power failure. The UPS will be of the Eaton type or acceptable equivalent; and

6.19.11.1 (2) ensure that the UPS for core switches and servers has network connection to local server and is configured to notify the Owner via email of power failure and initiate a graceful shutdown when there is five (5) minutes of battery remaining.

6.19.12 Wireless Infrastructure

The Design-Builder will:

6.19.12.1 (1) refer to Appendix 1F – System Scope Responsibility Matrix and the Appendix 1I – VSB Electrical Standards;

6.19.12.1 (2) provide the Facility with a digital wireless network infrastructure that allow wireless end-use devices access to the network and all its associated applications;

6.19.12.1 (3) provide a complete wireless network infrastructure throughout the Facility with no dead spots allowing any standard network applications or telephone applications to be utilized with no interruptions;

6.19.12.1 (4) provide 3 metres of slack on the CAT6 cables serving WAP's where it is possible to neatly coil and conceal the cables (i.e. drop ceilings);

6.19.12.1 (5) ensure that the structured cabling system connects the wireless access points to the local telecommunications rooms;

6.19.12.1 (6) ensure that each classroom or teaching space has at minimum two CAT6 drops for a wireless access point;

6.19.12.1 (7) provide at minimum two CAT6 drops for every $100m^2$ in floor space on each level of the Facility for wireless access points; and

6.19.12.1 (8) provide two Data Drops for wireless access points in rooms that contain mechanical equipment, boilers, electrical equipment, telecommunications equipment or DDC panels.

6.19.13 Telephones

The Design-Builder will:

6.19.13.1 (1) refer to Appendix 1F – System Scope Responsibility Matrix and Appendix 1I – VSB Electrical Standards;

6.19.13.1 (2) provide telephone systems powered via UPS power and capable of powering the complete Voice over Internet Protocol (VoIP) and analog telephone and paging system for a minimum of 30 minutes;

6.19.13.1 (3) provide all telephone system infrastructure required for a complete and fully-functioning system;

6.19.13.1 (4) integrate the public address system with Owner supplied VoIP telephone system. Design-Builder to coordinate with the Owner during the design and provide all public address system components required for fully integrated and functional system;

6.19.13.1 (5) provide spacing in the Main Telecommunications Room for Owner-supplied PBX equipment;

6.19.13.1 (6) for UPS sizing, the Design-Builder will allow 8W for each VoIP PoE phone;

6.19.13.1 (7) The Design-Builder will ensure that the proposed VoIP phone system is compatible with the Owners' preferred VoIP phones (OSOI);

6.19.13.1 (7) (a) Classrooms: Polycom VVx 201 series; and

6.19.13.1 (7) (b) Administrators' offices: Polycom VVx 310 series.

6.19.14 Public Address (PA) / Audio System

6.19.14.1 (1) The Design-Builder will:

6.19.14.1 (1) (a) refer to Appendix 1F – System Scope Responsibility Matrix Appendix 1I – VSB Electrical Standards and Appendix 1J – Auditorium Specifications (note that all reference to "Audio System Contractor" in Appendix 1I VSB Electrical Standards refers to the Design-Builder);

6.19.14.1 (1) (b) provide and install conduit, outlet boxes, wiring, equipment, testing and commissioning for complete and operating performance of public address and audio system;

6.19.14.1 (1) (c) provide complete PA speaker coverage throughout the Facility so that pages can be heard and understood everywhere in the Facility, parking areas and outdoor spaces adjacent to the Facility;

6.19.14.1 (1) (d) zone PA speakers in the gym areas to allow distribution of sound from different type 2 audio input stations in each space separated by the partition. All type 2 audio input stations in the gym will also be capable of broadcasting input signals to the entire gym;

6.19.14.1 (1) (e) provide each individual office a PA speaker;

6.19.14.1 (1) (f) provide EASE software report showing compliance to the requirements in this Section prior to rough-in;

6.19.14.1 (1) (g) note that all references to sound levels in dB SPL are measured at 1.5m above finished floor;

6.19.14.1 (1) (h) determine all audio and PA speaker quantities by the sound requirement in dB SPL as per this Section;

6.19.14.1 (1) (i) in addition to all other locations, provide four type 2 audio input stations in consultation with the Owner in:

.1 each Music Room;
.2 Dance Studio;
.3 Drama Studio; and
.4 Health and Fitness Studio;

6.19.14.1 (1) (j) in addition to all other zoning requirements, provide separate zones for each of four exterior sides of the Facility;

6.19.14.1 (1) (k) provide one of four Type 2 audio input station in the Drama Studio in the sound booth;

6.19.14.1 (1) (l) locate a minimum of four speakers in each Music Room, Dance Studio, Drama Studio and Health and Fitness Studio. The speakers will be Community V2-8 or acceptable equivalent; and

6.19.14.1 (1) (m) provide a Type 3-gang combination outlet c/w 2 Data Drops adjacent to each type 1 or type 2 audio input station.

6.19.14.1 (1) (n) provide a PA system and Auditorium sound system with high intelligibility and low loss of articulation of consonants, max 5% ALCONS;

6.19.14.1 (1) (o) ensure normal paging level is 60dB SPL minimum and is 10dB SPL above any ambient noise within the space it serves;

6.19.14.1 (1) (p) ensure that the Drama Studio, Dance Studio, Music rooms, Health and Fitness Studio, Gymnasium and Auditorium speakers are capable of 85dB SPL;

6.19.14.1 (1) (q) rate for outdoor use PA speakers mounted on the exterior wall of the Facility;

6.19.14.1 (1) (r) size speaker cables to provide the necessary power to the speakers it feeds as to maintain the required sound level dB SPL in the space it serves;

6.19.14.1 (1) (s) verify that a test signal using continuous sine wave sweeps and pink noise at 85 dB SPL will produce no hums, buzzes or distortion of any kind from any speakers or physical structures around the speaker or in the room;

6.19.14.1 (1) (t) provide all necessary contacts, relays and other equipment required to mute the sound system in the Auditorium in the event of an emergency page and/or the fire alarm system is in alarm mode; and

6.19.14.1 (1) (u) provide all necessary contacts, relays and other equipment necessary to mute all inputs to the PA/Audio system via Type 1, Type 2 input stations, or centralized inputs (i.e. laptops, ipods, CD players, local microphones, and other audio input devices.) during emergency pages and/or the fire alarm system is in alarm mode.

6.19.14.1 (2) Separate PoE switches and amplifiers are permitted to be located outside of the main telecommunications room and inside another telecommunications room when the 80m distance rule cannot be met from the main telecommunications room. The Design-Builder will provide and integrate all audio system components with the main audio rack.

6.19.15 Time Systems

6.19.15.1 (1) Refer to Appendix 1F – System Scope Responsibility Matrix and Appendix 1I – VSB Electrical Standards.

6.19.15.1 (2) The Design-Builder will provide additional clock locations as identified in the School Room Data Sheets.

6.19.16 Projectors and AV

6.19.16.1 (1) Refer to Appendix 1F – System Scope Responsibility Matrix and Appendix 1I – VSB Electrical Standards.

6.19.16.1 (2) The Design-Builder will:

6.19.16.1 (2) (a) provide and install conduit, outlet boxes, wiring, testing and commissioning for complete and operating performance of the infrastructure for the projectors;

6.19.16.1 (2) (b) determine final projector types and locations as per the School Room Data Sheets and in consultation with the Owner;

6.19.16.1 (2) (c) determine viewing angles as per Audio and Integrated Experience Association (AVIXA) V202.01:2016 standard;

6.19.16.1 (2) (d) ensure a 3-gang combination outlet with Two (2) Data Drops will be provided at the base of each projector support.

6.19.16.1 (2) (e) ensure all conduits for AV cabling will be concealed within walls and ceiling spaces and will not be visible.

6.19.16.1 (2) (f) ensure speaker cabling will not share the same conduit as HDMI, USB or network cabling.

6.19.16.1 (2) (g) ensure audio-visual outlets that will be used by staff to connect their end-user devices will be placed in a logical location near the teacher's desk where applicable and in a location that minimizes any potential tripping hazard.

6.19.16.1 (2) (h) ensure all wall mounted flat screen monitors will be securely encased with a vandal resistant tamper proof Lexan protective cover designed to allow air flow for device cooling. Mounting height of flat screen monitors will be determined by the Owner.

6.19.16.1 (2) (i) ensure plywood backing required for the mounting of the projectors will be at minimum 1830mm wide and 620mm high. Plywood backing will be installed in all rooms identified to have projectors in Appendix 1B – -School Room Data Sheets, even if no projector is to be installed at the time of construction.

6.19.16.1 (2) (j) ensure AV cabling that will be run in plenum spaces will be rated in compliance with local codes and by-laws for use in those spaces.

6.19.16.1 (3) For classrooms, teaching spaces and areas not identified in Section 6.19.16.1(4), the Design-Builder will:

6.19.16.1 (3) (a) ensure that the AV cabling is directly connected to each projector to a recessed wall mounted junction box. The AV cabling will include an HDMI cable (Kramer AV CP-HM/HM/ETH or acceptable equivalent) and a USB 3.0 cable. The wall mounted recessed junction box will include termination straps that include female terminations for both cables;

6.19.16.1 (3) (b) ensure the pathways for projector AV cabling will be run in an EMT conduit from an AV junction box sized 300mm X 300mm x 150mm mounted to the structural ceiling near the base of the projector. The AV cabling will then run in a 53mm conduit that will connect the ceiling mounted AV junction box to a recessed wall mounted 2-gang junction box (min. 100mm deep) c/w mud ring and centered at 300mm above finished floor as per 6.23.12.1(10); and

6.19.16.1 (3) (c) provide two 27mm EMT conduits and pull strings inside the wall that will display the projector image for future speakers. One end of the conduits will terminate in the ceiling mounted AV junction box and the other ends of the EMT conduits will be capped and stub inside the wall on either side of the projector image 150mm below finished ceiling.

6.19.16.1 (4) For Gymnasiums, Drama Studio and School Commons, the Design-Builder will:

6.19.16.1 (4) (a) ensure that AV cabling is directly connected to each projector to a recessed wall mounted junction box. The AV cabling will include an HDMI cable (Kramer AV CP-HM/HM/ETH or acceptable equivalent) and/or CAT6.The wall mounted recessed junction box will include a termination strap that

includes a female termination. The Design-Builder will utilize a HDBaseT system; and

6.19.16.1 (4) (b) ensure the pathways for projector AV cabling will be run in an EMT conduit from an AV junction box sized 150mm X 150mm x 150mm mounted to the structural ceiling near the base of the projector. The AV cabling will then run in a 53mm conduit that will connect the ceiling mounted AV junction box to a recessed wall mounted 1-gang junction box (min. 100mm deep) c/w mud ring and located near the type two input station for that space if applicable (final location to be coordinated with owner prior to rough-in); and

6.19.16.1 (4) (c) ensure the projectors are mechanically protected with a perforated metal cage.

6.20 Electronic Safety and Security (Division 28)

6.20.1 Fire Alarm

The Design-Builder will:

6.20.1.1 (1) design and install the fire alarm system to meet the latest applicable versions of the following standards:

6.20.1.1 (1) (a) Can / ULC S524 Standard for installation of Fire Alarm Systems;

6.20.1.1 (1) (b) Can / ULC S537 Standard for Verification of Fire Alarm Systems;

6.20.1.1 (1) (c) Elevator Code CAN/CSA-B44; and

6.20.1.1 (1) (d) Appendix 1I – VSB Electrical Standards;

6.20.1.1 (2) provide a fully addressable, single stage computer-based fire alarm system throughout the Facility in accordance with the VBBL and all applicable codes and standards;

6.20.1.1 (3) ensure the main addressable control panel will be a minimum Notifier NFS2-3030 series (no alternate);

6.20.1.1 (4) provide manual stations that are Edwards 270-SPO (no alternate) in accordance with the Owner's requirements;

6.20.1.1 (5) provide all requirements for an auto-dialler as required by the Owner and the designated monitoring company;

6.20.1.1 (6) ensure bells are in accordance with School district standards;

6.20.1.1 (7) provide fire alarm strobe lights in all locations noted in Appendix 1I – VSB Electrical Standards; and

6.20.1.1 (8) provide a remote graphic annunciator that includes an LCD display with controls.

6.20.2 Intrusion Detection

The Design-Builder will:

6.20.2.1 (1) refer to Appendix 1F – System Scope Responsibility Matrix and Appendix 1I – VSB Electrical Standards;

6.20.2.1 (2) install intrusion detection systems in all areas where protection of physical assets is critical;

6.20.2.1 (3) design the intrusion detection system in consultation with the Owner;

6.20.2.1 (4) be responsible for a complete and fully functional intrusion alarm system infrastructure including conduit, supports, junction and pull boxes, wiring, pull-strings, and rough-ins;

6.20.2.1 (5) provide an intrusion detection system that utilizes Passive Infrared Detectors (PIR) to monitor activity. PIR's will be wall mounted on 100mm x 100mm outlet box c/w single gang mud ring. PIR's will be provided and installed by the Owner and wiring and pathways will be provided by the Design-Builder. PIR's will be installed in all ground floor perimeter rooms and hallways in addition to any other location requirements;

6.20.2.1 (6) ensure that the intrusion detection system is armed and disarmed by keypads. Keypad quantities and locations will be determined in consultation with the Owner. Provide one (1) keypad next to alarm panel;

6.20.2.1 (7) provide and install the alarm panel adjacent to the fire alarm panel in the electrical room;

6.20.2.1 (8) ensure all field device wiring home run in EMT conduit to a splitter box (600mm x 150mm x 100mm) located above the alarm panel enclosure. Daisy chains are not permitted. Interconnecting conduits will be provided between the splitter and alarm panel enclosure. All wiring will be minimum 18 AWG, 4-conductor LVT. Red LVT is not permitted;

6.20.3 Panic/Duress System

6.20.3.1 (1) The Design-Builder will provide panic/duress push-button stations in the life skills washroom and shower.

6.20.3.1 (2) The Design-Builder will mount panic/duress push-button stations at both 300mm and 1200mm A.F.F. in each room; and

6.20.3.1 (3) The Design-Builder will locate siren-strobes on the outside of the door to each room and activate when the buttons are pushed.

6.21 Earthwork (Division 31)

6.21.1 Clearing and Grubbing

The Design-Builder will:

6.21.1.1 (1) undertake clearing, which consists of cutting off trees, shrubs, and vegetative growth to not more than a specified height above ground and disposing of felled trees, shrubs, and vegetative growth, including all underbrush, deadwood and surface debris;

6.21.1.1 (2) undertake grubbing, which consists of excavation and disposal of stumps and roots to not less than a specified depth below existing ground surface;

6.21.1.1 (3) prevent damage to existing fencing, trees, landscaping, natural features, benchmarks, buildings, structures, curbs, pavements, underground and overhead utilities and other site appurtenances to remain. Make good all damage;

6.21.1.1 (4) provide temporary erosion and sediment control measures to prevent soil erosion and discharge of soil- bearing runoff or airborne dust to adjacent properties, buildings and drainage systems;

6.21.1.1 (5) clear trees, shrubs, uprooted stumps, and other vegetative growth not designated to remain;

6.21.1.1 (6) cut off trees, shrubs, and other vegetation at no more than 300mm above existing ground;

6.21.1.1 (7) grub out stumps and roots to not less than 600mm below ground surface;

6.21.1.1 (8) remove cleared and grubbed materials off-site to an approved disposal area; and

6.21.1.1 (9) leave ground surface in condition suitable for immediate grading operations or stripping of topsoil.

6.21.2 Soil Stripping and Stockpiling of Topsoil

6.21.2.1 (1) Topsoil will be defined as the existing “A” horizon containing accumulated organic matter and can be distinguished by a darker colouration.

6.21.2.1 (2) The Design-Builder will:

6.21.2.1 (2) (a) determine suitability of soil for stockpiling when excavation for the Facility begin;

6.21.2.1 (2) (b) strip topsoil to its full depth, taking care not to mix topsoil with subsoil;

6.21.2.1 (2) (c) ensure that topsoil material for re-use is stockpiled on-site at locations that does not hinder Site usage or construction activities and kept separate and protected from contamination during construction. Soils containing topsoil, fill, large roots, stumps or organic debris are not suitable for use as fill;

6.21.2.1 (2) (d) remove cleared and grubbed materials off-site to disposal area.

6.21.2.1 (2) (e) not commence tripping and stockpiling of topsoil until after areas of construction have been cleared of trees, shrubs, and other vegetative growth;

6.21.2.1 (2) (f) not move or work topsoil while in a wet or frozen condition on in any manner in which the soil structure is adversely affected;

6.21.2.1 (2) (g) sample and analyse by an independent testing lab engaged by the Design-Builder stockpiled native topsoil to determine fertility and need for amendments;

6.21.2.1 (2) (h) remove from the Site to an approved disposal area any topsoil deemed unsuitable for amendment and re-use, or excess to Facility requirements;

6.21.2.1 (2) (i) ensure that all soils used for landscaping, planter boxes, gardens or toppings to sod areas:

.1 do not include any compost derived from a municipal collection programs that includes residential household organic material; and

.2 are trommel screened with a screen size of X25 mm or smaller.

6.21.3 Site Grading

The Design-Builder will:

6.21.3.1 (1) in Site grading, carefully consider existing and proposed Facility elevations and Site features to provide for efficient integration with the change in elevations across the Site and maintain connectivity to the Existing School and surrounding streets;

6.21.3.1 (2) design site grading to meet accessibility/barrier-free standards;

6.21.3.1 (3) undertake site grading, which will consist of excavation, filling and grading as required to achieve the Facility design levels, grades and contours allowing for supporting structures and surface treatments as specified;

6.21.3.1 (4) perform rough grading to the following minimum levels below design finish grade:

6.21.3.1 (4) (a) tree pits: 900mm;

6.21.3.1 (4) (b) shrub beds: 450mm;

6.21.3.1 (4) (c) ground cover areas: 300mm;

6.21.3.1 (4) (d) sodded lawn areas: 300mm;

6.21.3.1 (4) (e) seeded lawn areas: 150mm;

6.21.3.1 (4) (f) asphalt paved traffic areas: 450mm;

6.21.3.1 (4) (g) concrete walkways: 200mm; and

6.21.3.1 (4) (h) unit paver surfaces: 235mm.

6.21.3.1 (5) ensure that grades slope away from Facilitys at a minimum of 1:50 (2%).

6.21.3.1 (6) ensure that sub-grade fill under roads, parking and hard landscaping areas are approved native or imported granular material as acceptable to the Design-Builder's geotechnical consultant and capable of being compacted to the specified compaction requirements;

6.21.3.1 (7) place fill in lifts not exceeding 300 mm and compacted with a sheepsfoot roller to not less than 98% of the materials Standard Proctor Density (SPD);

6.21.3.1 (8) manage site grading to minimize retaining requirements where possible or allow retaining walls to be stepped. All designed retaining walls are to be a maximum of 1.2 metres high above adjacent grade. Modular concrete block retaining walls or timber retaining walls are not acceptable;

6.21.3.1 (9) ensure no soft landscape slopes (turf or planting areas) exceed a 3:1 horizontal to vertical cross slope for maintenance reasons. Slopes less than 1% soft landscaping are not acceptable;

6.21.3.1 (10) provide an evenly graded transition from new site and landscape to existing landscape and Site conditions;

6.21.3.1 (11) ensure that grassed areas are sodded. Site design will include responsible management of onsite storm runoff by means of slopes, swales, ditches and or fixed surface collection elements such as catch basins and/or area drains. All fixed elements will ultimately lead to approved municipal connection point/outfall location;

6.21.3.1 (12) design parking and other paved areas to minimize negative impacts on surface runoff volume and quality; and

6.21.3.1 (13) minimize reliance on underground storm water collection systems and use sustainable systems.

6.22 Exterior Improvements (Division 32)

6.22.1 Aggregate Sub-Base and Base Courses

The Design-Builder will:

6.22.1.1 (1) utilize granular sub-base and base materials for support and stability of surface treatments under applicable loadings and through freeze thaw cycles typical to the regional area;

6.22.1.1 (2) provide granular sub-base and/or base material support to surface treatments requiring granular sub-base and/or base material support include, but are not necessarily limited to:

6.22.1.1 (2) (a) asphalt paving areas and curbing;

6.22.1.1 (2) (b) concrete paving areas and curbing;

6.22.1.1 (2) (c) concrete sidewalks and slabs on grade; and

6.22.1.1 (2) (d) unit paver areas;

6.22.1.1 (3) design the depth of aggregate base courses to exceed limits defined by regional average freeze thaw cycles averaged over a twenty-year period; and

6.22.1.1 (4) ensure that granular sub-base and base materials and placement comply with the MMCD Latest Edition specifications and be acceptable to the Facility geotechnical consultant.

6.22.2 Concrete Paving

The Design-Builder will:

6.22.2.1 (1) use concrete paving in areas that require firm, long lasting hard surfaces for activities such as pedestrian pathways, loading dock areas and Facility entrances;

6.22.2.1 (2) for secondary concrete walkways, provide a minimum width of 3.0 metres, unless noted otherwise. Provide widened sidewalks at all entrances and drop-off locations;

6.22.2.1 (3) for primary walkways, provide a minimum width of 3.0 metres, unless noted otherwise;

6.22.2.1 (4) ensure all pedestrian walkways and sidewalks are Accessible/Barrier-Free;

6.22.2.1 (5) for concrete paving of pedestrian pathways and Facility entrances, conform with the following:

6.22.2.1 (5) (a) 100 mm compacted granular base on prepared subgrade, as per MMCD standards;

6.22.2.1 (5) (b) finish to be broomed or sand blasted, with tooled edges and control joints at 2.4 metres; and

6.22.2.1 (5) (c) isolation joints at maximum 4.0 metres;

6.22.2.1 (6) for concrete paving of loading dock areas, conform with the following:

6.22.2.1 (6) (a) 150 mm concrete on minimum 100 mm compacted granular base on 200 mm compacted granular sub-base on prepared subgrade, as per MMCD standards;

6.22.2.1 (6) (b) finish to be broomed or sand blasted with tooled edges and control joints at 3.0 metres; and

6.22.2.1 (6) (c) isolation joints at maximum 6.0 metres;

6.22.2.1 (7) for coloured concrete, use integral colour only (no surface colour treatment permitted).

6.22.3 Asphalt Paving

The Design-Builder will:

6.22.3.1 (1) use asphalt paving in hard surfaced games areas, bicycle pathways, and where vehicle traffic and snow clearing equipment require a smooth surface for travel;

6.22.3.1 (2) provide concrete and asphalt paving material and compaction in accordance with MMCD requirements;

6.22.3.1 (3) design asphalt mix for use in climatic conditions found in the Lower Mainland;

6.22.3.1 (4) ensure that asphalt paving in pedestrian and hard surfaced games areas are 50 mm #2 upper course as defined by the MMCD specifications, on top of a base course of a minimum of 100 mm 19 mm minus crushed rock on prepared sub-grade. Provide painted games lines suitable for intended use; and

6.22.3.1 (5) ensure that asphalt paving in vehicle traffic areas are 50mm #2 upper course as defined by the MMCD specifications on top of a base course of 100mm 19mm crushed rock on a minimum of 300mm of granular sub-base on prepared subgrade. Provide painted pavement markings and symbols suitable for intended use.

6.22.4 Unit Paving on Sand Bed

The Design-Builder will:

6.22.4.1 (1) use unit pavers in areas where a high level of finish is desired and/or a requirement exists for removal and replacement of paved surface in the future. Stamped coloured concrete treatment could be used as an alternative low maintenance high level of finish solution where applicable and in some cases may be the preferred solution by the owner. Unit pavers to be uniform in material, colour and size and from one manufacturer;

6.22.4.1 (2) ensure unit pavers are uniform in material, colour and size and from one manufacturer;

6.22.4.1 (3) ensure unit pavers have a minimum average compressive strength of 50 MPa (7250 psi) (CAN3 - A231.2 - M85) and resistance of 50 freeze thaw cycles (ASTM C67);

6.22.4.1 (4) place unit pavers on a 25 mm sand setting bed on a 150mm (6”) layer of 19 mm (3/4”) crushed granular base course evenly graded and compacted to 98% SPD;

6.22.4.1 (5) ensure sand setting bed is free of deleterious soluble salts and other contaminants, which may cause efflorescence. Comply with ASTM, C33, CAN/CSA A231.1-M9-0;

6.22.4.1 (6) apply and stabilize with sand sealer joint sand; and

6.22.4.1 (7) ensure that all edges of the paver installation are restrained with aluminum or approved rigid edging.

6.22.5 Gravel Walkways

6.22.5.1 (1) The Design-Builder will excavate and install gravel walkways using 10mm screening (crushed dust) at 2,000 mm wide x 150 mm.

6.22.6 Fences and Gates

The Design-Builder will:

6.22.6.1 (1) meet the COV fence by-law;

6.22.6.1 (2) provide vehicular traffic control gate at parking lot at Willow Street;

6.22.6.1 (3) provide 1.8 metre high chain link fencing along interior lot lines, with pedestrian-only access opening where required in consideration of pedestrian traffic to Site;

6.22.6.1 (4) fence materials will be designed and fabricated to guarantee a minimum 40-year lifetime; and

6.22.6.1 (5) install fences as per manufacturer's directions, or custom designed with footings to withstand freeze thaw cycles in the region averaged over the last twenty years.

6.22.7 Chain Link Fencing

The Design-Builder will provide chain link fencing that conforms with the following requirements:

6.22.7.1 (1) Fabric: chain link, 9-gauge galvanized steel wire woven in a 50 mm mesh. 1800 mm high unless otherwise notes, 25 mm above finished grade;

6.22.7.1 (2) Line Posts: 60 mm outside diameter (OD) schedule 40 galvanized steel pie. Minimum width 4.04 kg per metre. Line post spaces at 3 metres maximum OC;

6.22.7.1 (3) End, corner, and straining posts; 75mm OD schedule 40 galvanized steel pipes; Gate Posts: 89mm ID schedule 40 galvanized steel pipes complete with suitable tops;

6.22.7.1 (4) Concrete footings: minimum 20.0MPa concrete Minimum Dimension: 1 gate posts, terminal posts and corner posts: 1060 mm deep, 300 mm OD, 2 line posts: 920 mm dep, 250 mm OD;

6.22.7.1 (5) Top and mid rails: 40 mm OD schedule 40 galvanized steel pipe. Top and mid rails to be installed with continuous electrically welded joints and hot dipped galvanized after welding;

6.22.7.1 (6) Braces: 41.2 mm schedule 40 galvanized steel pipe. Horizontal brace spaced midway between top rail and bottom fence and to extend from terminal;

6.22.7.1 (7) Fittings: Hot dipped galvanized caps of suitable dimension to be installed on all posts. Eye tops to be pressed steel type;

6.22.7.1 (8) Hardware to suit details;

6.22.7.1 (9) Fabric bands: fabric is to be fastened with 3.77 mm (9 gauge) aluminum tie wire at each knuckle to top rail and at 183 mm on centre to end and line posts to within 200 mm above grade;

6.22.7.1 (10) Tension wire; 4.8 mm (6 gauge) single strand 610 g/m^2 electrogalvanized wire will be stretched taut along the bottom of fabric and attached to end and corner posts with a turnbuckle and fixed to chain link fabric with 4.8 metres (6 gauge) aluminum hog rings at every 3rd knuckle;

6.22.7.1 (11) Fabricate gates with continuous electrically welded joints and hot dipped galvanized after welding. Furnish gates with galvanized malleable iron hinges, latch and latch catch with provisions for padlock which can be attached and operated from wither side of installed gate; and

6.22.7.1 (12) Galvanizing: 55g/m^2 to ASTM for pipe for other fittings to CAN/CSA – G164. All welds to be painted with galvanized paint.

6.22.8 Exterior Site Furnishings

6.22.8.1 (1) Basic Requirements

6.22.8.1 (1) (a) The Design-Builder will provide site furnishings consisting of benches, picnic tables, trash and recycling containers, tables and chairs, in any outdoor area adjacent to the Facility for staff, students and visitors in coordination with the Owner. Products will be selected on the basis of safety, comfort, design and materials that relate to the building architecture and landscape design, durability and required maintenance.

6.22.8.1 (1) (b) Exterior trash and recycling containers are to be Millennium Series In-Ground Trash Systems by SyberTech Waste Reduction Ltd. or equivalent system.

6.22.8.1 (1) (c) The benches and picnic tables are to be made of concrete with footings poured in place on a concrete slab.

6.22.8.1 (1) (d) A minimum of 3 picnic tables will be supplied at outdoor amenity areas or other designated picnic areas.

6.22.8.1 (1) (e) Picnic table dimensions to be a minimum of 760mm height x 1520mm wide x 1520mm in length with one end of picnic table length extended for wheelchair accessibility.

6.22.8.1 (1) (f) A 10.7 metre height cone tapered flagpole will be provided which has been fabricated with type 304 alloy. It will include a revolving trucking ball, and a shoe anchor base, and the finish will be clear anodized aluminum. Rigging will consist of an internal halyard provided with a locking door. Secure all picnic tables to be secured against theft or vandalism and are to be flush with surrounding grade for wheelchair accessibility.

6.22.8.1 (2) choose bicycle racks for LEED requirements and theft prevention. Bicycle racks to be individual components which can be embedded, or surface mounted to prevent vandalism and theft. Multi-ringed racks with only three or less surface mounts will not be acceptable.

6.22.8.1 (3) treat and color all bicycle racks as required to match character of design and other furnishings selected for the Facility. The racks need to be highly visible and minimize and separate impact to pedestrian flow.

6.22.9 Bicycle Parking and Storage

The Design-Builder will:

6.22.10 provide secure bicycle racks in bicycle parking areas at key entrances to the Facility and at key locations on the Site;

6.22.11 ensure that the layout of bike racks meets COV standards, quantities and manufacturer's specifications, and exact location is subject to Owner approval;

6.22.12 provide asphalt paved bicycle parking area with racks in conformance with COV bylaws;

6.22.13 provide secure bicycle storage complete with lighted canopies with drainage;

6.22.14 install on designated purpose concrete pad covered bicycle racks and enclosed and covered secure bicycle program storage;

6.22.15 ensure bicycle racks accommodate 8-10 bikes per rack and are Cora, Expo Rack W7510, W4508, or acceptable equivalent; and

6.22.16 select products for their suitability and durability.

6.22.17 Growing Medium

The Design-Builder will:

6.22.17.1 (1) provide growing medium that is a mixture of mineral particulates, micro organisms and organic matter which will provide a suitable medium for supporting plant growth;

6.22.17.1 (2) ensure all growing medium properties meet the Canadian Landscape Standard, Section 6;

6.22.17.1 (3) submit to the Owner a copy of a growing medium analysis from a laboratory approved by the Owner. Results of these tests will be presented to the Owner for review before any growing medium delivery to Site;

6.22.17.1 (4) ensure minimum depths of growing medium are:

6.22.17.1 (4) (a) tree pits: 900mm (3'-0);

6.22.17.1 (4) (b) shrub beds: 450mm (18");

6.22.17.1 (4) (c) ground cover areas: 300mm (12");

6.22.17.1 (4) (d) sodded lawn areas: 300mm (12"); and

6.22.17.1 (4) (e) seeded lawn areas: 100mm (4").

6.22.18 Hydraulic Seeding

The Design-Builder will:

6.22.18.1 (1) use hydraulic seeding in areas of the Site which require stabilization and provision of permanent cover;

6.22.18.1 (2) not use seed in areas immediately adjacent to, or within programmed spaces such as patios, courtyards, and Facility entrances;

6.22.18.1 (3) seed all grassed areas with a mixture that contains a minimum of 50% species native to the Lower Mainland. All species of grasses will have a maximum mature height of 450-600mm;

6.22.18.1 (4) provide seed mix that has a demonstrated suitability to the climatic and soil conditions found in the Lower Mainland.

6.22.19 Sodding

The Design-Builder will:

6.22.19.1 (1) locate sod in areas near Facility entrances, and outdoor patio spaces to provide a usable surface for staff breaks, visiting, passive recreation and student activities;

6.22.19.1 (2) provide sod that is:

6.22.19.1 (2) (a) nursery grown, conforming to the latest edition of Canadian Landscape Standard;

6.22.19.1 (2) (b) class 1 No. 1 Premium Turf Grass;

6.22.19.1 (2) (c) grown in topsoil and free of disease, nematodes, soil-born insects, clover, stones and debris; and

6.22.19.1 (2) (d) major species are Fescues and cultivated in nursery fields as turf grass crop in climatic zone comparable to the Lower Mainland;

6.22.19.1 (3) install sod in accordance with best practices, tested and Owner approved;

6.22.19.1 (4) place amended topsoil growing medium to a minimum depth of 300 mm;

6.22.19.1 (5) repair, regrade, top-dress, re-sod and maintain lawn areas (including temporary irrigation) as required to obtain an even, uniform stand of grass until established;

6.22.19.1 (6) note that sod is considered established when it is dense, rooted into the underlying soil, showing no signs of yellowing, and in a healthy condition; and

6.22.19.1 (7) begin maintenance immediately after installation.

6.22.20 Trees, Shrubs and Ground Cover Planting

The Design-Builder will:

6.22.20.1 (1) ensure that the planting supports the landscape design by reinforcing spatial relationships and wayfinding;

6.22.20.1 (2) address in the plant selection and placement micro-climates surrounding the Facility and ensure it mitigates heating and cooling loads as well as providing a comfortable exterior environment for students, staff and visitors;

6.22.20.1 (3) design planting to emphasize species indicative of the Coastal Western Hemlock Biogeoclimatic Zone, which includes the following tree species: Western hemlock, Western redcedar, Douglas fir, grand fir, Western white pine, bigleaf maple, red alder and black cottonwood;

6.22.20.1 (4) select and place trees, shrubs and ground covers to mitigate temperature fluctuations and winds;

6.22.20.1 (5) select trees, shrubs and ground covers from species and varieties that are either indigenous or adapted to the region;

6.22.20.1 (6) not install fruiting trees or shrubs;

6.22.20.1 (7) not install any plants listed as poisonous to humans by the Canadian Government's 'Canadian Poisonous Plants Information System';

6.22.20.1 (8) ensure that plants comply with the current edition of the Canadian Landscape Standard, published by the Canadian Society of Landscape Architects and the Canadian Nursey Landscape Association;

6.22.20.1 (9) plant only during the season which are normal for such work, determined by weather conditions. Do not plant during freezing, abnormally hot, dry or wet weather;

6.22.20.1 (10) ensure that plant material will be grown in Zone 7a to 8b in accordance with Plant Hardiness Zones in Canada.

6.22.20.1 (11) provide mulch for all landscape beds that are 9mm (3/8") Composted Bark Mulch, black/brown in colour and spread to a minimum thickness of 50 mm (2"). The mulch will be free of soil, rocks, seeds, chemicals or other deleterious materials;

6.22.20.1 (12) comply with all Japanese Beetle regulations as they relate to movement of rooted plants and soil as per the Canadian Food Inspection Agency, British Columbia Ministry of Agriculture, COV, and other industry and non-governmental stakeholders.

6.22.21 Landscape Maintenance

6.22.21.1 (1) The earlier of the Substantial Completion Date or the completion of landscape planting will constitute the beginning of the 24 month warranty period and the one year establishment maintenance period for landscape planting (shrubs, perennial beds and sod) and two years for all trees.

6.22.21.1 (2) The Design-Builder will replace all unsatisfactory plant material and continue to replace such plant material until the replacement is acceptable, for a period of 24 months beginning from completion of landscape planting or Substantial Completion, whichever is earlier, at no cost to the Owner.

6.22.21.1 (3) The Design-Builder will develop maintenance procedures for all new plants, cultivated turf grass, seeded areas and all trees and shrubs.

6.22.21.1 (4) The Design-Builder will keep, during the one-year establishment maintenance period, a logbook to record all maintenance activities and operations and Site conditions that require attention. The Design-Builder will provide to the Owner a copy of this information each time a report is written. A minimum of three maintenance reports will be made during each growing season.

6.22.21.1 (5) during the establishment maintenance period, the Design-Builder will undertake the following activities:

6.22.21.1 (5) (a) maintaining all newly planted areas in a weed-free condition;

6.22.21.1 (5) (b) fertilizing the planting areas and lawn areas;

6.22.21.1 (5) (c) pruning;

6.22.21.1 (5) (d) replacement of dead or diseased plants;

6.22.21.1 (5) (e) watering in sufficient quantities and frequency to maintain optimum soil moisture;

6.22.21.1 (5) (f) lawn mowing;

6.22.21.1 (5) (g) protect all pre-existing and newly planted trees, shrubs and other plant materials, Site services, curbs, asphalt, and

structures against any damage throughout the establishment maintenance period;

6.22.21.1 (5) (h) lawn mowing will be carried out at regular intervals to maintain grass at a maximum height of 60mm (2.5”). Edges of sodded areas will be straight and neatly trimmed;

6.22.21.1 (5) (i) in March and June of the first growing season, fertilize all exterior planting areas with the fertilizer recommended by the landscape architect. Repeat the fertilizer application in March of the second growing season; and

6.23 Utilities (Division 33)

6.23.1 The Design-Builder will provide utility works that will service the Facility and the expected land use with a reliable infrastructure that will be maintainable without disrupting the effective operation of the Facility and related land uses.

6.23.2 The Design-Builder will use materials that conform to the COV standards.

6.23.3 The Design-Builder will design and construct the utility works in accordance with the latest edition of MMCD.

6.23.4 Refer to Section 5.4 – Civil Engineering.

6.23.5 For foundation drainage, the Design-Builder will:

6.23.5.1 (1) provide foundation drainage that will carry all sub-surface ground water away from footings and foundation walls and into the Site storm drainage system;

6.23.5.1 (2) provide pipes made of Polyvinyl Chloride pipe (perforated): to ASTM D2729, with required fittings.

6.23.5.1 (3) provide accessories required for the foundation drainage system including:

6.23.5.1 (3) (a) Pipe joint: Single gasketed integral bell and spigot joint;

6.23.5.1 (3) (b) Filter Fabric: Water pervious type, black polyolefin or polyester; and

6.23.5.1 (3) (c) Filter aggregate and bedding: 25mm clear stone free of fines or stones smaller than 15mm or larger than 35mm;

6.23.5.1 (4) provide sediment sump on foundation drainage system prior to connection to Site storm drain system, including backwater valve and downturned elbow on sump outlet piping. Refer to [COV standard drawing P/SD #2001D] for details;

6.23.5.1 (5) install cleanouts to code requirements and extend to finish grade, and provide 300mm x 300mm x 100mm thick concrete pad around cleanout where located in landscape or other non-hard surfaced areas;

6.23.5.1 (6) ensure that the installation will meet the requirements of the MMCD, VBBL, and all other applicable municipal codes and bylaws.

6.23.6 For natural gas site piping, the Design-Builder will:

6.23.6.1 (1) comply with ANSI B31.2 Fuel Gas Piping and NFPA 54 National Fuel Gas Code;

6.23.6.1 (2) perform such work in accordance with the requirements of the gas transmission utility, and all local governing codes and bylaws;

6.23.6.1 (3) provide gas meter and meter enclosure to local gas utility standards;

6.23.6.1 (4) be responsible for confirming and coordinating location, size and details of meter installation with gas utility and Owner;

6.23.6.1 (5) ensure that enclosure is chain link with lockable access doors as per gas utility provider requirements;

6.23.6.1 (6) ensure that gas service includes a seismic gas valve and protective enclosure located at the point of entry to the Facility;

6.23.6.1 (7) for welding materials and procedures, conform to ASME Boiler and Pressure Vessel Code and applicable provincial regulations;

6.23.6.1 (8) ensure individuals providing such work have welder's certification in accordance with ASME SEC IX; and

6.23.6.1 (9) conform to NFPA 54, ANSI B31.2, ANSI B31.8.

APPENDIX 1A

SCHOOL FUNCTIONAL PROGRAM

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1.1 Technical Acronyms

1.1.1 ADA – Americans with Disabilities Act

1.1.2 ELL – English Language Learners

1.1.3 LAC – Learning Assistance Centre

1.1.4 LALS – Learning Assistance Life Skills

1.1.5 LLC – Library Learning Commons

1.1.6 LS – Life Skills Program

1.1.7 LSP – Learning Strategies Program

1.1.8 mm – Millimetres

1.1.9 MAC Lab – Macintosh Lab

1.1.10 PDC – Professional Development Centre

1.1.11 SLO – Student Liaison Officer

1.1.12 SM – Square Metre(s)

1.2 Understanding this Document

1.2.1 Programming is the gathering of information related to the School objectives, building use, space requirements, relationships, and adjacencies. The Functional Program is the compilation of that information and is used to translate the findings into design criteria. The information provided in this document is related to both the operational and physical adjacencies as well as the spatial requirements of the School. Each section of this document has been reviewed by the user group members.

1.2.2 Parts 2 and 3 of this document present a summary of the School scope and the general requirements for each functional component as it relates to use, location, and adjacencies within the context of the School. Detailed information relating to programmed rooms within each department can be found in Appendix 1B – School Room Data Sheets.

1.2.3 The Area and Adjacency Diagrams demonstrate the relationship between departments and relationship of spaces to each other within each department.

1.3 Functional Program Assumptions

1.3.1 The School will have a nominal capacity for 1,700 grades 8 to 12 students and approximately 120 teachers, administrators, and staff.

1.3.2 The overall program area for the School is 11,580 SM. Refer to Table 1 – School Department Program Area Summary.

1.3.3 The School program consists of 15 departments of which two (2) are supporting services as show in Table 1 – School Department Program Area Summary.

1.3.4 Area of each School department is summarized in Table 1 – School Department Program Area Summary.

1.3.5 Figure 1 presents an adjacency diagram for the School's ground floor.

Table 1 – School Department Program Area Summary

Reference	Department	Minimum Net Square Metre (SM)
1.0	Library Learning Commons	428.0
2.0	Administration, Health, Counselling, and International Education	388.0
3.0	Multi Purpose	365.5
4.0	Fine Arts	1380.0
5.0	Athletics	1918.0
6.0	General Instruction	2912.0
7.0	Science	1390.0
8.0	Applied Skills - Industrial Education	730.0
9.0	Applied Skills - Home Economics	405.0
10.0	Applied Skills - Business Education and Computers	585.0
11.0	Special Education	570.0
12.0	Building Engineering and Operations	358.5
13.0	General Storage	150.0
	Sub Total	11,580.0
14.0	Design Space*	3215.0
15.0	Programmed Exterior Space (as described in the section)	
* Locker area, Washrooms (shared and individual), Showers, Corridors, Stairs, Elevator, Service Rooms (Mechanical, Electrical, Communications, Janitor), Walls. Area designated is a minimum area requirement.		
	Total for School Program area	14,795.0

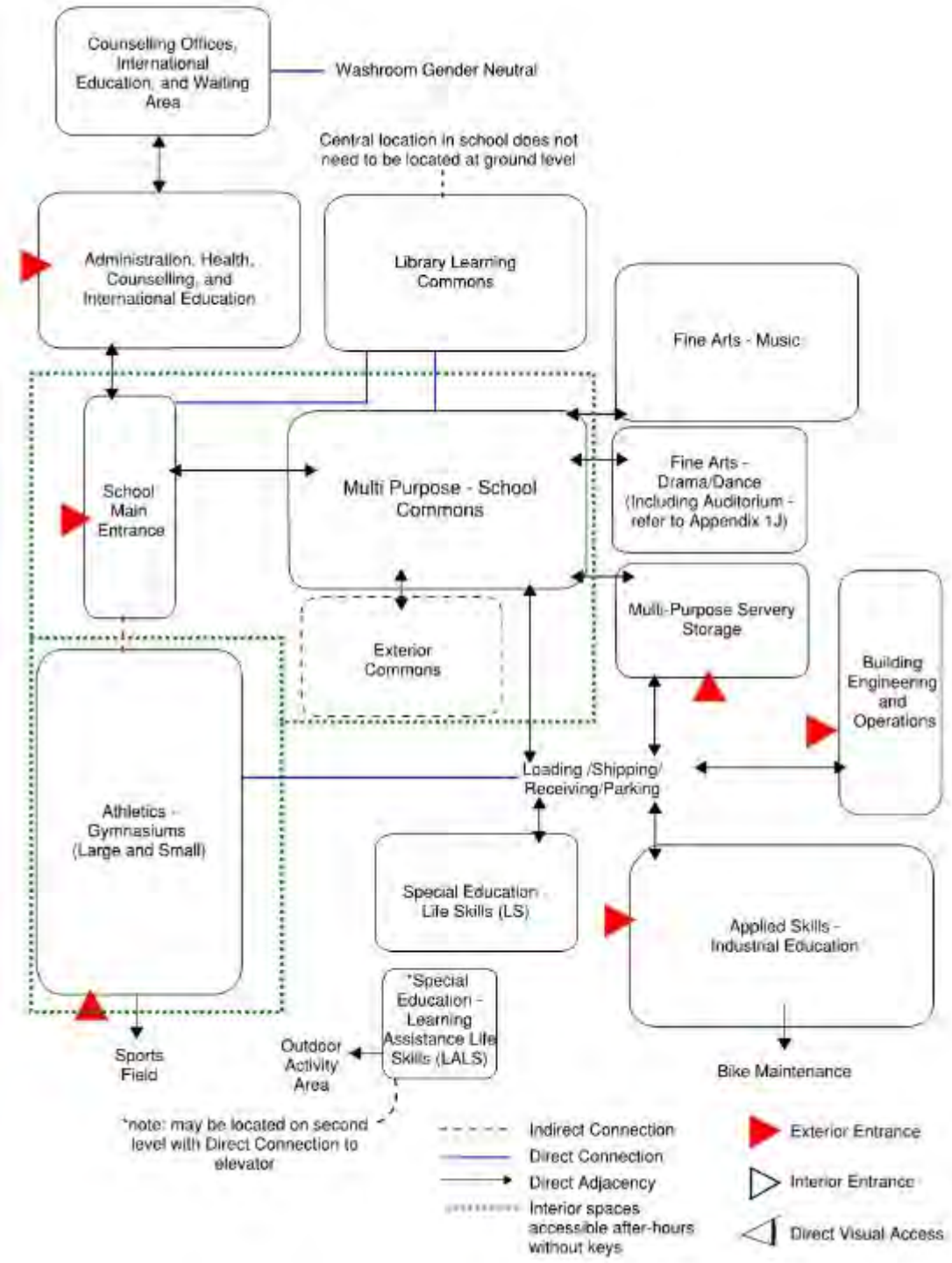


Figure 1: Adjacencies Diagram for School Departments on Ground Level

PART 2. GENERAL PLANNING CRITERIA

2.1 Criteria

2.1.1 The Functional Program is based on the concepts of equality, futureproofing, flexibility, and universal space typologies focused on optimizing use of rooms and spaces for a changing environment.

2.1.2 Critical to the success of this approach is an understanding of the importance of universal spaces. By creating universal space typologies that are program adaptable, the Owner can manage fluctuations in programming needs and populations, as well as maximize space utilization over time.

2.1.3 A key component in creating an optimized learning environment is the provision of space to be program adaptable and universally equipped. This allows the environment to respond to daily, monthly, and yearly fluctuations in utilization of space by 'like' programs. Standardization of room typologies provides opportunities to maximize operational efficiency, and the built environment.

2.2 Departmental Learning Zones

2.2.1 The School will be organized within departmental components in close adjacency to each other. Teaching spaces are to be equal and flexible in order to allow different programs and departments to grow and shrink based on student enrollment as well as to accommodate future programs in the School. Equality of spaces and creation of universal typologies where possible will allow for greater flexibility in the School.

2.2.2 Classrooms will not be arranged into any clustering of forms as this is seen as being inflexible and exclusive. The cluster form does not allow for flexibility as departments grow and shrink. Figure 2 and Figure 3 are diagrams shown for reference only to illustrate the design intent.

2.2.3 While not a requirement, student huddles that allow for general student study are encouraged in as many Departmental Learning Zones as possible. The student huddle is an extension of the corridor space and considered part of the School gross up. Student huddle spaces will vary in size and to be distributed amongst the different floors of the School.

2.2.4 A General Bookroom will be located on each level of the School which will be shared by all departments. The area for these bookrooms can be found in Section 3.13.

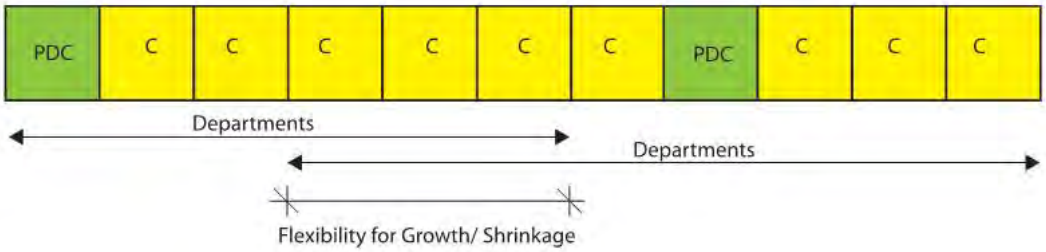


Figure 2: Design example of academic learning zone diagram showing opportunity for future change.

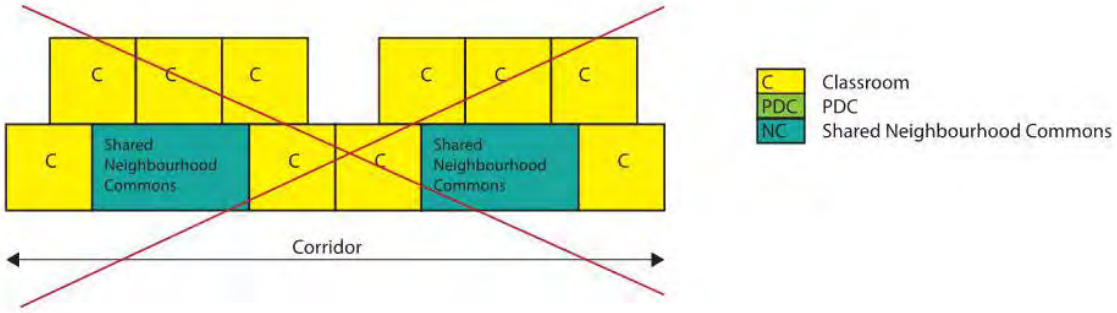


Figure 3: Design example showing academic pods that will not be used.

2.3 Lockers

2.3.1 1,700 general use lockers will be provided to the School for student use.

2.3.2 General use lockers do not include lockers that are specific to a department such as Athletics and staff use lockers.

2.3.3 Gymnasium lockers are to be half height with 90 in the girls' change room and 90 in the boys' change room. The Gymnasium locker counts are in addition to the overall general use locker counts.

2.3.4 General use lockers:

2.3.4.1 All general use lockers will be half height.

2.3.4.2 Lockers can be stacked if against a wall. Lockers not against a wall will not be stacked to maintain sightlines.

2.3.4.3 Locker placement will be a mix between locating them against corridor walls and as half height locker islands.

2.3.4.4 Locker islands: lockers not located against a corridor wall or a Classroom wall will be back-to-back half height lockers on a base with millwork sides and countertops in order to provide informal collaboration space and promote good visual sightlines.

2.3.4.5 Both primary and secondary corridors are permitted to have lockers provided that the clearance requirements are met on one (1) side only and that they will not be placed along both sides of the corridor in such a manner so as to result in lockers directly facing each other across the corridor.

2.3.4.6 Space efficiencies will be explored to locate display cases or storage above the half height lockers.

2.3.4.7 Lockers will demonstrate barrier-free accessibility as required by VBBL requirements.

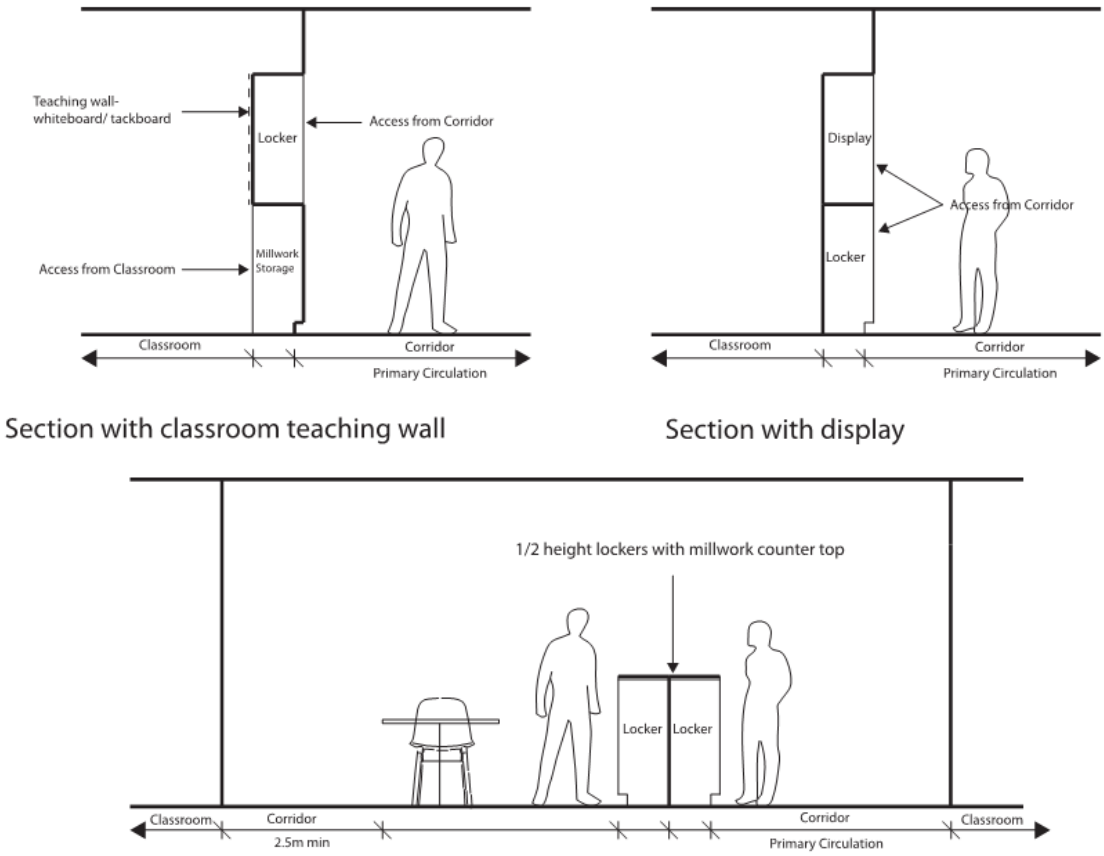


Figure 4: Design example – Locker Section Sample

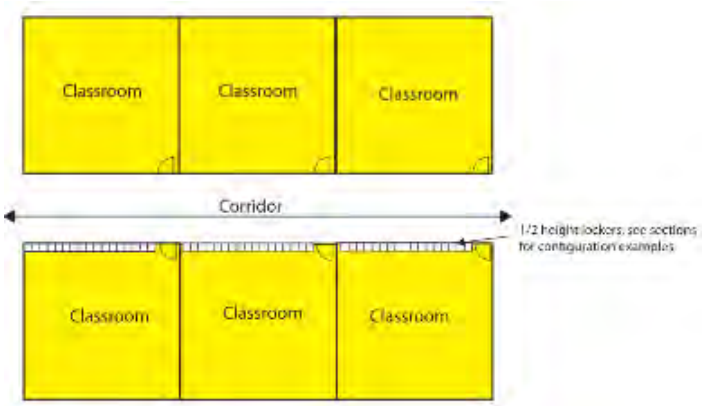


Figure 5: Design Example of Corridor Lockers

2.4 PDC

2.4.1 A PDC is shared teacher collaboration space that is provided to each department. The PDC will act as a home base for full-time, part-time, or visiting staff and is a space for small department level meetings to take place.

2.4.2 PDCs will have three (3) sizes and will be allocated according to department size.

2.4.2.1 Small PDC (2-3 staff) = 8 SM

2.4.2.2 Medium PDC (4-5 staff) = 15 SM

2.4.2.3 Large PDC (5-8 staff) = 25 SM

The Athletics Department is unique and its PDC will be designed with adjacencies to the Gymnasium Large and Gymnasium Small as noted in the requirements below. (Refer to

2.4.3 Table 2.)

The other departments will have one (1) PDC each in close proximity to their respective groups of formal learning spaces. (Refer to

2.4.4 Table 2.)

Table 2 – PDC per department

Counselling	Medium PDC
Fine Arts	Medium PDC
Athletics	Large PDC
Science	Medium PDC
General Instruction (Humanities ELL)	Small PDC
General Instruction (Humanities Social Studies)	Medium PDC
General Instruction (Humanities English)	Medium PDC
General Instruction (Languages)	Medium PDC
General Instruction (Math)	Medium PDC
Applied Skills (Industrial Education)	Small PDC
Applied Skills (Business Education, Computers)	Medium PDC

2.4.5 There is no requirement for a PDC for Applied Skills - Home Economics.

2.4.6 Special Education requires privacy and, other than Administration, will be the only department that will have private staff offices in place of a PDC.

2.4.7 Design examples of the three (3) PDC typologies are shown in Figure 6. (Figure 6 is a diagram shown for reference only to illustrate the design intent; furniture is shown for scale only.)

2.4.8 Two (2) types of layouts for Small PDC and Medium PDC (i.e. Type 1 and Type 2) in Figure 6 indicate millwork options that each department can pursue for its PDC depending on the type of storage needs required. The storage and counter surface in all PDC will be millwork.

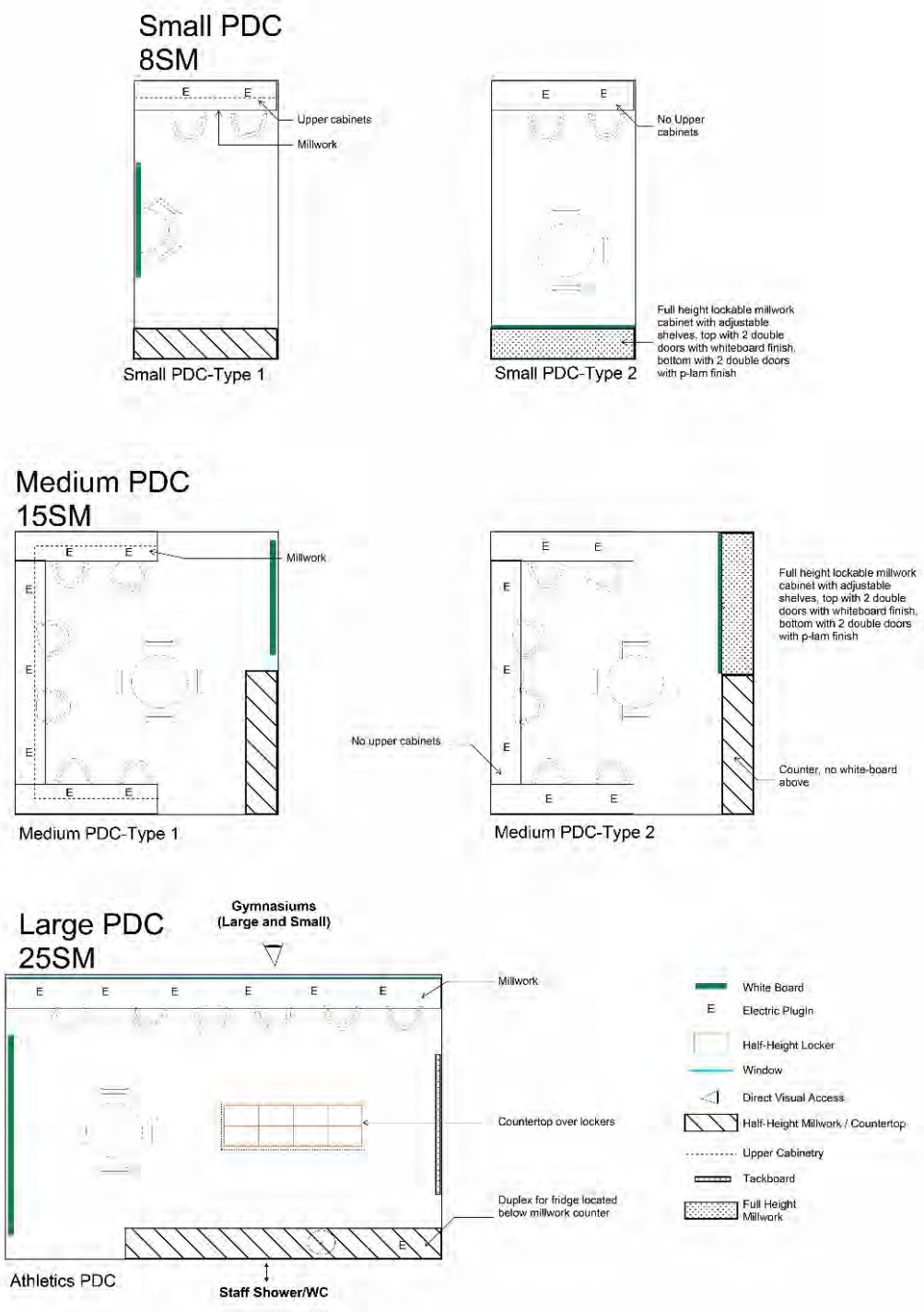


Figure 6: Design Example of PDC Typologies

2.5 Storage Types

2.5.1 There are two (2) categories of storage for the School's academic departments: General Bookroom and room-based storage. Refer to Appendix 1B – School Room Data Sheets.

2.5.2 Type 1 – General Bookroom is for storage of books, equipment, and supplies that pertain to all departments of the School. The General Storage department for the School is split into four (4) storage areas. There will be one (1) General Bookroom located on each level and an Admin Archive Storage on the ground level in addition to the General Bookroom for the academic department storage.

2.5.3 To allow for future flexibility, each of the General Bookroom Storage spaces will be equipped with electrical and data rough-ins to allow for easy conversion of these spaces into future teaching and learning areas. In the future, some of the bookrooms may be converted into PDCs, student workspaces, sensory rooms, or other teaching and learning environments. Rooms will have a minimum 3 metres dimension. Long, narrow rooms are to be avoided.

2.5.4 Type 2 – Room-based storage. Classrooms will require millwork storage to meet specific needs for each department. Design examples of how millwork in teaching spaces interface with lockers and other corridor side display needs are shown in Figure 4. Where possible, efficiency in storage requirements is to be maximized.

2.5.5 The storage areas described do not include custodial closets which are separate requirements that come out of the facility gross up. They also do not include the Surplus Storage and Custodial Storage that are described in Appendix 1B – School Room Data Sheets.

2.6 Transparency, Sightlines, and Window Coverings

2.6.1 Visual access to exterior spaces is important in all teaching spaces and all teaching spaces (unless noted) will have operable windows to the exterior. While glazing is to be located between teaching spaces and public corridors to promote transparency and collaboration, a balance is required between providing sufficient teaching/display walls versus glazed areas. All interior glazing between public corridors / spaces and programmed spaces will have roller shades that cover the entire width and length of the glazing unit.

2.6.2 All glazing to the exterior will have roller shades on the interior to cover the entire width and length of the glazed area. The required lengths and location for interior glazing into General Instruction classrooms are shown in Figure 7.

2.6.3 To maintain sightlines and for functionality, a minimum clearance between the finished floor and any overhead objects will be as per Schedule 1 - Statement of Requirements and Appendix 1B – School Room Data Sheets. Suspended linear direct/indirect fixtures, if used, may project no more than 450 mm below the clear ceiling.

2.6.4 Figure 7 is shown for reference only to illustrate the design intent, furniture is shown for scale only.

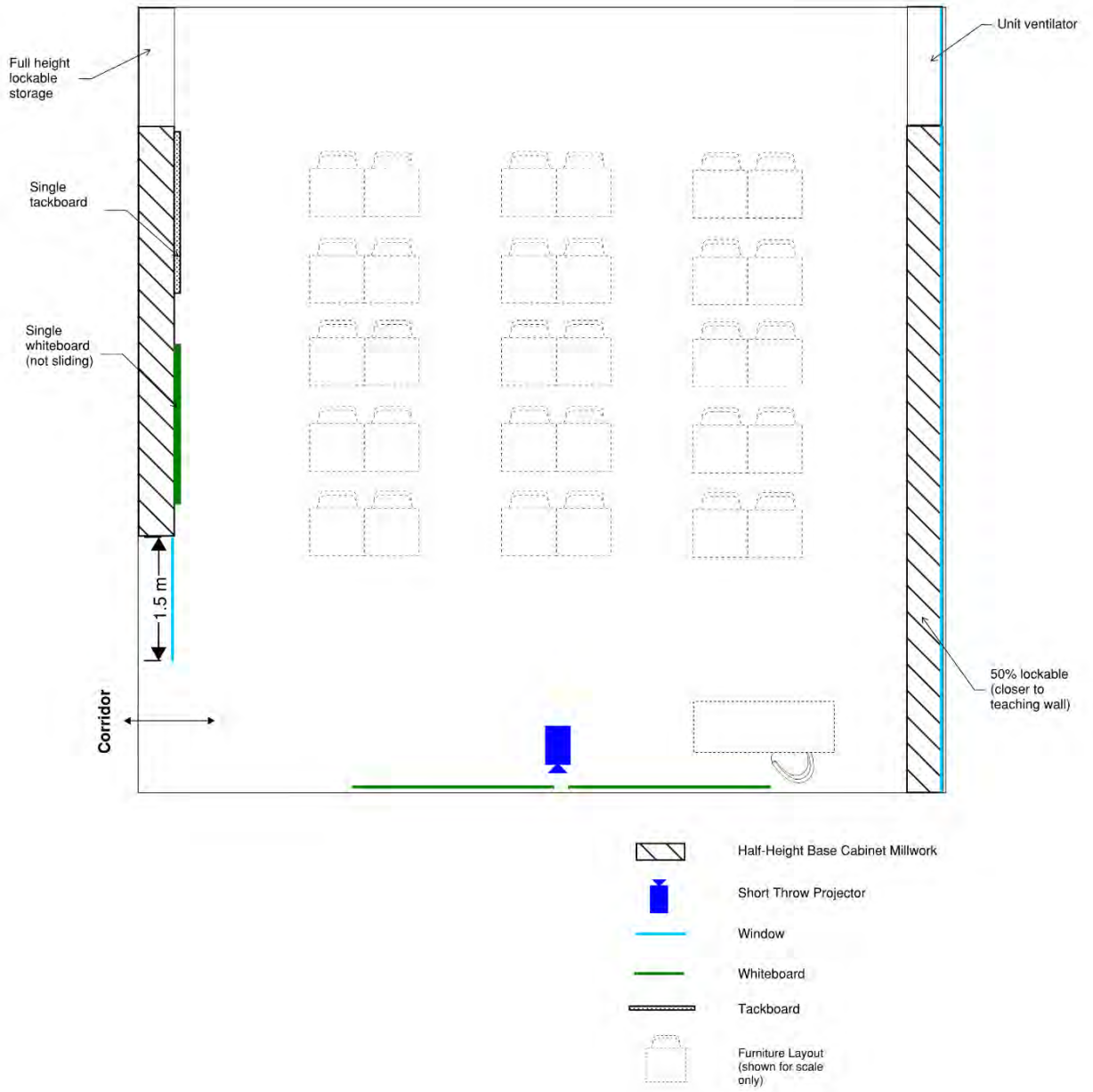


Figure 7: Design Example of Classroom Transparency

2.7 Public Displays / Public Communication Boards

2.7.1 Display areas throughout the School are required for showcasing student work. Display millwork will be distributed on walls in corridors and is not to impede daylighting opportunities. In addition to display areas, vertical tack boards located in public areas are required for communication of events, notices, and advertisement. Tack board requirements inside programmed spaces are in addition to this requirement. Displays for heritage and memorabilia are in addition to this requirement.

2.7.2 All student display area casework is to have appropriate lighting within the millwork and be lockable. The minimum depth for casework is 500 mm. The minimum vertical area is indicated in the chart below. Casework along a corridor will be at same datums in order to provide a continuous look and will not vary in height (unless there is a unique display requirement).

2.7.3 One General Display casework is to be located centrally in a highly visible location on each floor. In addition to this, department specific casework is to be provided per the table below.

Table 3 – Display Casework

Area	Vertical Student Display Casework Area (taken from School gross) *	Minimum Vertical Tack Board Display Area
Athletics	8 Linear Metre	2.5 SM
Library Learning Commons Entry	8 Linear Metre	2.5 SM
Multi Purpose (dispersed prominently within entrance and Servery)	16 Linear Metre	5.0 SM
Classroom - Mathematics	6 Linear Metre	-
General Display (located on each floor)	8 Linear Metre	2.5 SM

2.8 Accessibility and Barrier Free

2.8.1 All student, visitor, and staff use areas will be designed for access by disabled persons (students, staff, visitors, family members, or community members) using wheelchairs, walkers, crutches, and any equipment required for assistance with physical limitations. Barrier-free access will be made to all teaching spaces. Wheelchair accessible height counters and sinks will be provided for student, visitor and staff use areas.

2.8.2 Greater detail for accessibility requirements in the Special Education department, Science Classrooms and Home Economics Classrooms can be found in Part 3 of this document.

Picture 1 – Example of Accessibility in a Home Economics Classroom, Magee Secondary School

2.9 Washrooms and Water Fountains/Water Bottle Stations

2.9.1 Washrooms must be in high-traffic areas and not in dead-end zones to discourage bullying in washrooms. 'Doorless' washrooms are required for all gang-style/multiple-stall washrooms, for both anti-bullying and for infection prevention and control measures. From corridors there are to be no sightlines into toilet/urinals/changing areas and no sightlines to washroom mirrors from the corridors. Single occupancy washrooms will have full height walls and require doors. All washrooms will be in accordance with the VBBL requirements and the requirements outlined in the Schedule 1 - Statement of Requirements and Appendix 1B – School Room Data Sheets.

2.9.2 Six (6) accessible single occupancy washrooms (two (2) per floor, one (1) per gender) will be provided for staff use only. Five (5) of the six (6) required washrooms will be provided (per VBBL calculation) over and above the minimum NSM. The other additional washroom will be provided out of the programmed area (i.e. within the NSM calculation). Staff washrooms in the Athletics department (which is a programmed area) are in addition to this requirement.

2.9.3 Two (2) accessible gender-neutral washrooms are to be provided in the School. They are to be located on separate floors from each other. One of them is to be located in direct connection to the Administration, Health, Counselling, and International Education department and entrance to this washroom is to be accessible from the public corridor. The

other gender-neutral washroom will be located on a separate floor. The location of these washrooms will not be in high traffic areas, but they must have good sightlines to prevent bullying. These washroom areas come out of the School's programmed area and are included in the NSM.

2.9.4 One universal washroom, per VBBL, is to be provided. This washroom will be in direct connection to the Athletics department so it can double as a change room for students that do not identify as either female or male. A ceiling track (for a future handicap lift) is to be located for future use.

2.9.5 For further details on washroom requirements for specific departments such as the Life Skills washrooms in Special Education, staff washrooms in the Athletics department, washrooms in the Athletic locker rooms, and First Aid washroom, refer to Appendix 1B – School Room Data Sheets.

2.9.6 Each level of the School will have two (2) water fountains complete with water bottle stations to be located in an easy-to-find and high-traffic area that is accessible to all students, staff, and visitors. A water fountain complete with a water bottle station will be located in direct adjacency to the departments or areas listed below. They are to be located within the corridor spaces and not within the programmed areas. Water fountains complete with water bottle stations located to serve a department that requires after school or weekend access will be accessible to users during those additional hours. Refer to Schedule 1 – Statement of Requirements.

2.9.6.1 Gymnasium

2.9.6.2 School Commons

2.9.6.3 Dance Studio

2.9.6.4 Drama Studio

2.10 Furniture and Equipment

2.10.1 The School is to be provided with a fully functional suite of furniture and equipment. Both new and existing furniture and equipment will be planned for and accommodated within the School. Refer to Appendix 1B – School Room Data Sheets and Appendix 1D – Furniture, Fixtures and Equipment.

2.11 Millwork

2.11.1 Refer to Appendix 1B – School Room Data Sheets for detailed information regarding millwork requirements for the School. The millwork descriptions in Appendix 1B – School Room Data sheets are for general description purposes to determine preliminary direction and provide a sense of scope.

PART 3. FUNCTIONAL PROGRAM COMPONENT REQUIREMENTS

3.1 LIBRARY LEARNING COMMONS

3.1.1 Description

3.1.1.1 The LLC is considered to be a chamber of the heart of the School and is actively used by the School as well as for external meetings and events.

3.1.1.2 The LLC is both an instructional space as well as a space where students may go in their spare time to read or work in groups.

3.1.1.3 The LLC is also used by the community for special meetings and events.

3.1.1.4 The LLC houses a Fiction and Non-Fiction collection.

3.1.2 Direction

3.1.2.1 The LLC will:

3.1.2.1 (1) be centrally located within the School and easy to find.

3.1.2.1 (2) offer multiple areas of use including teaching, presentations, collaboration spaces, creative/maker space, individual quiet study areas, technology spaces, and informal lounge space.

3.1.2.1 (3) be a dynamic and flexible space that allows staff and students to collaborate and make use of various forms of technology to support inquiry-based learning.

Picture 2 – Example of Library Learning Commons, Saunders Secondary School

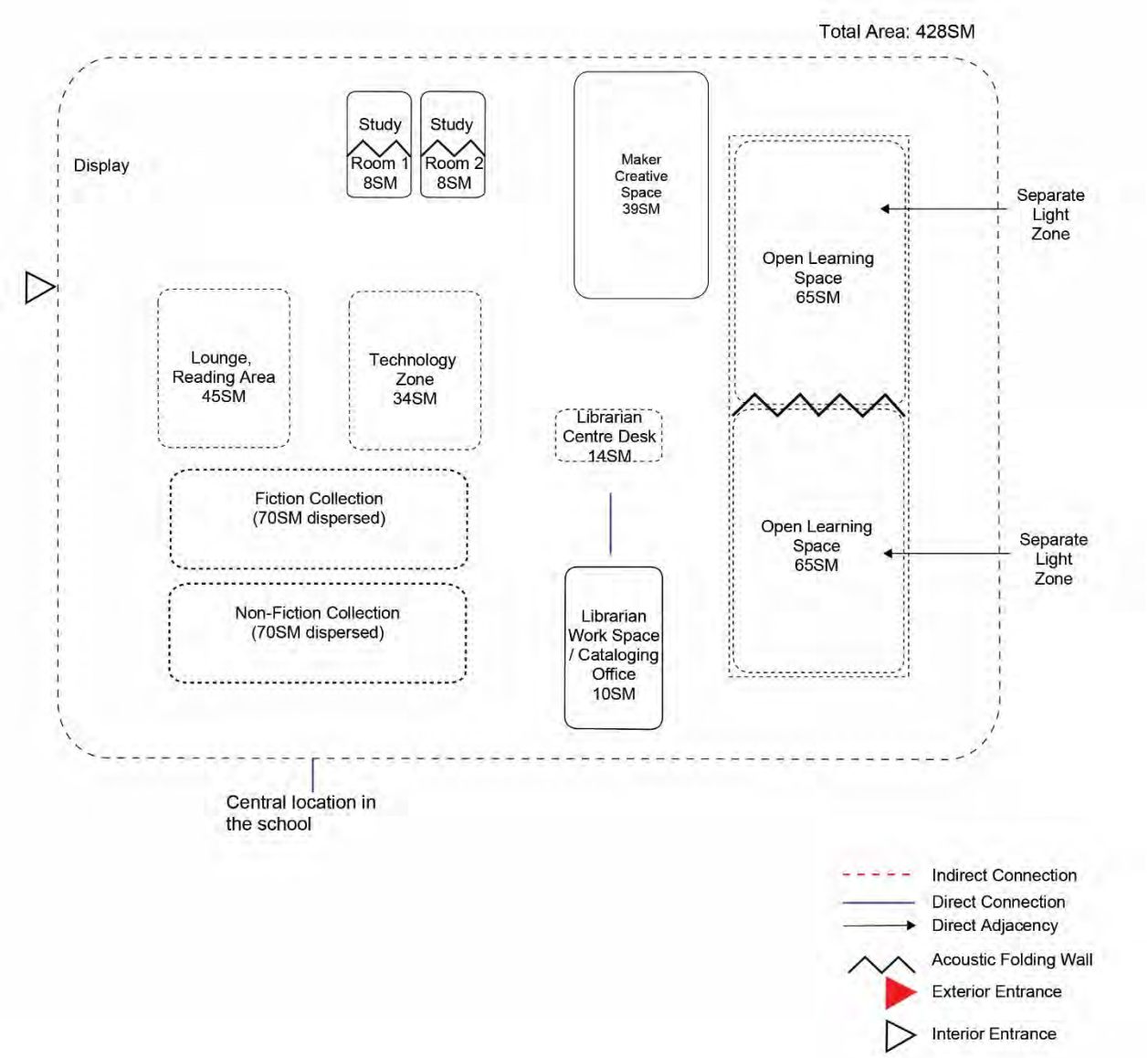
3.1.3 Location and Adjacencies

3.1.3.1 The LLC will be located on one (1) level in a visible area within the School which is easy to access and is in close proximity to the main School entrance and the School Commons. The interior wall separating the LLC from the corridor(s) will balance glazing for visibility from the interior of the School into the LLC and the ability to have full height shelving against walls and half height shelving. Counter height millwork running along the perimeter of the glazed wall portions will be used to accommodate some of the collections below the glazed portion.

3.1.3.2 Daylighting and visual access to the exterior from the LLC is required, however, a balance between collections against wall space and glazing is optimal. Roller blinds at glazing units in the teaching zones will be provided for multi-media capability.

3.1.3.3 Where adjacent uses are loud, acoustic ratings will be provided to ensure quiet study, testing, and presentations are not disrupted. Refer to Appendix 1C – Acoustic and Noise Control Ratings.

3.1.3.4 Security gates are required at the entrance to the LLC. Provide secure afterhours access to the LLC.



Area and Adjacency Diagram 1: LLC

3.1.4 Internal Adjacencies – Additional Remarks – Library Learning Commons

3.1.4.1 The Open Learning Space will be located such that it is not used by students as a circulation path to access another space of the library.

3.1.4.2 The Teacher Librarian Centre Desk is the centre of the space and will have visibility to all areas of the LLC.

Table 4 – Library Learning Commons department area breakdown and description

1.0	Library Learning Commons	# of Students	# of Staff/ Teachers	Quantity	Minimum NSM	Minimum Total NSM	Notes:
	Teacher Librarian Centre Desk	-	2	1	14.0	14.0	
	Open Learning Space	60	2-6	1	130.0	130.0	
	Maker Creative Space	(Varies)	(Varies)	1	39.0	39.0	
	Lounge, Reading Area	15-20	-	1	45.0	45.0	
	Study Rooms	3-5	-	2	8.0	16.0	
	Fiction Collection	-	-	1	70.0	70.0	
	Non-Fiction Collection	-	-	1	70.0	70.0	
	Technology Zone	(Varies)	(Varies)	1	34.0	34.0	
	Librarian Workspace / Cataloging Office	-	2-4	1	10.0	10.0	
	Display	-	-	1	-	-	Refer to PART 2 of this document.
TOTAL Library Learning Commons						428.0 NSM	

3.2 Administration, Health, Counselling, and International Education

3.2.1.1 Description

3.2.1.1 (1) This component is comprised of three (3) separate functioning departments, which work closely with one another: Administration, Health, Counselling, and International Education. Although they have separate functions, the Counselling component and International Education is considered as one suite. This area requires direct adjacency to the Administration, Health although they will be designed as separate functioning suites with their own separate circulation gross. Refer to Table 5.

3.2.1.1 (2) The Administration department is the home base for the School Principal, two (2) Vice Principals, their support staff, and the School reception. School administrative activities such as accounting/financial, and human resource functions occur in this department. In addition, a School First Aid Room is in this component.

3.2.1.1 (3) All teachers use the Mailboxes area to retrieve their mail daily. As a result, the mailbox area is a loud and high traffic area.

3.2.1.1 (4) The Counselling department is comprised of school counselors, and other itinerant support professionals (i.e. Indigenous Officer, Police - Student Liaison Officer, School Aged Childhood and Youth and Settlement Workers in Schools). The main user groups for this department are the School students and their families. Some students may also use the 'Waiting Area/ Student Work Area' of the student services to gather information on the career brochure board or use this space as a quiet space to collect their thoughts or calm down.

3.2.1.1 (5) The International Education department supports international students and their families. This space will be used for teaching as well as a meeting space for visiting family members of international students.

3.2.1.1 (6) The Staff Room is used for gatherings and meals by staff at breaks and lunch hour. Although the area for the Staff Room is derived from this department, its location will not be adjacent or near the Administration suite. The placement of the Staff Room will be such that access to it is not visible from the Administration suite.

3.2.1.2 Direction

3.2.1.2 (1) The Administration department will be a check-in point for visitors and students and will have a highly visible identity within the main entrance of the School to enable easy wayfinding for visitors. In addition, the 'Waiting and Reception Area' will accommodate the workstation for the receptionist.

3.2.1.2 (2) The Student Services space will also have easy wayfinding, however, a predominant presence in the main entrance is not desirable. The entrance into this department will be more discreet than that of the Administration. Some students will appreciate a more discreet entrance depending on their circumstances (e.g. counselling sessions). For this reason, there will be no direct visibility into the 'Waiting Area – Counselling and International Education' from the corridor. There will be two (2) entries into the

Counselling suite with one (1) being discreet and away from public areas and corridors.

3.2.1.2 (3) In addition, the Counselling suite will be separated from the Administration suite by a door with no glazing.

3.2.1.2 (4) Administrative areas will be locked afterhours with keyed entry to the space for staff members.

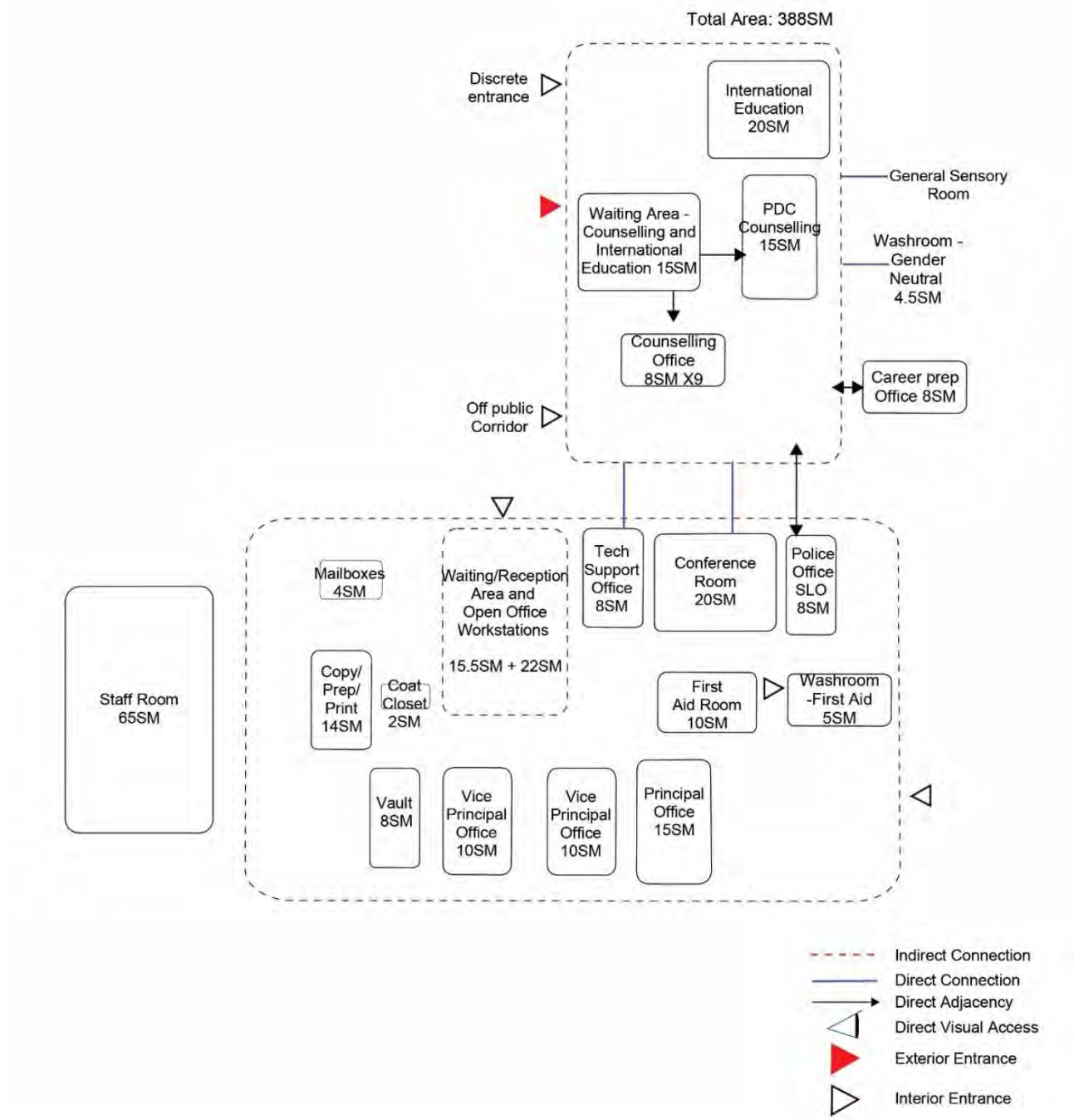
3.2.1.3 Location and Adjacencies

3.2.1.3 (1) The Administration, Health, Counselling, and International Education areas will be located on the main entrance level of the school, in a visible area which is easy to access. They will be in close proximity to the main entrance and the School Commons. There will be glazing into the Administration reception area.

3.2.1.3 (2) Daylighting and visual access to the exterior from the Administration offices including the open work area, all Counselling Offices and International Education room is required.

3.2.1.3 (3) Speech privacy in the Principal's Office, the Vice-Principals' offices, the Police Office - SLO, International Education, and all Counselling offices is required due to the sensitive nature of meetings that may occur in these spaces.

3.2.1.3 (4) Secured documents are stored in the Vault and quick access to this area from the "Open Office Workstations' is required. However, the Vault will be located such that the public cannot access this secured area easily.



Area and Adjacency Diagram 1: Administration, Health, Counselling, & International Education

3.2.2 Internal Adjacencies - Additional Remarks – Administration, Health, Counselling, and International Education

3.2.2.1 The Counselling suite and the Administration suite will be able to function separately but have direct adjacency to each other.

3.2.2.2 The Staff Room will not be located near the Administration suite. It will be a minimum of 60 metres away with no visual connection from the Administration suite.

3.2.2.3 The Career Prep Office is not part of the Administration or Counselling suites, although it will require a direct connection, and it is accessed from the public corridor.

3.2.2.4 The Copy/Prep/Print room will be accessible from both the main public corridor and from the Administration suite.

3.2.2.5 There are several entrances into the Administration and Counselling areas; these include:

3.2.2.5 (1) entrance to Administration suite from public corridor.

3.2.2.5 (2) entrance to Counselling suite from public corridor.

3.2.2.5 (3) discreet entrance to Counselling suite from public corridor.

3.2.2.5 (4) discreet entrance to Counselling suite from exterior of the School.

Table 5 – Administration, Health, Counselling, and International Education Department Area Breakdown

02	Administration/Health, International Education and Counselling	# of Students	# of Staff/ Teachers	Quantity	Minimum NSM	Minimum Total NSM	Notes:
	Administration/Health						
	Principal Office	5	1	1	15.0	15.0	
	Vice-Principal Office	5	1	2	10.0	20.0	
	Open Office Workstations	-	4	4	5.5	22.0	
	Police Office-SLO	-	1	1	8.0	8.0	
	First Aid Room	2	-	1	10.0	10.0	
	Washroom- First Aid	-	-	1	5.0	5.0	
	Technology Support Office	-	1	1	8.0	8.0	
	Copy/Prep/Print Room	-	1-2	1	14.0	14.0	
	Mailboxes	-	-	110	-	4.0	
	Vault	-	-	1	8.0	8.0	
	Staff Room	-	(Varies)	1	65.0	65.0	
	Coat Closet	-	-	1	2.0	2.0	
	Conference Room	-	12	1	20.0	20.0	
	Waiting and Reception Area	6	1	1	15.5	15.5	
	Career Prep Office	-	1	1	8.0	8.0	
Subtotal, Administration/Health						224.5	
	Counselling and International Education	# of Students	# of Staff/ Teachers	Quantity	Minimum NSM	Minimum Total NSM	Notes:
	Waiting Area – Counselling and International Education	10	-	1	15.0	15.0	
	PDC- Counselling	-	(5-6)	1	15.0	15.0	Refer to PART 2 of this document.
	Counseling Office	-	1-3	9	8.0	72.0	
	International Education	12	1	1	20.0	20.0	Lockable file storage
Subtotal, Student Services						122.0	
Administration and Counselling Suites Gross up						41.5	
TOTAL Administration/Health, International Education and Counselling						388.0 NSM	

3.3 MULTI PURPOSE

3.3.1 Description

3.3.1.1 The Multi Purpose department consists of four (4) program spaces with the ability to connect to exterior space. Refer to Table 6.

3.3.1.2 The School Commons is one of the central spaces of the School and the social heart of the School. This component is comprised of general areas which will be used by the entire School and the community at large for special events. This space will be centrally located and acts as the confluence of the various parts of the School. It will not be located in an isolated area of the building.

3.3.1.3 Activities in the School Commons may include socializing, eating, informal learning, grade assemblies, presentations, art shows, and community rentals.

3.3.1.4 For the area allocated towards Servery and a Servery Storage spaces, refer to Schedule 1 – Statement of Requirements, Appendix 1B – School Room Data Sheets and Appendix 1G – Food Services Equipment.

3.3.2 Direction

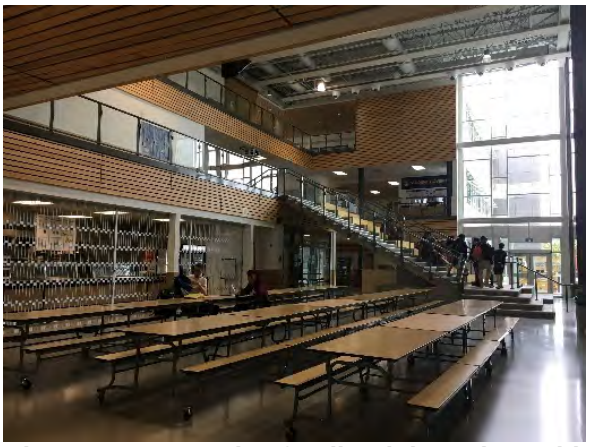
3.3.2.1 As one of its multi-purpose activities, the School Commons will serve as the eating space in the School.

3.3.2.2 Other activities, such as art shows, will be accommodated in this space and the use of flexible, foldable walls to increase wall space for hanging student work is required.

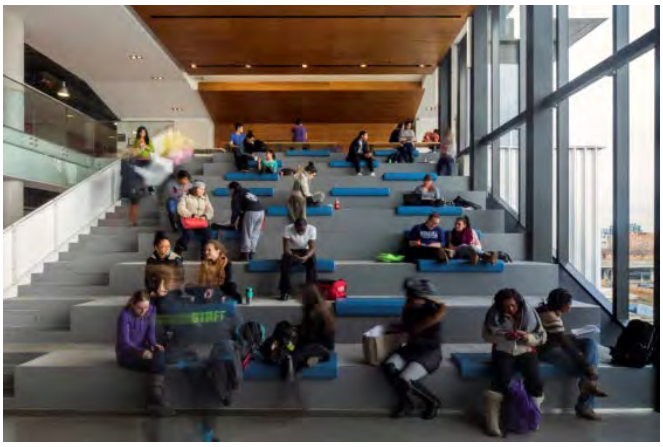
3.3.2.3 The School Commons will not have any large social stairs that take up a large majority of the space. A flat space will allow for greater flexibility and versatility. However, a feature open staircase that will join the various levels of the School will be located in direct visual access of the Multi Purpose space for both visual and physical connectivity. The feature staircase will connect a minimum of two (2) levels together to promote transparency.

3.3.2.4 The School Commons will be an atrium space connecting more than two stories to achieve a visual connection to the other levels of the School.

3.3.2.5 With the exception of the Servery and Servery Storage requirements, the School Commons is an open space that is to be open to the primary circulation spine. The programmed area allocated to the School Commons is in the NSM. However, the circulation space, which will be open to the School Commons, is not included in the NSM.



Picture 3 – Example of Full Height Atrium with Natural Light, Kitsilano Secondary School



Picture 4 – Example of Social Stairs Not to Be Used

Picture 5 – Example of Atrium Space and Feature Stair That Promotes Visual and Physical Connectivity Between the Different Levels of The School

Picture 6 – Example of Foldable Walls that Allow Display of Art for Gallery Style Art Show in School Common Space and Can Be Stored Flush with Wall

Picture 7 – Example of School Commons Spilling into Exterior Commons to Encourage Outdoor Learning

3.3.3 Location and Adjacencies

3.3.3.1 The School Commons area is the social heart of the School and will have direct connection to the main entrance and Administration, Health, Counseling and International Suite and LLC. If the LLC is not ground level, then the stair access to the LLC will be situated such that it provides direct access to the stairs.

3.3.3.2 It will provide access to other School spaces that require public access after school hours such as the gymnasiums, Drama Studio, Dance Studio, and the Music department. The Servery will have doors that open directly into or provide easy access to the Loading/Shipping Receiving area.

3.3.3.3 The School Commons needs to be a flexible space so will have the ability to accommodate a variety of seating options. An Exterior Commons is to be located adjacent to the School Commons to allow activities to spill outdoors. Direct adjacency between the Exterior Commons space and the School Commons is required.

3.3.3.4 Internal Adjacencies - Additional Remarks – Multi Purpose

3.3.3.4 (1) The Servery will be located in close proximity to the School Commons area.

3.3.3.4 (2) Vending machines will be placed in the general proximity but will not have direct adjacency to the Servery or the School Store.

3.3.3.4 (3) Capacity to spill out to adjacent Exterior Commons area for eating and learning outdoors is required from the general School Commons space.

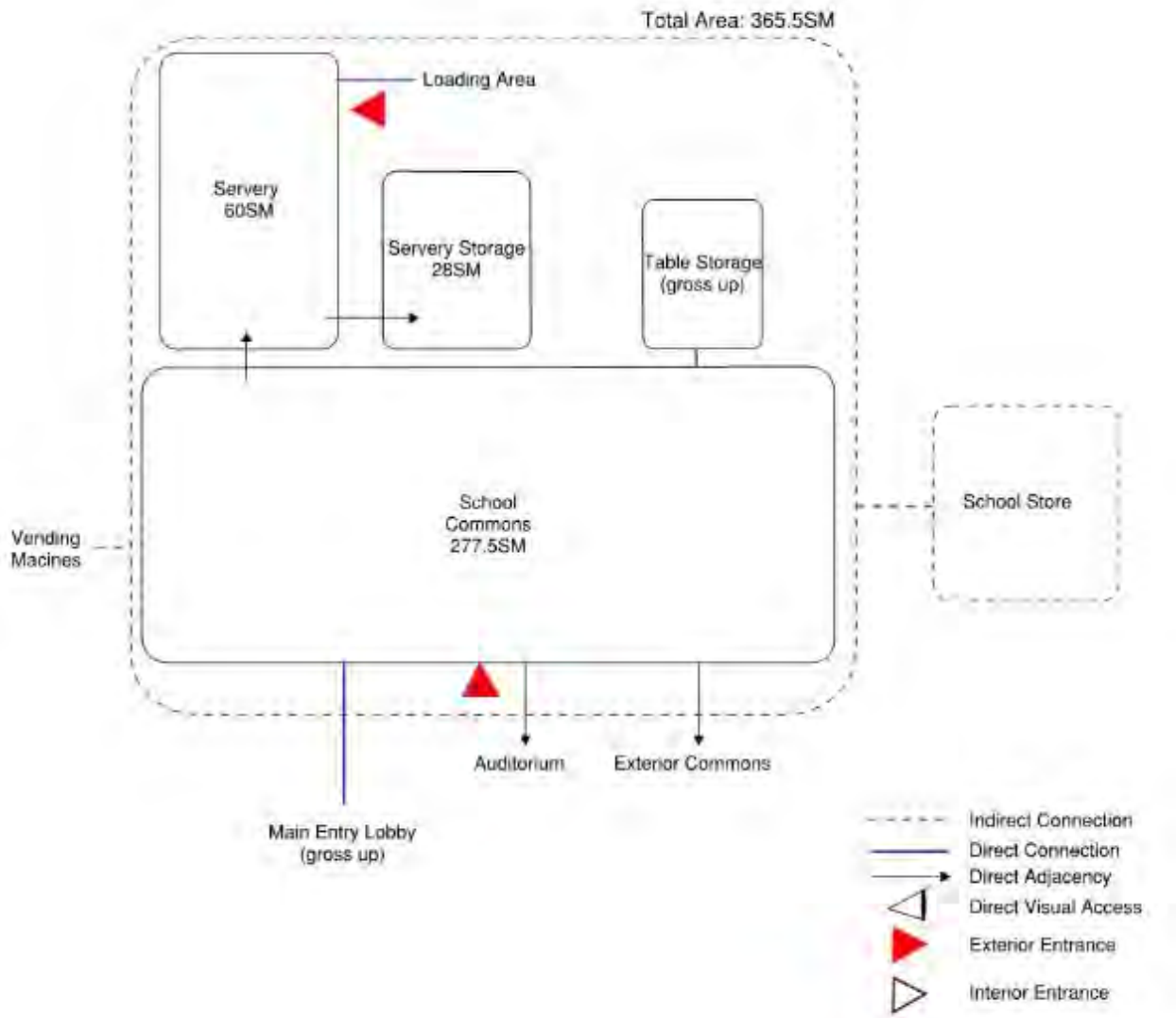
3.3.3.4 (4) Ensure visibility from Exterior Commons into adjacent spaces.

3.3.3.4 (5) Multi Purpose - School Commons will be an atrium space connecting more than two stories to the top of the School.

3.3.3.4 (6) Provide natural light opportunities at the top of the atrium to create a bright space.

3.3.3.4 (7) Public displays to be located within the main entrance area of the School Commons space. (Refer to PART 2.)

3.3.3.4 (8) Table Storage to accommodate a minimum of 20 tables is not included in the NSM.



Area and Adjacency Diagram 2: Multi Purpose

Table 6 – Multi Purpose department area breakdown and description

03	Multi Purpose	# of Students	# of Staff/ Teachers	Quantity	Minimum NSM	Minimum Total NSM	Notes:
	Student/Common Spaces						
	School Commons	(Varies)	(Varies)	1	277.5	277.5	
	Table Storage			1	(gross up)	(gross up)	
	Servery	-	1-3	1	60.0	60.0	Refer to Appendix 1G – Food Services Equipment.
	Servery Storage	-	-	1	28.0	28.0	Refer to Appendix 1G – Food Services Equipment.
	Exterior Commons	(varies)	(varies)	1	(200) exterior space	(200) exterior space	- Provide ability for the School Commons and the Exterior Commons to open with two (2) sets of glazed double doors to create seamless space for eating and socializing to spill outdoors. - Refer to Section 3.15 of this document.
TOTAL, Multi Purpose Space						365.5 NSM	

Picture 8 – Example of Informal Meeting Spaces

Picture 9 – Example of Varied Seating Options and Connections To 2-Storey Spaces in Commons, Lynnwood High School

Picture 10 – Example of Exterior View to Commons – Exterior Area for Outdoor Events

3.4 FINE ARTS

3.4.1 Description

3.4.1.1 The Fine Arts program at the School includes four (4) departments:

3.4.1.1 (1) Arts

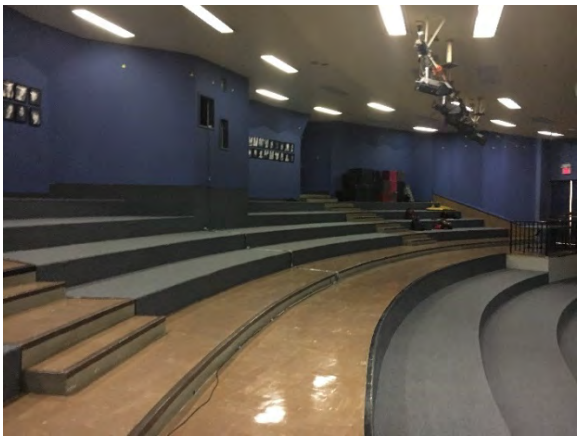
3.4.1.1 (2) Drama

3.4.1.1 (3) Dance

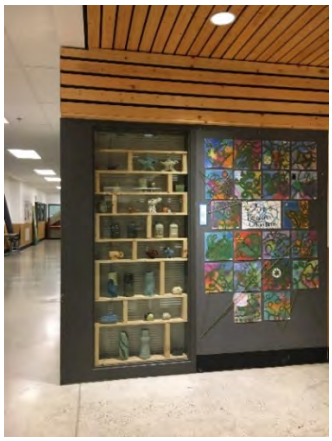
3.4.1.1 (4) Music

3.4.2 Direction

3.4.2.1 The Fine Arts program will continue being a hands-on program. Digital creative processes are expected to play a larger role in the future requiring collaboration with other spaces in the School such as the MAC Lab. There is the possibility the Owner will offer a future film and recording arts program.



Picture 11 – Example of Existing Tiered Drama Classroom



Picture 12 – Example of Creative Use of Shelving for Artwork/Ceramics, Kitsilano Secondary School

Picture 13 – Example of Sprung Floor Dance Studio with Clerestory for Daylighting

3.4.3 Location and Adjacencies

3.4.3.1 Fine Arts encompasses a diverse range of programs and there is no requirement to have adjacencies between all four (4) departments. Only adjacencies within each department are required. Refer to Appendix 1J – Auditorium Specifications for additional information.

3.4.3.2 Due to the public nature of the Music, Dance, and Drama departments, easy wayfinding to each of these spaces is required. Events may include after school hours drama productions, music room rentals by external groups, after school clubs and programs, rehearsals, and dance performances.

3.4.3.3 The Art program does not require direct access from the main School entrance and can be located on the upper floors. Art shows will take place in the School Commons and the School Commons space will be configurable to accommodate this.

3.4.3.4 Art

3.4.3.4 (1) Within the Arts department, direct adjacencies are critical due to sharing of spaces and teachers. The visual art spaces and the graphic art spaces will have direct access to each other. An Art PDC will be located with direct access to the Art Studios. As there are synergies with the Yearbook and MAC Lab, these spaces will have direct access to the Graphic Arts and Photography Lab. The visual arts component can be configured as one (1) large connected space. The Arts department requires glazing to the exterior and direct access to an outdoor patio space where students can spill out and complete sketching or painting outside. Provide two sets of double doors at a minimum to the outdoor patio.

3.4.3.5 Drama

3.4.3.5 (1) The various components that make up the Drama department will have direct access to each other. The Drama Studio is where classes take place and where small performances will occur. The Sound/Lighting Booth will be an accessible enclosed room.

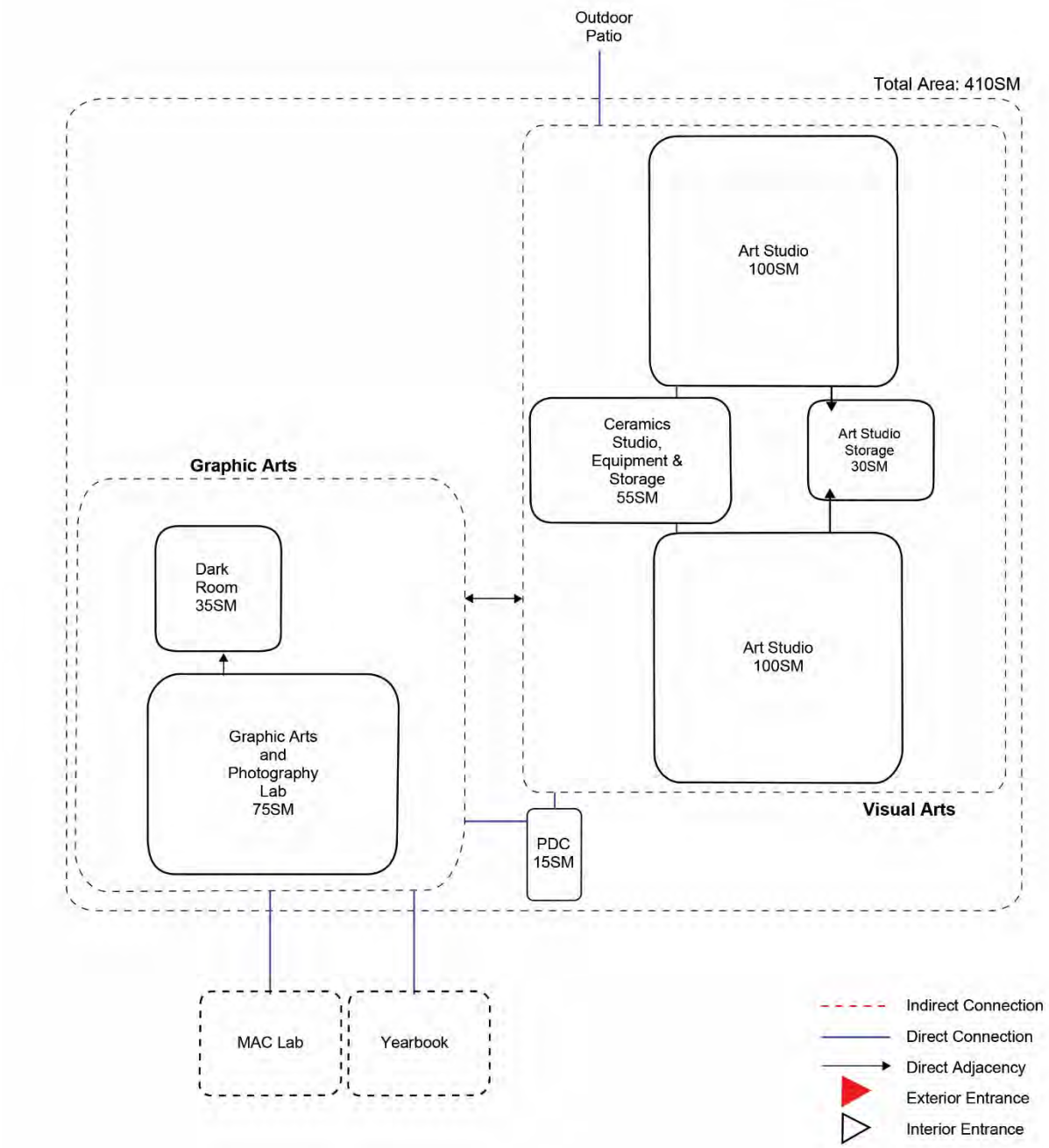
3.4.3.5 (2) Refer to Appendix 1J – Auditorium Specifications.

3.4.3.6 Dance

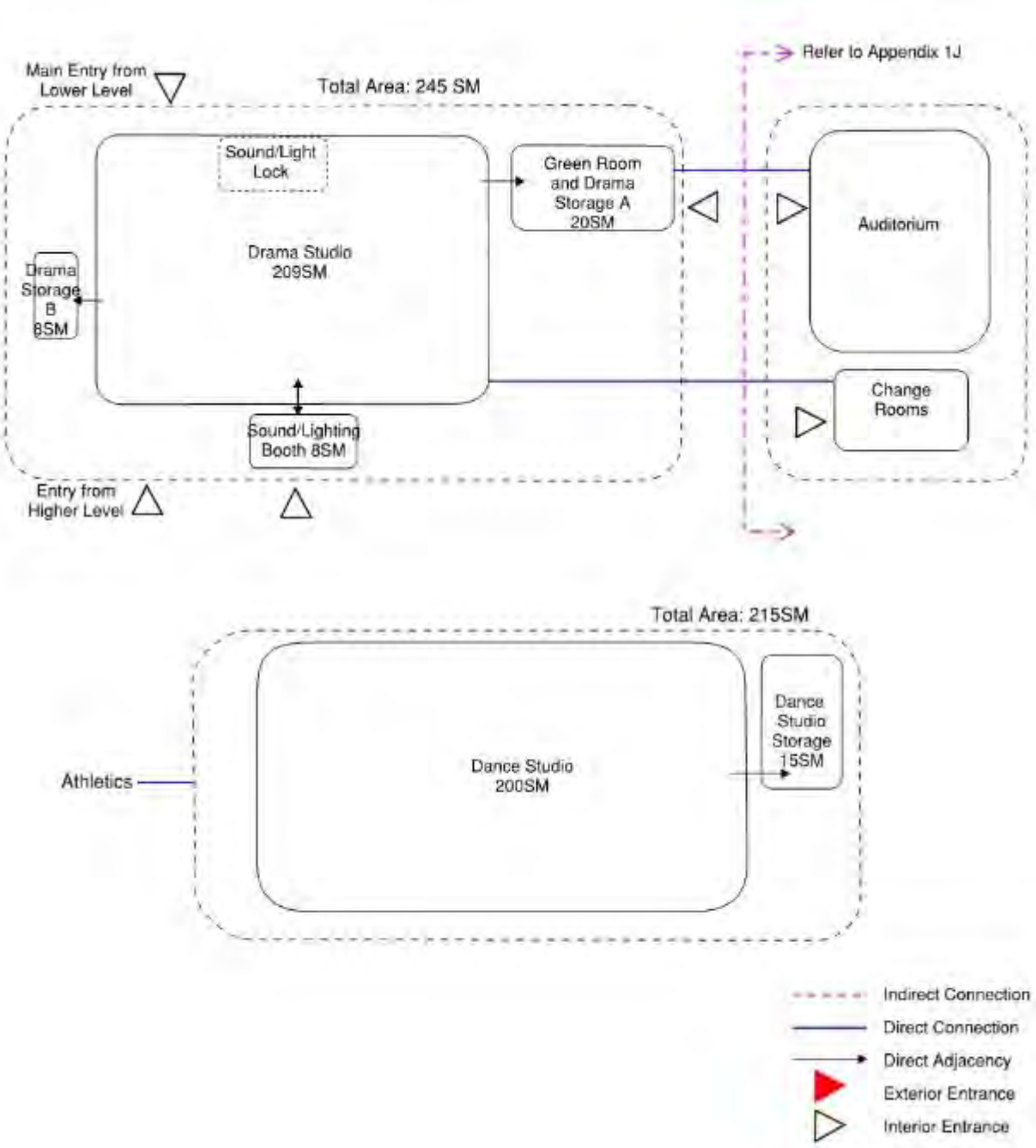
3.4.3.6 (1) The Dance Studio is largely one (1) space with a separated storage area adjacent to it. This space can be fairly loud and if noise sensitive programs are located nearby, appropriate acoustic treatment will be incorporated. Refer to Appendix 1C – Acoustic and Noise Control Ratings. In the future, there may be pairing of programs between the Athletics program and the Dance Studio and convenient access will be provided.

3.4.3.7 Music

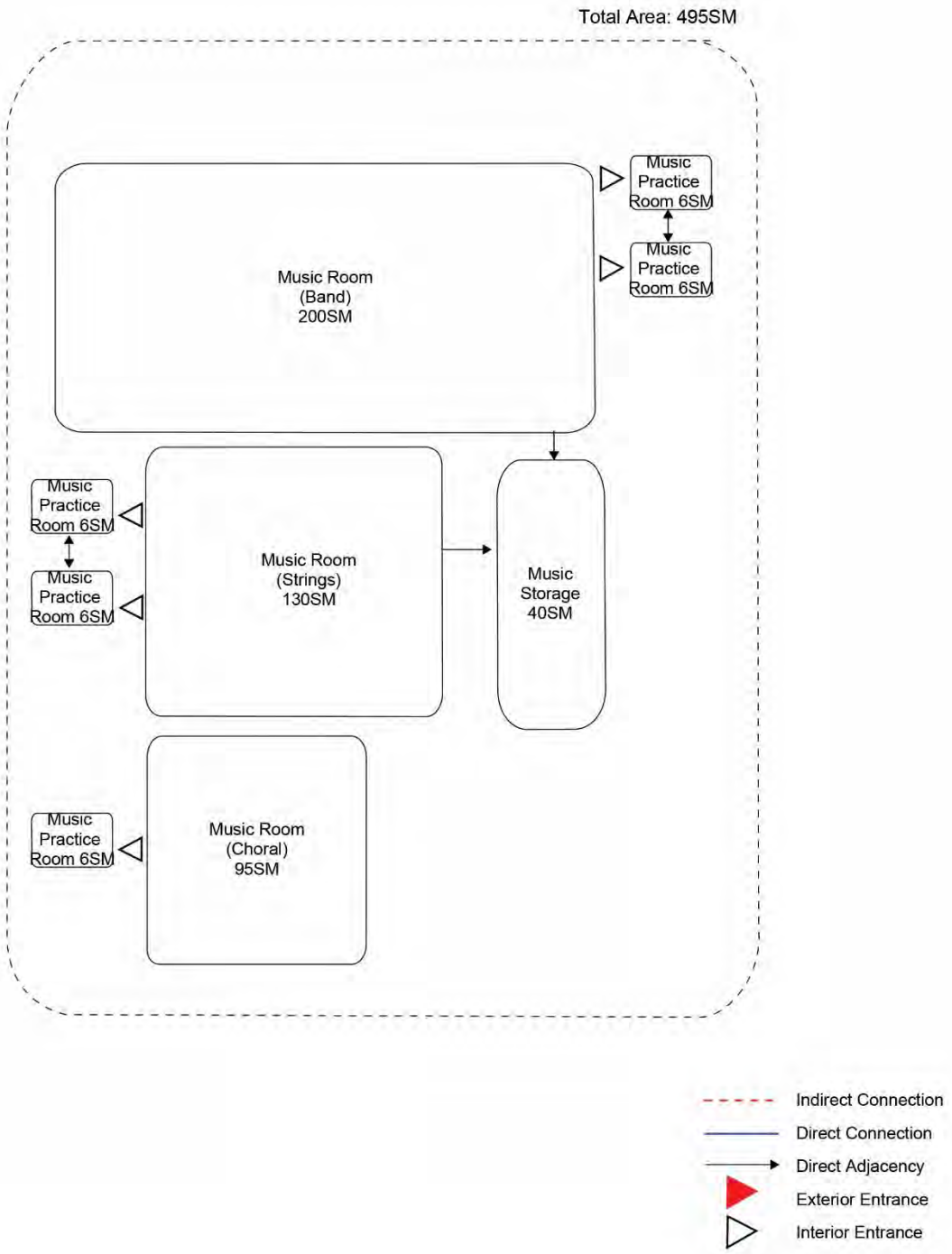
3.4.3.7 (1) Music components are required to be within direct access of each other.



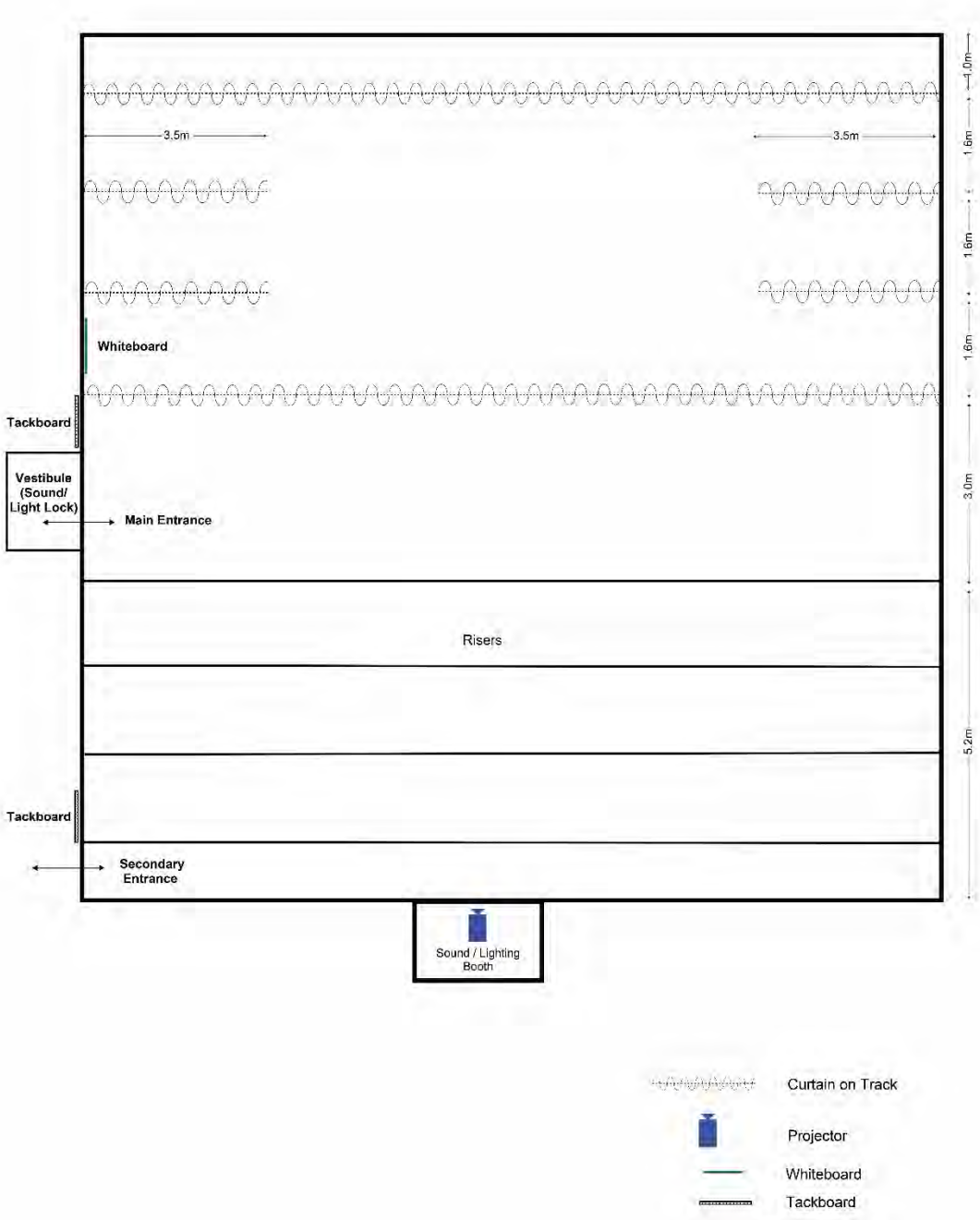
Area and Adjacency Diagram 3: Arts



Area and Adjacency Diagram 4: Drama & Dance



Area and Adjacency Diagram 5: Music



Typology Diagram 1: Drama Studio

Table 7 – Fine Arts department area breakdown and description

04	FINE ARTS	# of Students	# of Staff/ Teachers	Quantity	Minimum NSM	Minimum Total NSM	Notes:
	Art Studio	30	1-3	2	100.0	200.0	
	Art Studio Storage	-	-	1	30.0	30.0	
	Ceramic Studio, Equipment & Storage	4	1	1	55.0	55.0	
	Graphic Arts and Photography Lab			1	75.0	75.0	
	Dark Room			1	35.0	35.0	
	PDC – Arts	-	1-2	1	15.0	15.0	Refer to PART 2 of this document.
	Art Outdoor Space				(gross up)	(gross up)	
Subtotal, Arts						410.0 NSM	
	Dance Studio			1	200.0	200.0	
	Dance Studio Storage			1	15.0	15.0	
Subtotal, Dance						215.0 NSM	
	Drama Studio		1-2	1	209.0	209.0	
	Changeroom			0	0	0	
	Green Room and Drama Storage A	(Varies)	(Varies)	1	20.0	20.0	
	Drama Storage B			1	8.0	8.0	
	Sound/Lighting Booth	-	-	1	8.0	8.0	
Subtotal, Drama						245.0 NSM	
	Music Room (Band)	Up to 80	1-2	1	200.0	200.0	
	Music Room (Strings)			1	130.0	130.0	
	Music Storage			1	40.0	40.0	
	Music Room (Choral)	Up to 80-	1-2	1	95.0	95.0	
	Music Practice Rooms	1-3		5	6.0	30.0	
Subtotal, Music						495.0 NSM	
TOTAL, Fine Arts						1365.0 NSM	

3.5 ATHLETICS

3.5.1 Description

3.5.1.1 The Athletics program at the School is a robust program that offers six (6) classes simultaneously during each block of the School day. The Athletics program at the School is an essential component of the after-school program and it brings the external School community from alumni, parents, visiting schools and the community together. The School (partially due to the existing field, gym, and facilities) is the site of many provincial tournaments and championships that bring in visiting teams from all over the province. The Athletics program brings together School spirit and their ability to support a diverse and large program is a source of great School pride and a large part of the School's identity.

3.5.1.2 In the Athletics program, students participate in sports education such as basketball, volleyball, badminton, tennis, track and field, gymnastics, field hockey, wrestling, weight training, yoga, and soccer, among others. Additionally, training, education and instruction on health is taught in the Weight Room and Health & Fitness Studio.

3.5.2 Direction

3.5.2.1 The School will continue to offer Athletics classes at 100% utilization and will require both indoor and outdoor spaces to continue doing so. The Athletics program will continue growing as interests of students diversify. Storage for future athletic teams, whether they are playing on School property or off School property (such as ice hockey), needs to be considered to allow for expansion of the Athletics program.

3.5.2.2 The gymnasium is currently available for public rentals and will continue to be so in the future.

3.5.3 Location and Adjacencies

3.5.3.1 The Gymnasiums will be comprised of a Gymnasium Large 32.6 metres x 24.2 metres (minimum wall to wall clear) and a Gymnasium Small of approximately 19 metres x 30 metres (minimum wall to wall clear).

3.5.3.2 The Gymnasium Large will be divided equally into two (2) with a rigid divider that will fold away into a pocket space (beyond the clear gymnasium dimensions). Each partitioned area of the Gymnasium Large will be able to accommodate two (2) different groups using the space (i.e. four (4) separate groups will be able to use the Gymnasium Large at one time).

3.5.3.3 The Gymnasium Small will be divided equally by a vertical lift partition heavy duty curtain.

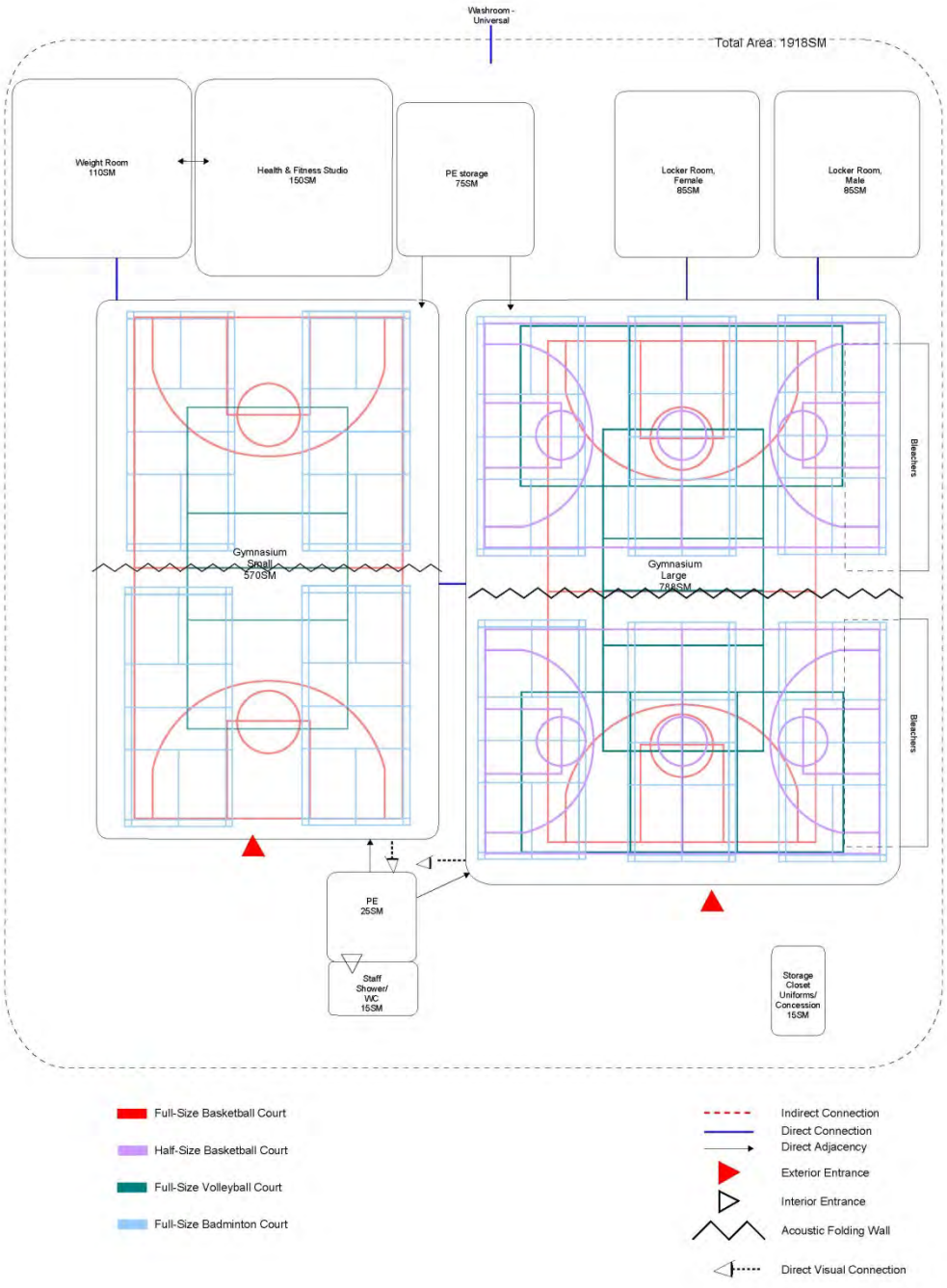
3.5.3.4 The two (2) Gymnasiums can be physically adjacent to each other or not physically adjacent but within direct connection to each other.

3.5.3.5 The Gymnasium Large dimensions allow for one (1) full-sized basketball court to fit into the 32.6 metres x 24.2 metres space. The full-size basketball court shall be 28 metres x 15 metres clear to the inside of the perimeter lines, with minimum 1.83 metre base line run-offs. Pull out bleacher seating will be provided along one (1)

side. (The final location is to be confirmed with the Owner during the Design Development Phase).

These bleachers will accommodate a minimum capacity of 300 people. When pushed away, the gymnasium dimensions will not be compromised. However, when pulled out, the bleachers can

impede upon the gymnasium floor provided they do not impede upon the volleyball court lines.



(Refer to

3.5.3.6 Area and Adjacency Diagram 6.)

3.5.3.7 Bleacher seating will be used for viewing games and at lunch hour by students to hang out and socialize.

3.5.3.8 Public access to bleachers will be on the same wall to avoid cross court access.

3.5.3.9 Half lockers in the change room can be stacked but will have alternating access in order to provide sufficient space for student access. Upper stacked lockers are accessed from one (1) side, while the lower stacked lockers are accessed from the opposite side. With the exception of perimeter lockers, half height lockers will be provided.

Picture 14 – Example of Folding Bleachers, Kitsilano Secondary School

3.5.4 Internal Adjacencies - Additional Remarks – ATHLETICS

3.5.4.1 Ensure display cases are placed adjacent to the gymnasiums in a high-traffic, public area to showcase achievements.

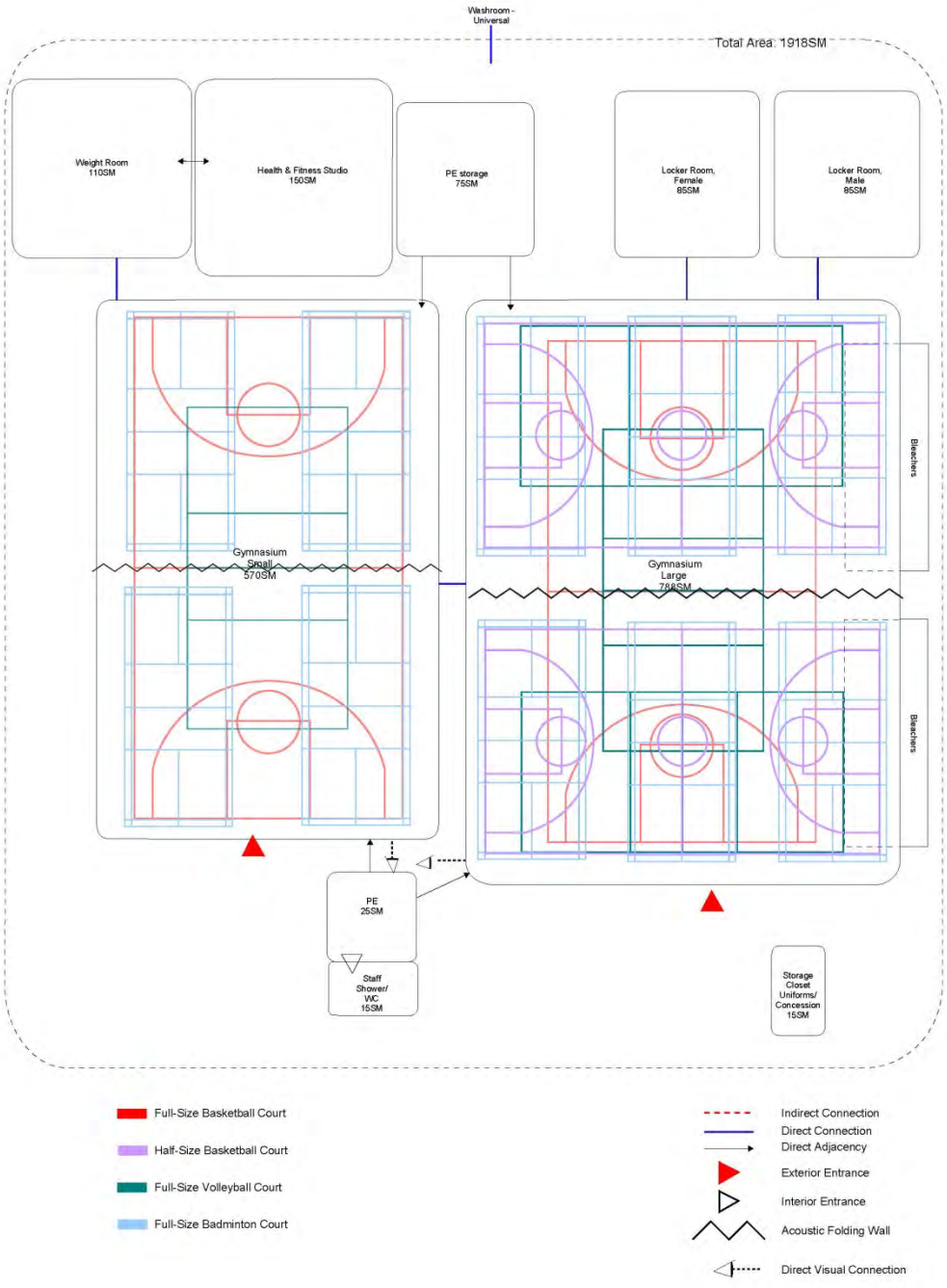
3.5.4.2 The Health & Fitness Studio will have direct adjacency to the Weight Room so those spaces can open up to each other either through a garage door or folding doors.

3.5.4.3 Although these spaces are located within the Athletics Department, both the Health & Fitness Studio and the Weight Room will be accessible through the public corridor, so they can be used by the rest of the School without having to go through gymnasium space.

3.5.4.4 Locate the Washroom-Gender Neutral (required by VBBL) in direct connection to the Athletics Department to act as a change room for students who do not identify as either female or male.

3.5.4.5 The Storage Closet Team Uniforms/ Concessions will open up to the Primary Corridor and not the gymnasiums to avoid line ups inside gymnasium space.

3.5.4.6 Gymnasium line painting and School logo will be confirmed with the Owner.


Washroom - Universal
Total Area: 1918SM
Weight Room 110SM
Health & Fitness Studio 150SM
PE storage 75SM
Locker Room, Female 85SM
Locker Room, Male 85SM
Bleachers
Gymnasium Small 570SM
Gymnasium Large 786SM
Bleachers
PE 25SM
Staff Shower/ WC 15SM
Storage Closet Uniforms/ Concession 15SM
Full-Size Basketball Court
Half-Size Basketball Court
Full-Size Volleyball Court
Full-Size Badminton Court
Indirect Connection
Direct Connection
Direct Adjacency
Exterior Entrance
Interior Entrance
Acoustic Folding Wall
Direct Visual Connection

Area and Adjacency Diagram 6: Athletics

Table 8 – Athletics department area breakdown and description

05	ATHLETICS	# of Students	# of Staff/ Teachers	Quantity	Minimum NSM	Minimum Total NSM	Notes:
	Gymnasium Large	(Varies)	(Varies)	1	788.0	788.0	
	Gymnasium Small	(Varies)	(Varies)	1	570.0	570.0	
	Health & Fitness Studio	30	1-2	1	150.0	150.0	
	PE Storage	-	-	1	75.0	75.0	Storage may be divided into two (2) spaces
	Weight Room	30	1-2	1	110.0	110.0	
	Locker Room, Male	-	-	1	85.0	85.0	
	Locker Room, Female	-	-	1	85.0	85.0	
	PDC - PE	-	6-12	1	25.0	25.0	
	Staff Shower/WC	-	1	1	15.0	15.0	
	Storage Closet, Team Uniforms/ Concession	-	-	1	15.0	15.0	
TOTAL, Athletics						1918.0 NSM	

3.6 GENERAL INSTRUCTION

3.6.1 Description

3.6.1.1 General Instruction classrooms make up 38 classrooms at the School.

3.6.1.2 The 38 classrooms will be used by the following departments:

3.6.1.2 (1) English

3.6.1.2 (2) ELL

3.6.1.2 (3) Languages

3.6.1.2 (4) Math

3.6.1.2 (5) Social Studies

3.6.1.2 (6) Yearbook

3.6.1.3 The numbers between the uses above vary from year to year, however, there is always one (1) dedicated classroom for the Yearbook.

3.6.2 Direction

3.6.2.1 These spaces will be identical to allow for flexibility due to evolving curricula, improved technologies, and changes in student enrollment. Schedule 1 – Statement of Requirements describes the School's teaching pedagogy that will work for current and future administration and teachers of the School. To the extent possible, the location of General Instruction Classrooms will have equality in daylighting and glazing to the exterior.

3.6.2.2 Each departmental learning zone will have an associated PDC for staff collaboration and will serve as a space for hotelling and temporary staff to touch down and store personal belongings. Refer to Section 2.4 for more detail.

3.6.2.3 Access to the classrooms will have barrier-free design to accommodate accessible entry/egress. The entrance into each classroom will be located near the wall with the short-throw projector. Each short-throw projector is to be mounted centred in the room and centred to the wall with the two (2) sliding whiteboards. Ensure that there are no whiteboard seams located within the projectable area of the whiteboard. There are no requirements for permanently tiered classrooms, nor is there a requirement to provide the ability for classrooms to open up to adjacent classrooms to allow for larger presentations or lectures. Collaboration between classes is to occur in other common spaces in the School such as the School Commons.

3.6.2.4 A balance between transparency into classrooms and wall surface for teaching walls will be attained; the dimensions of interior glazing into public corridors are shown in Typology Diagram 2. The intent is to provide sufficient teaching wall space while allowing transparency into classrooms for a sense of a shared community and to evoke curiosity, conversation, and interest by providing the opportunity to put education on display.

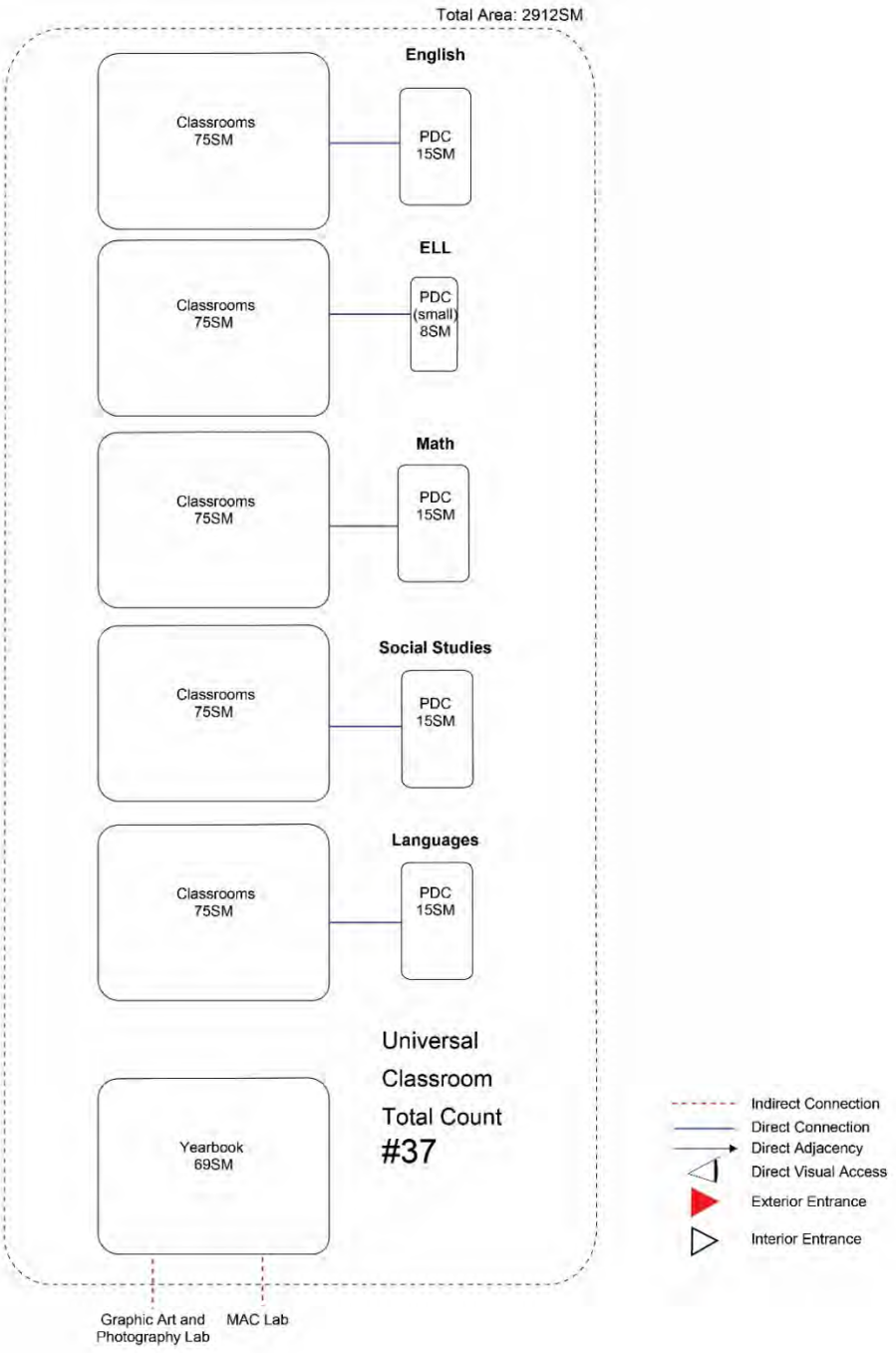
3.6.2.5 As classrooms are currently dedicated for the term and will continue to be for the near future, storage millwork is required in each of the General Instruction

Classrooms. All millwork with whiteboards or tack boards above it will be flush with the wall, so instructors and students do not need to reach over the depth of the millwork in order to reach the boards. Creative space-saving opportunities will be explored to provide these spaces. A design example in PART 2 under Lockers demonstrates how half-height lockers and shelving can be incorporated in the classrooms.

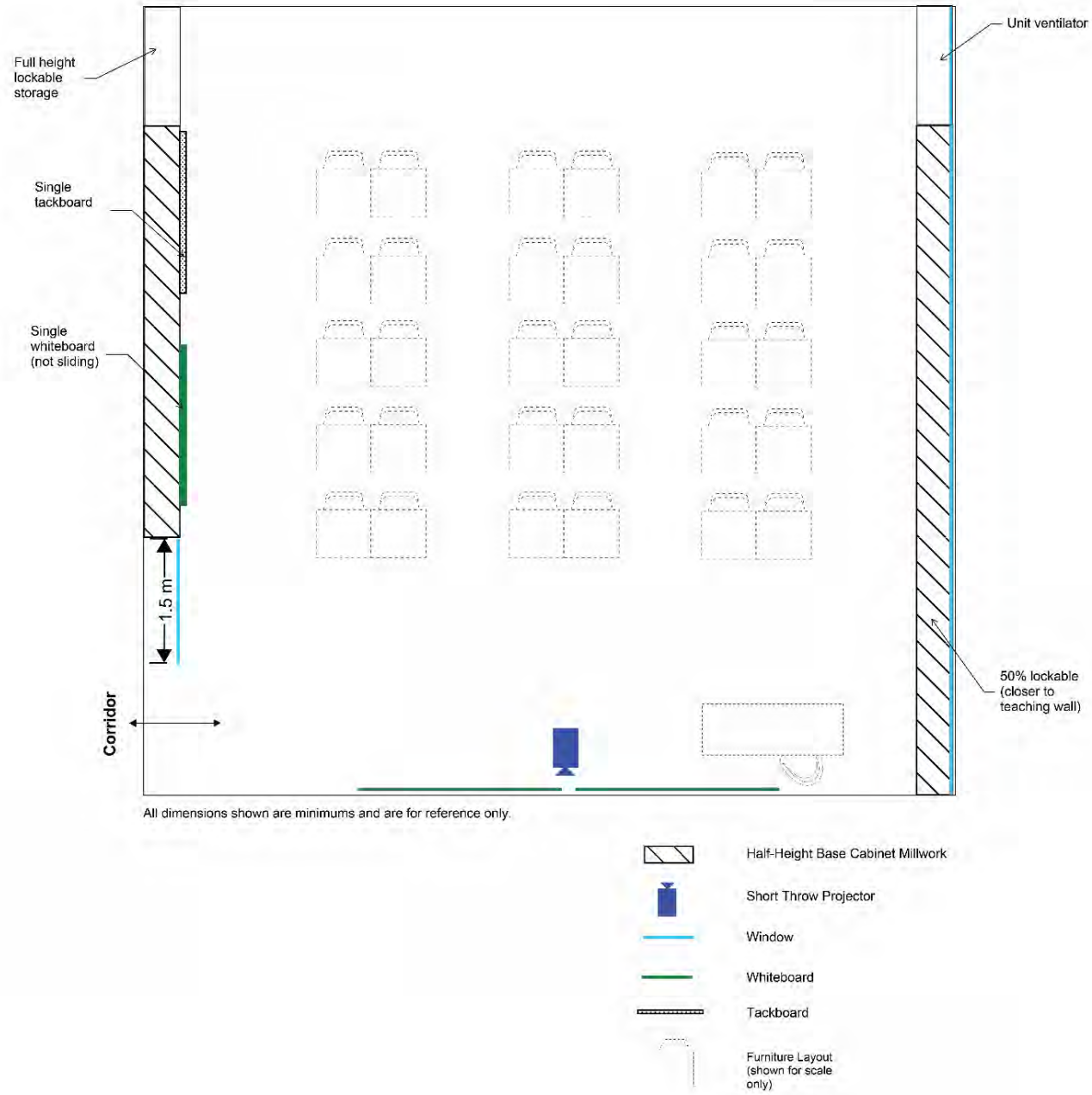
Picture 15 – Example of Visibility into Classrooms by Entryway, Note Rolling Blinds for Option of Privacy, Meadowdale Middle School

3.6.3 Location and Adjacencies

3.6.3.1 General Instruction Classrooms will not be located near any programs that create impact noise such as the Applied Skills - Industrial Education Wood Workshop and Metal Workshop. Refer to Appendix 1C - Acoustic and Noise Control Ratings for specific STC and NC.



Area and Adjacency Diagram 7: General Instruction



Typology Diagram 2: General Instruction Classroom

Note: This diagram is shown for reference only to illustrate the design intent; furniture is shown for scale only.

Table 9 – General Instruction department area breakdown and description

06	General Instruction	# of Students	# of Staff/ Teachers	Quantity	Minimum NSM	Minimum Total NSM	Notes:
	Classrooms	30	1-3	37	75.0	2775.0	
	Yearbook	21-25	1-2	1	69.0	69.0	
	PDC (medium) English, Math, Social Studies, Languages, ELL	-	1-4	4	15.0	60	Refer to PART 2 of this document.
	PDC (Small) ELL	-	1-2	1	8.0	8.0	Refer to PART 2 of this document.
TOTAL, Universal Classrooms						2912.0 NSM	

3.7 SCIENCE

3.7.1 Description

3.7.1.1 The Science program at the School includes six (6) General Science (Gr. 8-10, two (2) Chemistry, one (1) Biology, and one (1) Physics courses. Instruction for these courses includes teacher demonstration, laboratory experiments (sometimes using gas), and lectures including projected slides and group work. Storage requirements include a range of items such as reference materials, Bunsen burners, refrigerated item storage, chemical storage, and miscellaneous lab supplies/equipment. Refer to Appendix 1B – School Room Data Sheets for equipment information.

3.7.2 Direction

3.7.2.1 All General Science, Chemistry, and Biology classrooms are regarded as one typology, and providing these spaces as a module will allow for greater flexibility in the future as enrollment changes and new courses are introduced (such as the Ecology and Environment program). There are no plans to pursue a ‘super lab’ concept where classrooms and lab space are separate spaces (i.e. all lab spaces combined into one large area). The Physics Lab has unique qualities that are further described in Appendix 1B – School Room Data Sheets.

3.7.2.2 Future programming will incorporate outdoor learning as part of the science curriculum.

3.7.2.3 Universal Science Lab, Chemistry and Biology classrooms will be zoned into three (3) components with an instructor/demonstration zone, a lecture zone, and a lab zone. For the Physics Lab, there is no lab zone and, therefore, no fixed lab bench. However, a fixed teacher demonstration station will be provided near the teaching wall.

3.7.2.4 Gas hookups, electrical plugs, and sinks will be provided through the millwork benches in the lab zone. The lab bench will be fixed. Gas hookups and electrical plugs are not to be placed in the floor as this creates a tripping and cleaning hazard.

3.7.2.5 Each lab will provide one (1) ADA accessible height lab bench.

3.7.2.6 All science lab entries will be located near the teaching wall in the instructor/demonstration zone and not located near the lab zone. This reduces the chance of students breaking lab equipment as they enter and exit the lab.

3.7.2.7 Provide emergency gas shut-off switch at the entrance of all science labs.

Picture 16 – Example of Teacher Demonstration Table

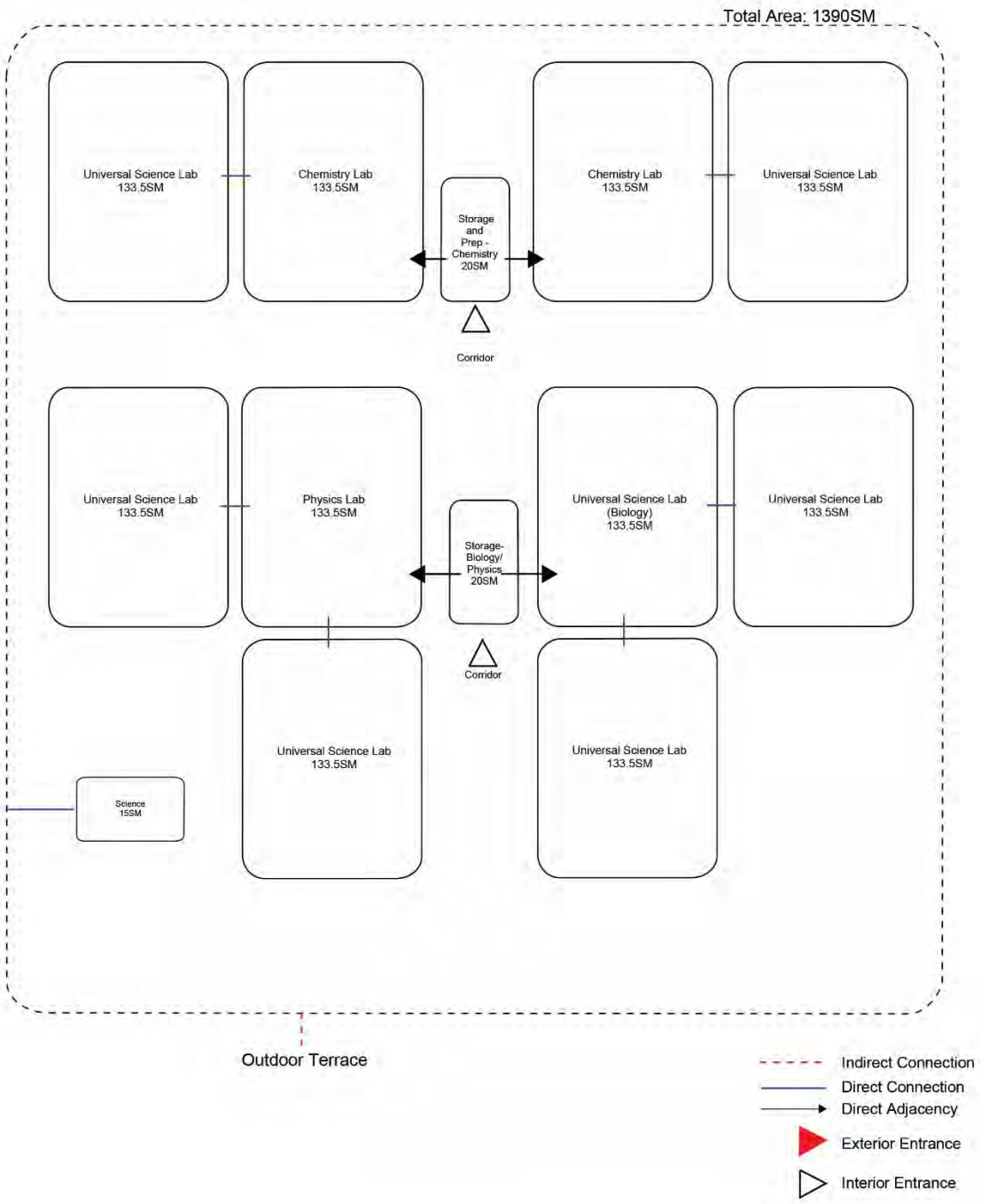
Picture 17 – Example of Science Lab Millwork, Kitsilano Secondary School

3.7.3 Location and Adjacencies

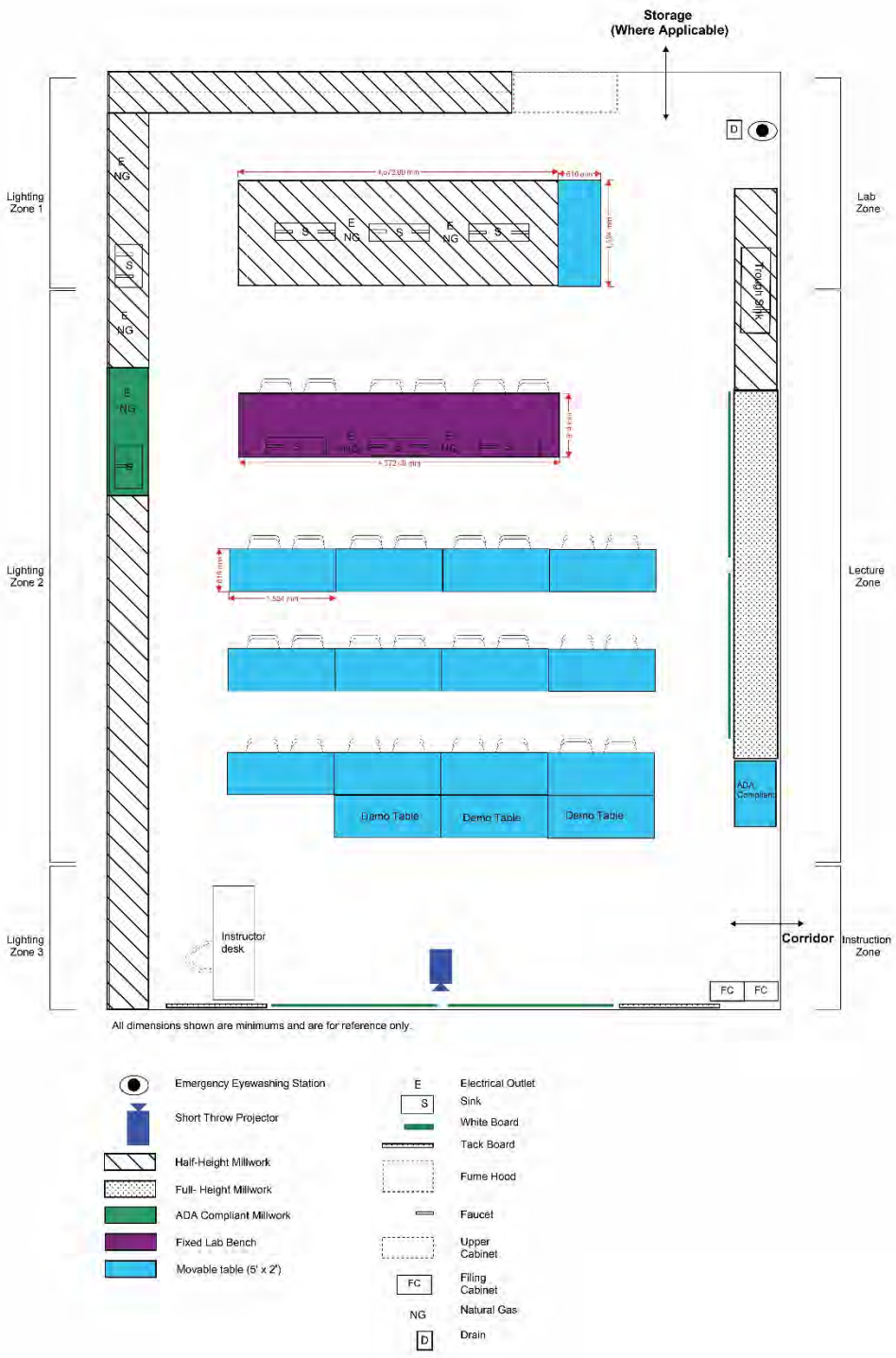
The Science Department will be organized into two (2) groupings. (Refer to

3.7.3.1 Area and Adjacency Diagram 8.) Each pairing of classrooms will share a storage area for a total of two (2) storage rooms in the department. The department will be served by one (1) PDC for teacher collaboration; this PDC can be located centrally to either grouping. Both groupings can be located on one (1) floor or separately on two (2) different floors in close proximity to each other (i.e. stacked).

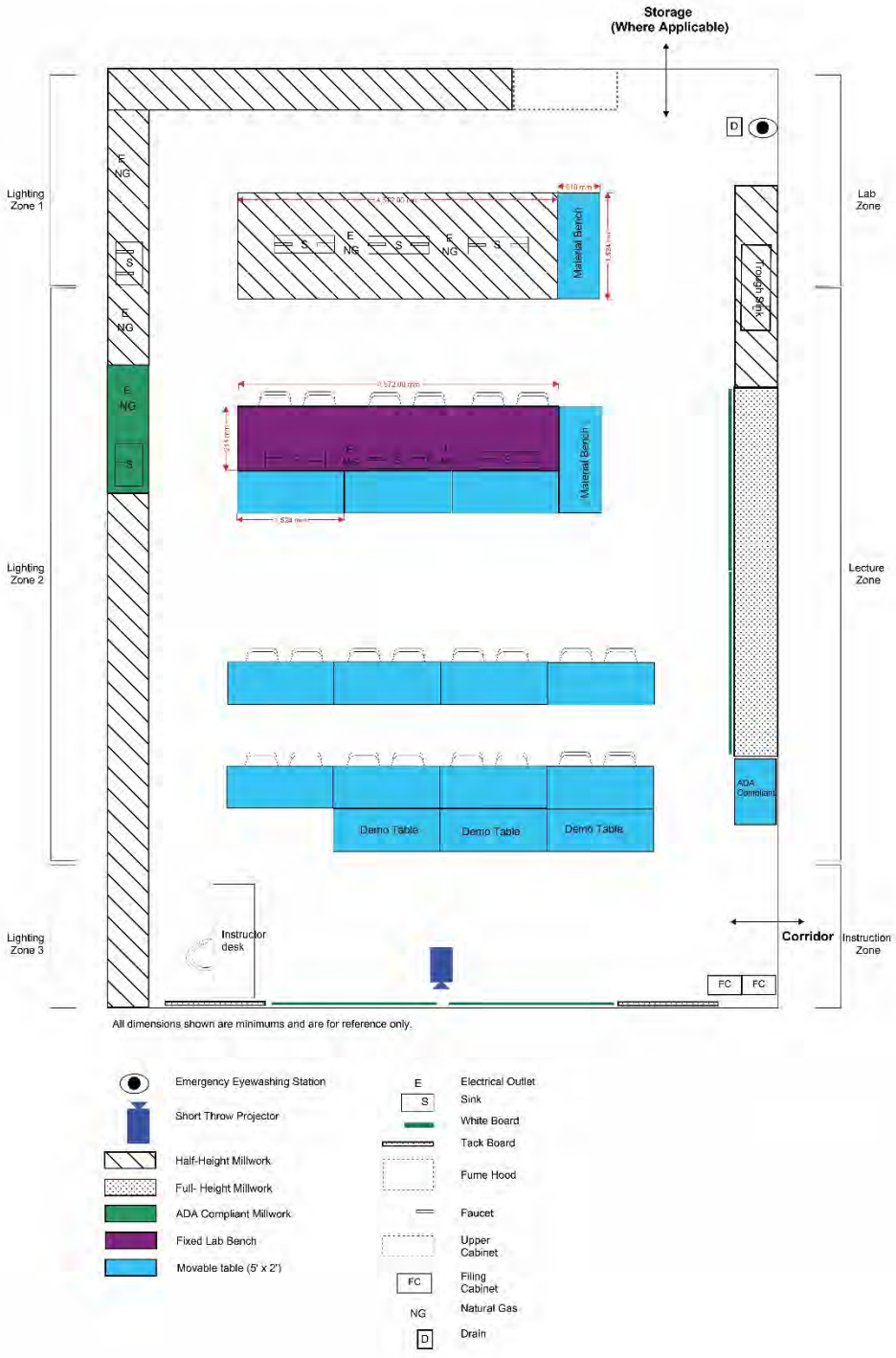
3.7.3.2 Convenient access to outdoor space is required as future curricula will incorporate more outdoor experiments and learning. This access can occur at grade provided no other component functions are disturbed by student movements to the outdoor space, and such that the path of travel does not exceed 90 metres as measured from door of laboratory to the exterior door serving the outdoor space, inclusive of horizontal and vertical path of travel.



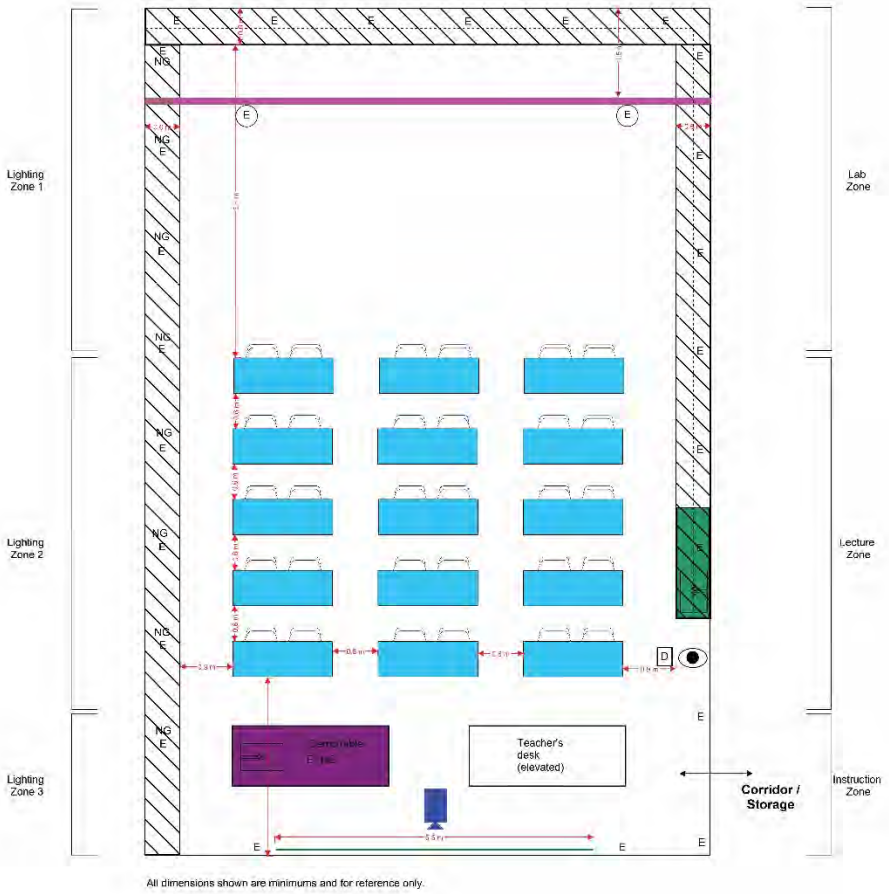
Area and Adjacency Diagram 8: Science



Typology Diagram 3: Chemistry, Biology & Universal Lab Design - Lecture Layout



Typology Diagram 4: Chemistry, Biology & Universal Lab Design - Lab Layout



Typology Diagram 5: Physics Lab

3.7.4 Internal Adjacencies - Additional Remarks – Sciences

3.7.4.1 All science storage rooms will have access from both classrooms on either side and access from the Primary Corridor.

Table 10 – Science department area breakdown and description

07	SCIENCES	# of Students	# of Staff/ Teachers	Quantity	Minimum NSM	Minimum Total NSM	Notes:
	Chemistry Lab	30	1-2	2	133.5	267.0	
	Storage and Prep-Chemistry	-	1	1	20.0	20.0	
	Storage – Biology/ Physics	-		1	20.0	20.0	
	Physics Lab	30		1	133.5	133.5	
	Universal Science Lab	30	1-2	7	133.5	934.5	
	PDC (medium)-Science	-	3-4	1	15.0	15.0	Refer to PART 2 of this document.
TOTAL, Science						1,390.0 NSM	

3.8 APPLIED SKILLS – INDUSTRIAL EDUCATION

3.8.1 Description

3.8.1.1 The Applied Skills - Industrial Education program at the School comprises of the Wood Workshop, Metal Workshop, Electronics/Robotics, and Drafting. The Wood and Metals courses will be delivered in separate shop spaces with separate storage. The Drafting and Electronics/Robotics courses will be located in their own separate learning spaces. Emphasis is predominantly on project work, and students participate in the design and manufacture of a variety of projects and processes. Students learn skills such as basic drafting and participate in the design, drafting, and manufacture of their projects.

3.8.2 Direction

3.8.2.1 In the future, the Metal Workshop will include an industrial design component and the space will accommodate jewelry making classes. This program will require small kilns and a spin caster, and the workshop will be equipped with electrical and mechanical systems to accommodate these future equipment requirements. In addition, the Robotics/Electronic program is expected to grow in the future as it is a sought-after program both during and after school hours.

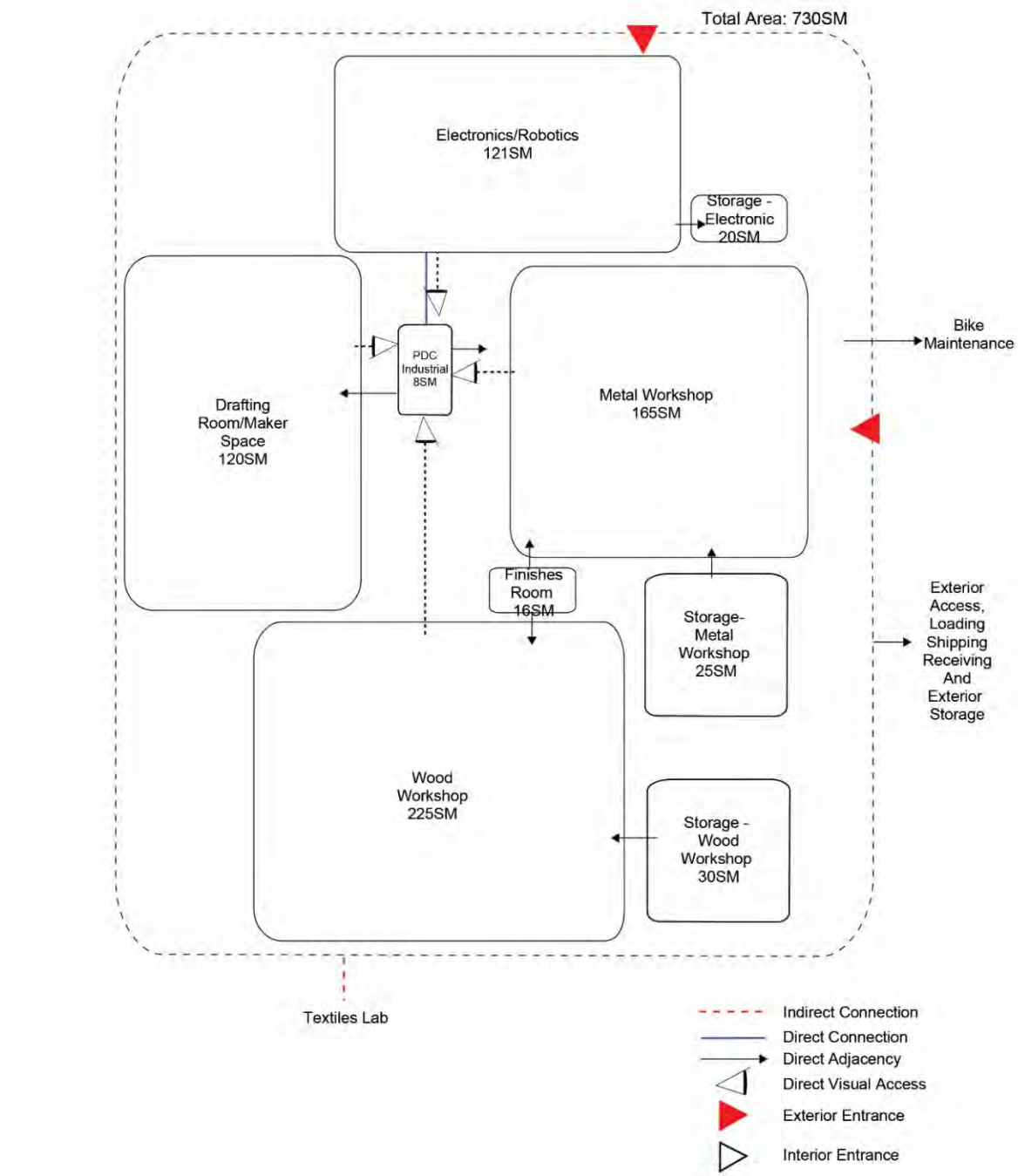
3.8.3 Location and Adjacencies

3.8.3.1 The Applied Skills - Industrial Education program is a loud space that creates both noise and vibration. There will be, at a minimum, appropriately rated walls and glazing as well as a corridor to separate this space away from programs nearby. Refer to Appendix 1C – Acoustic and Noise Control Ratings for more details. The program may also create smells and wood dust from activities such as wood-cutting, and an appropriate ventilation and dust collection system will be provided.

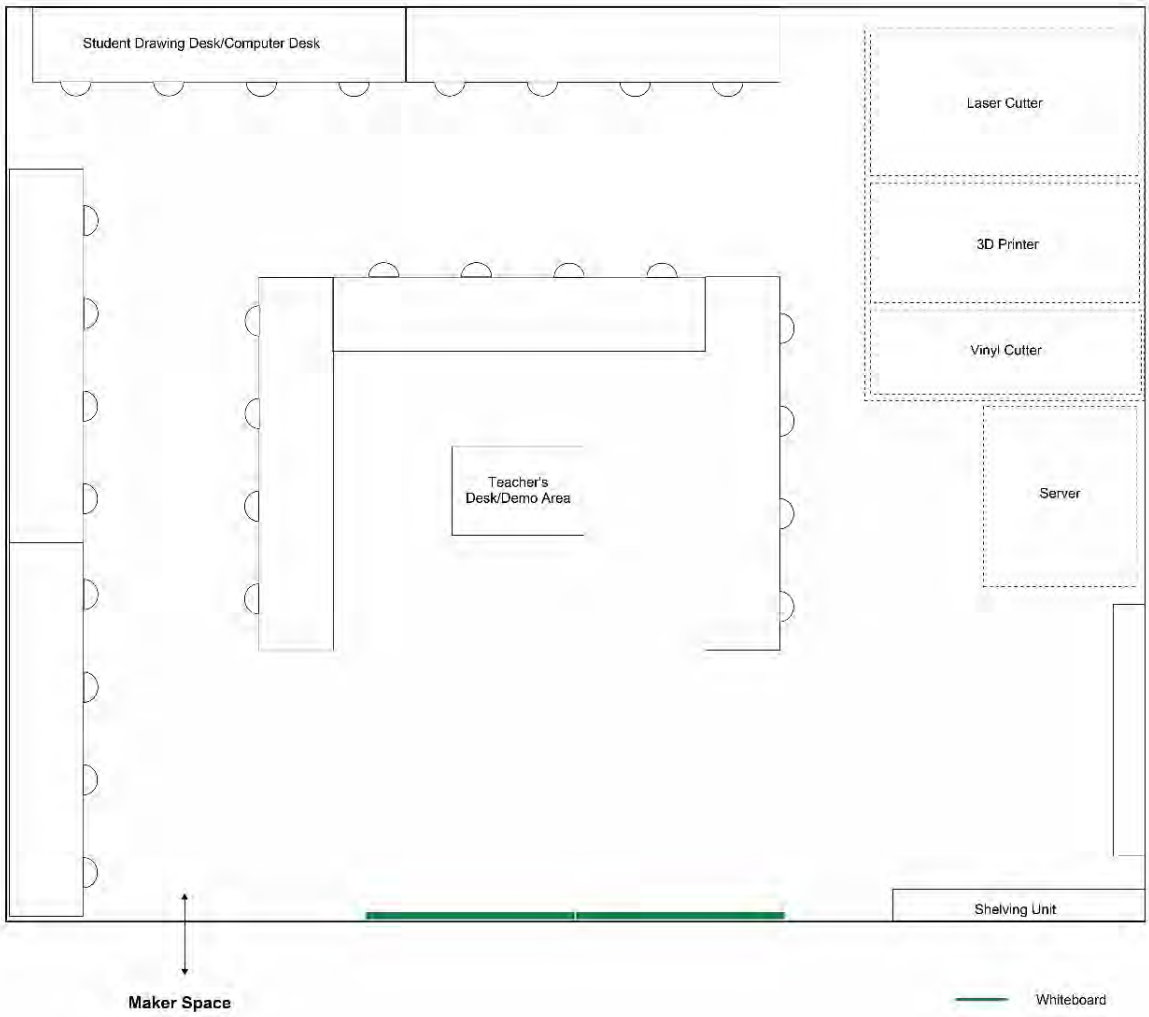
3.8.3.2 A bike maintenance area, accessible by students and staff during school hours, will be provided outside the Applied Skills - Industrial Education workshops.

3.8.3.3 Provide gas and compressed air connections in the exterior storage enclosure.

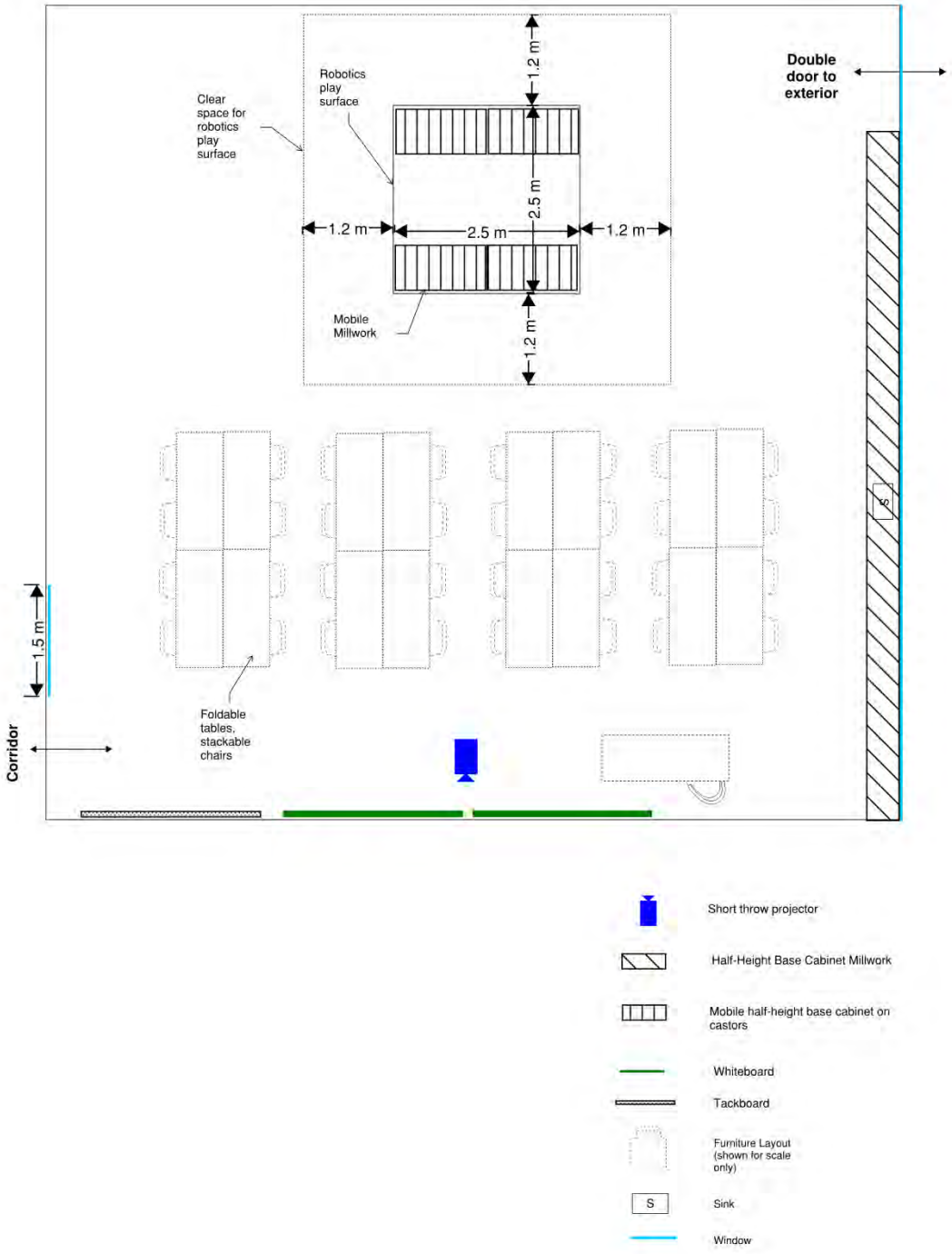
3.8.3.4 Finishes Room will be used for storage and painting with appropriate ventilation.



Area and Adjacency Diagram 9: Applied Skills - Industrial Education



Typology Diagram 6: Applied Skills - Drafting Room & Makers Space



Typology Diagram 7: Applied Skills - Robotics/Electronics

3.8.4 ternal Adjacencies - Additional Remarks – Technical Studies/Shops

3.8.4.1 Covered exterior area access required for workshops through overhead/sectional door (Robotics/Electronics, Metals, and Wood).

3.8.4.2 Outside access for loading/unloading equipment and material delivery.

3.8.4.3 Workshops will be as adaptable as possible to accommodate a wide range of curricular activities in the future.

3.8.4.4 Sightlines and clearances around machinery are very important for student safety and movement.

Table 11 – Applied Skills - Industrial Education department area breakdown and description

08	Applied Skills (Industrial Education)	# of Students	# of Staff/ Teachers	Quantity	Minimum NSM	Minimum Total NSM	Notes:
	Wood Workshop	24	1-2	1	225.0	225.0	
	Metal Workshop	24	1-2	1	165.0	165.0	
	Storage-Workshop, Wood	-	-	1	30.0	30.0	
	Storage- Workshop, Metal	-	-	1	25.0	25.0	
	Finishes Room	1-2	-	1	16.0	16.0	
	Electronics/Robotics	24	1-2	1	121.0	121.0	
	Storage- Electronic			1	20.0	20.0	
	Drafting Room and Maker Space	24	1-2	1	120.0	120.0	
	PDC (Small)-Industrial	-	3-4	1	8.0	8.0	
	Covered Exterior Area and Bike Maintenance	-	-	1	(gross up)	(gross up)	Exterior covered area, which measures a minimum of 75 NSM, with secured chain-link fence and vandalproof access from both workshops.
TOTAL Applied Skills (Industrial Education)						730.0 NSM	

3.9 APPLIED SKILLS – HOME ECONOMICS

3.9.1 Description

3.9.1.1 The Home Economics program at the School is an elective, hands-on course which introduces students to foods and textiles.

3.9.1.1 (1) In the two (2) Food Rooms, students practice food preparation in groups at a U-shaped kitchen. Instruction for Food Rooms includes the instructor providing a demonstration at the front of the class and sightlines from student stations to the front of the room will be provided. Storage needs for the Food Rooms is located in a separate, dedicated space adjacent to both Food Rooms.

3.9.1.1 (2) In the Textiles Lab, students learn to use a sewing machine to create a variety of textiles projects. Storage needs for the Textiles Lab will be provided within the space.

3.9.1.2 The Textiles program puts on a fashion show for the School community each year.

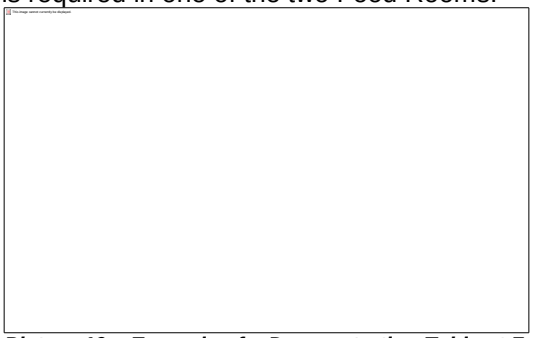
3.9.2 Direction

3.9.2.1 The Textiles Lab will have built-in flexibility to accommodate any unforeseen future uses other than Textiles in the space. The Textiles Lab will also have more in common with the Applied Skills - Industrial Education department in terms of metal work and woodwork. There will be future collaboration between Applied Skills - Industrial Education for new opportunities for applied skills and artwork. There is less of a commonality to the Foods Room, and, as a result, the Textiles Lab does not require any adjacencies to the Food Rooms. The Textiles Lab is, and will continue to be, used by after school programs such as District Fashion program.

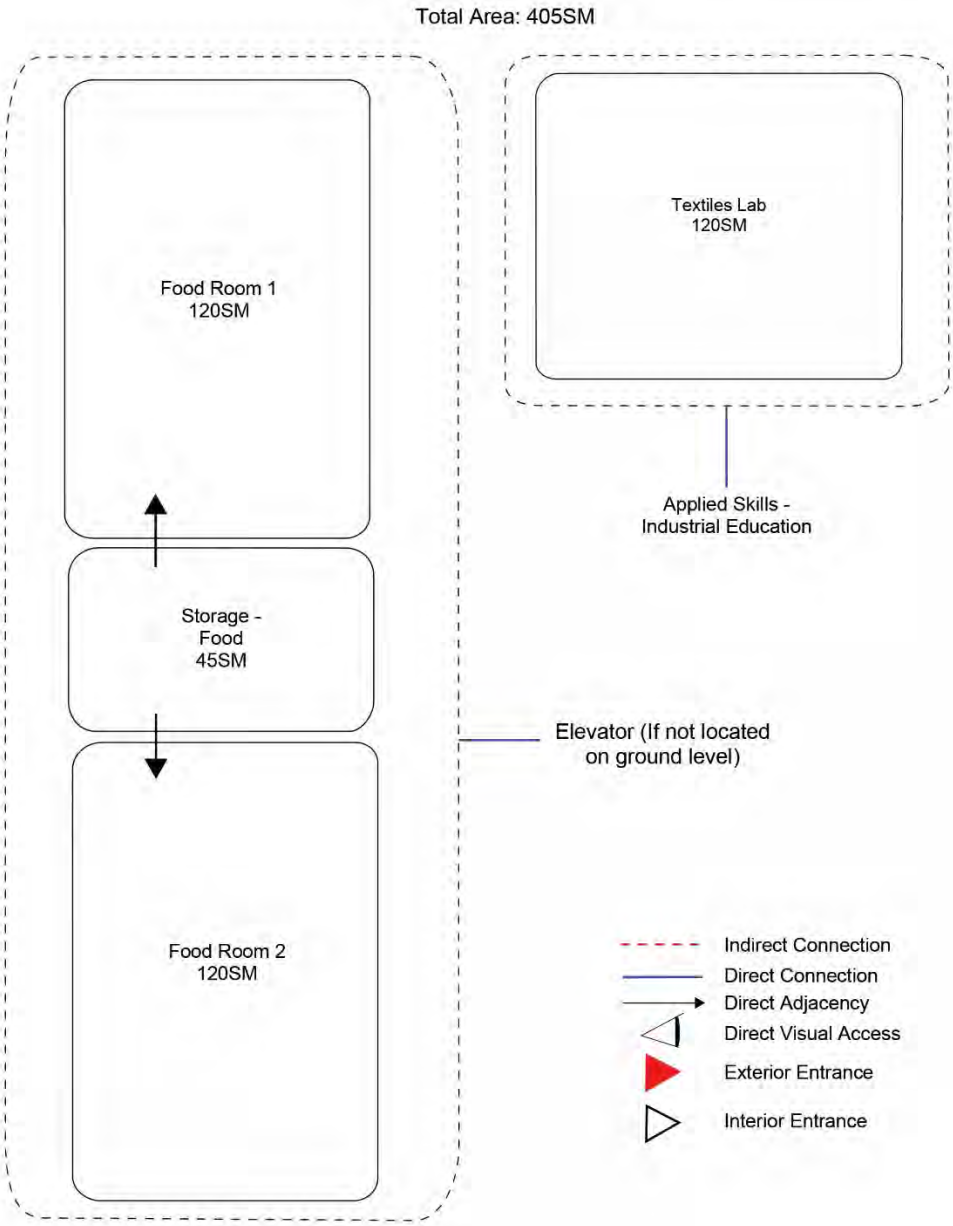
3.9.2.2 The Food Rooms are also used after school hours by the skills competition group. This is a program for students coming from different schools to prepare for textile competitions. As after school access from the exterior is required, the Textiles Lab and Food Rooms will be close to exterior doors. The millwork pods for sewing machines will maintain 1100mm clearance from each other for student movement and chairs. Placement and the layout of the eight (8) sewing pods in the Textiles Lab will be finalized by the Owner.

3.9.2.3 Only one (1) accessible kitchen unit is required in one of the two Food Rooms.

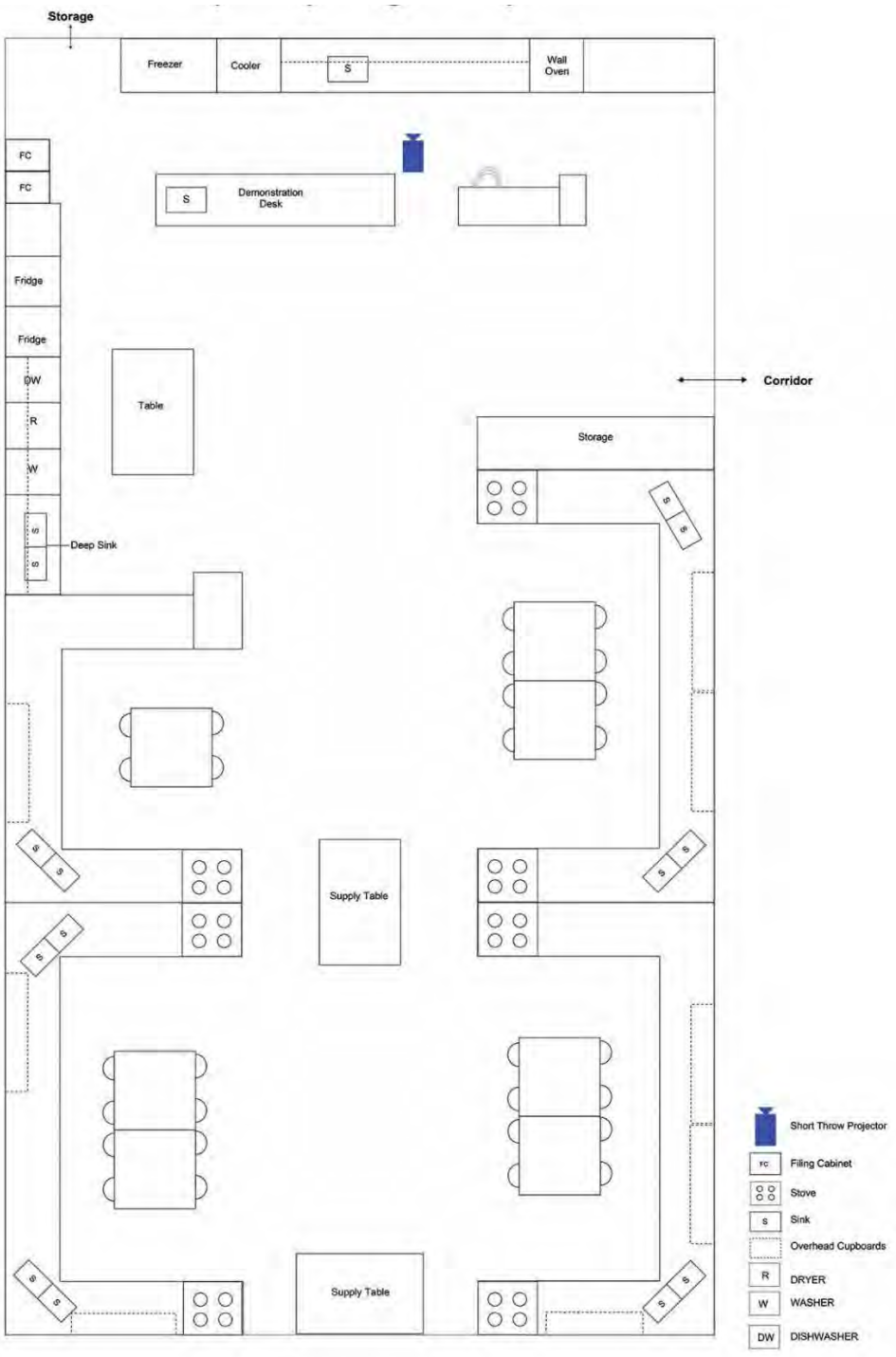
Picture 18 – Example of Student Desks for Textiles at School to be Accommodated in the New School



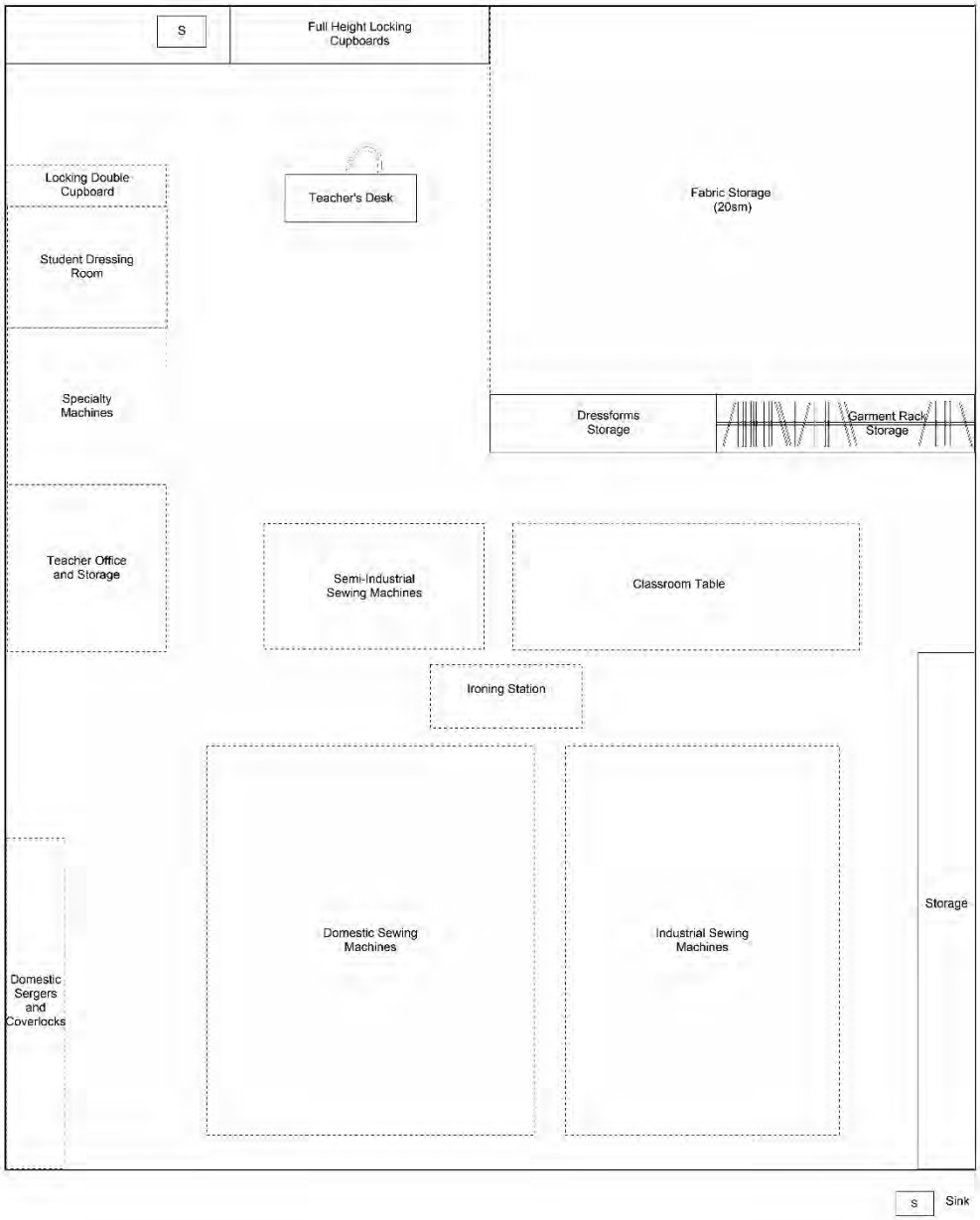
Picture 19 – Example of a Demonstration Table at Front of Classroom with Mirror, Magee Secondary School



Area and Adjacency Diagram 10: Applied Skills - Home Economics



Typology Diagram 8: Applied Skills - Food Lab



Typology Diagram 9: Applied Skills - Textiles

Table 12 – Applied Skills - Home Economics department area breakdown and description

09	Applied Skills (Home Economics)	# of Students	# of Staff/ Teachers	Quantity	Minimum NSM	Minimum Total NSM	Notes:
	Food Lab	30	1	2	120.0	240.0	
	Textiles Lab	30	1	1	120.0	120.0	
	Storage - Food	-	-	1	45.0	45.0	
TOTAL Applied Skills (Home Economics)						405.0 NSM	

3.10 APPLIED SKILLS – BUSINESS EDUCATION AND COMPUTERS

3.10.1 Description

3.10.1.1 The Business Education and Computers program at the School introduces students to the world of business, economics, finance, entrepreneurship, accounting, marketing, IT, human resources, production, and the importance of ethics and social responsibility. The program includes both classroom instruction (lecture and computer lab) for marketing and accounting, as well as hands-on instruction which includes mock-interviews and simulation projects (developing business plans).

3.10.1.2 The Computer program at the School focuses on the understanding and use of computer hardware and software tools. Examples of these tools include graphics, in conjunction with the Yearbook and Graphic Arts and Photography Lab, computer coding and programming, mathematics, and drafting. This department also includes computer space for academic testing which requires private zones for students writing exams.

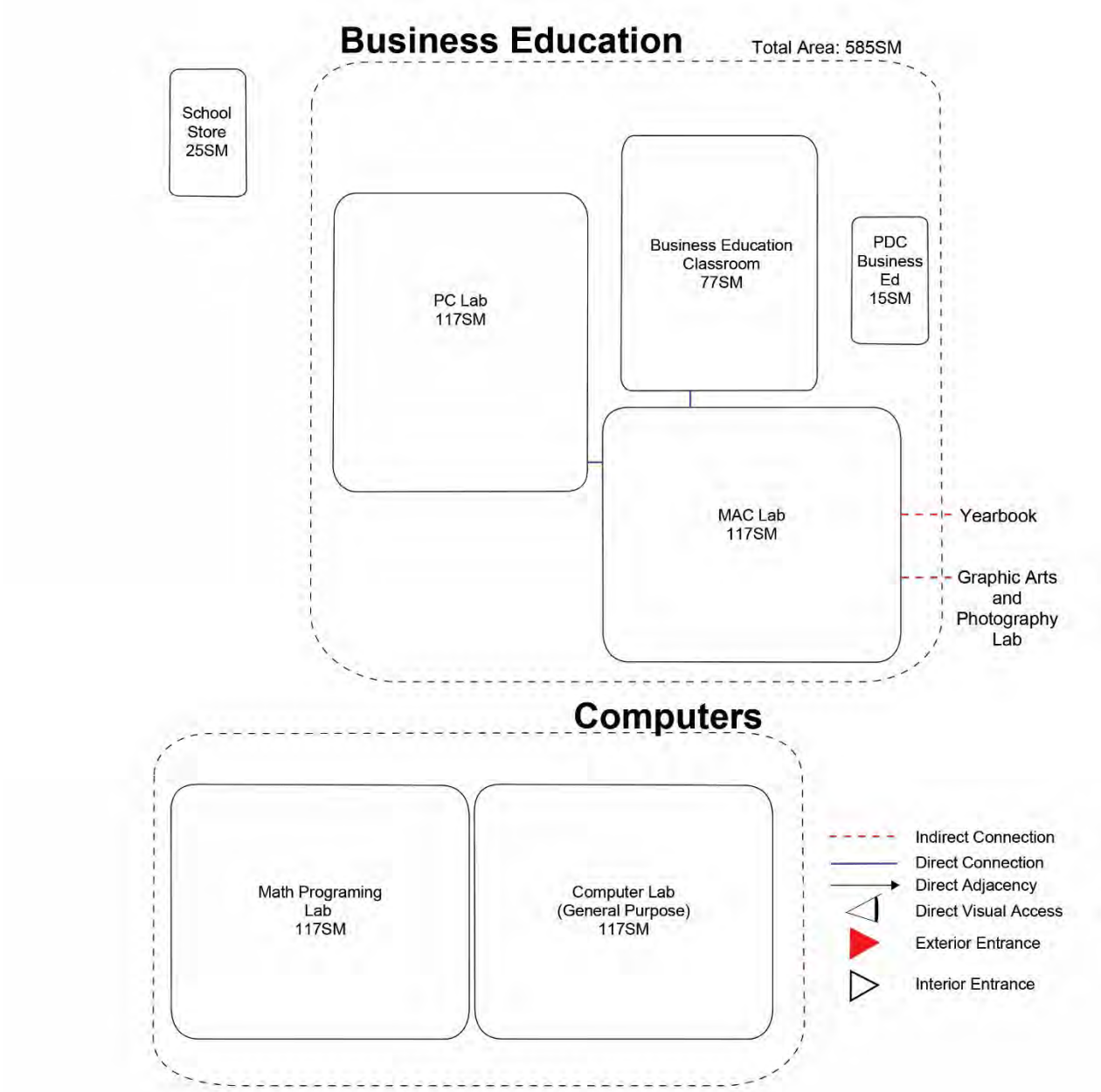
3.10.1.3 Students run the School Store which sells light, packaged snacks and beverages as well as School-branded merchandise.

3.10.1.4 The Business Education and Computers program uses computer labs for part of its course offering.

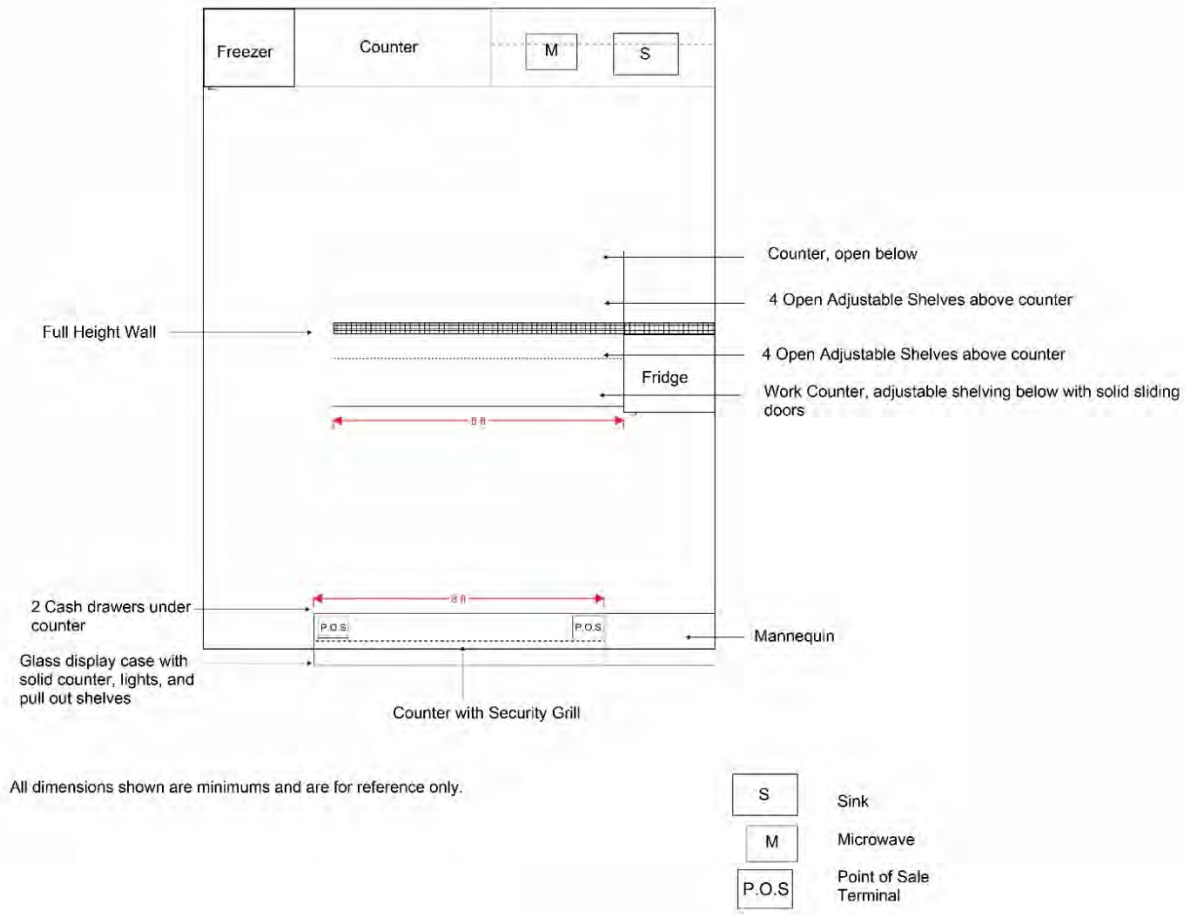
3.10.2 Direction

3.10.2.1 The Business Education and Computers program will involve the transition to laptops rather than desktop computers for ease of movement and versatility. However, all spaces are required to accommodate desktop computers. New programs such as 'bring your own device' will be introduced to allow students to use their own computers for their schoolwork. The program will expand into new software in digital graphics, coding, drafting, and mathematics.

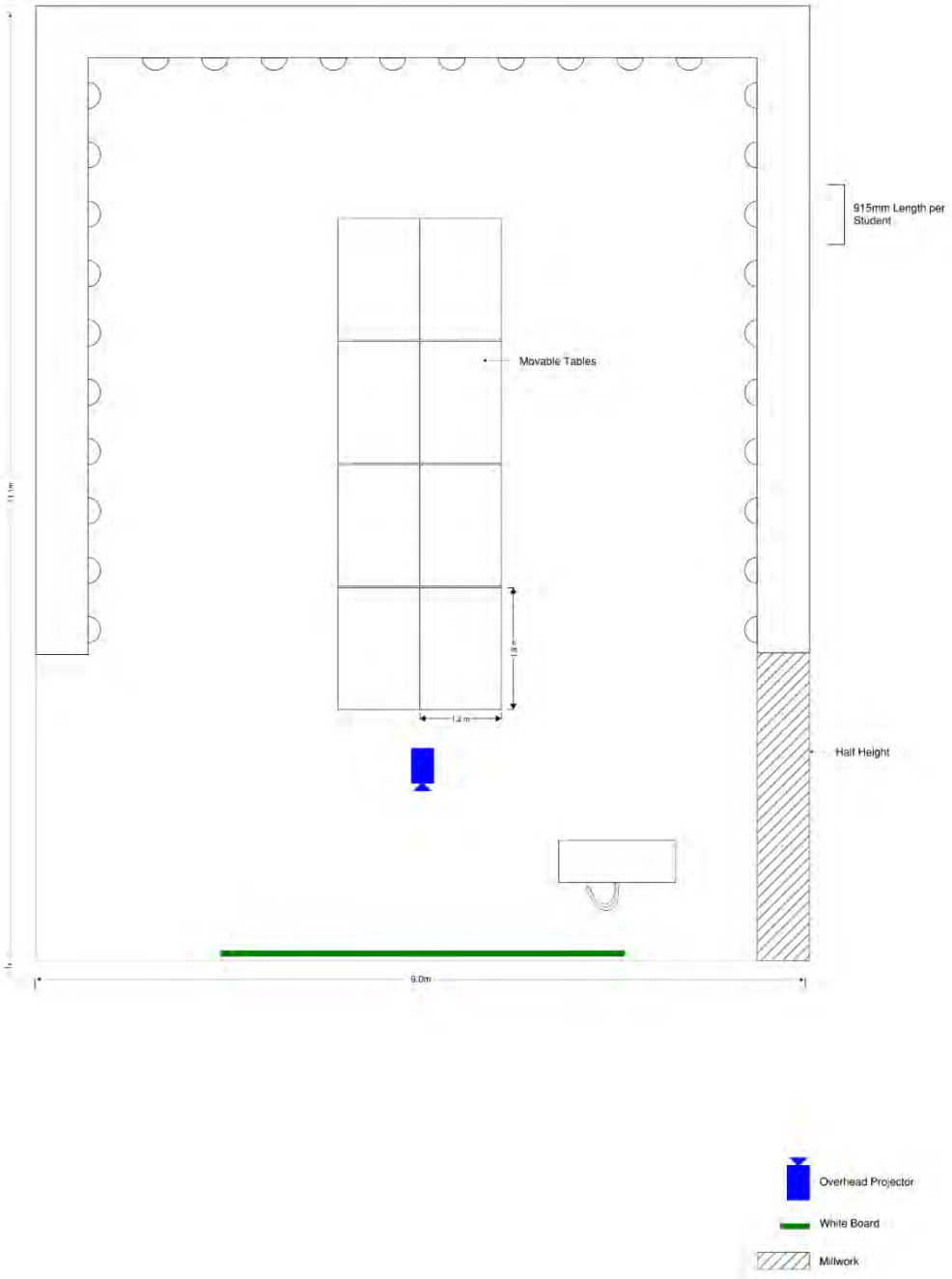
Picture 20 – Example of Computer Lab with Space for Group Work


Business Education
Total Area: 585SM
School Store 25SM
PC Lab 117SM
Business Education Classroom 77SM
PDC Business Ed 15SM
MAC Lab 117SM
Yearbook
Graphic Arts and Photography Lab
Computers
Math Programing Lab 117SM
Computer Lab (General Purpose) 117SM
Indirect Connection
Direct Connection
Direct Adjacency
Direct Visual Access
Exterior Entrance
Interior Entrance

Area and Adjacency Diagram 11: Applied Skills - Business Education and Computers



Typology Diagram 10: Applied Skills - School Store



Typology Diagram 11: Applied Skills - PC Lab and Mac Lab

Table 13 – Applied Skills - Business Education and Computers department area breakdown and description

10	Applied Skills (Business Education/Computers)	# of Students	# of Staff/ Teachers	Quantity	Minimum NSM	Minimum Total NSM	Notes:
	Business Education Classroom	30	1-2	1	77.0	77.0	Computer counter at perimeter of room
	PC Lab	30	1-2	1	117.0	117.0	
	MAC Lab	30	1	1	117.0	117.0	
	PDC (Small) - Business	-	3-4	1	15.0	15.0	Refer to PART 2- of this document.
	School Store	-	-	1	25.0	25.0	
	Math Programming Lab	30	1	1	117.0	117.0	
	Computer Lab	30	1	1	117.0	117.0	
TOTAL Applied Skills (Business Education and Computers)						585.0 NSM	

3.11 SPECIAL EDUCATION

3.11.1 Description

3.11.1.1 The Special Education Program at the School includes the following programs:

3.11.1.1 (1) LSP is for students who are part of the mainstream learning curriculum with a need for extra assistance. This program is available for students who need alternative test-writing space as well as smaller group lessons and one-on-one learning.

3.11.1.1 (2) LS is a program for up to 15 students with physical disabilities. Most of the students in this program are wheelchair-bound and have full-time caregivers. These learning rooms follow the Vancouver Coastal Health Occupational Therapy / Physical Therapy requirements to accommodate these students including special requirements for washrooms, showers, kitchen, physiotherapy, and charging stations for wheelchairs as well as wheelchair accessibility. At times all 15 students may have their own full-time caregivers with them in the space. Ceiling tracks for lifts will be incorporated into the washroom and shower rooms within this space. LS rooms will be located beside the parking lot for ease of transportation for wheelchair-bound students.

3.11.1.1 (3) LAC is a program for students with learning disabilities. This program is divided into two (2) academic groups: senior high school students and junior high school students. These classrooms will be centrally located in the School to promote integration with the rest of the student body. Students in this program often need quieter environments for schoolwork as well as extra tutoring in smaller group settings.

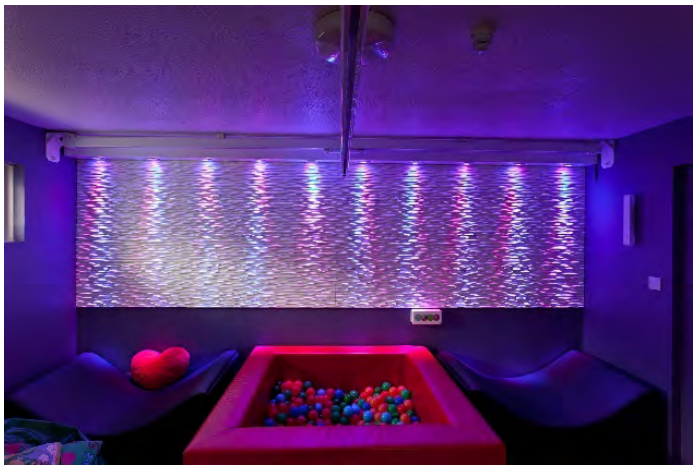
3.11.1.1 (4) LALS is a program that accommodates 15 students with developmental disabilities. This program teaches life skills such as how to cook and do laundry. Students need quieter space for learning and development so rooms are to be located in a less central part of the School. Direct connection to the exterior is necessary for students to cope with stressors.

3.11.2 Direction

3.11.2.1 The School will continue to support a large Special Education program. The direction of the program includes a General Sensory Room that is open to the general population of the School. The General Sensory Room will be located near the Counselling Suite to incorporate different strategies for different learning types for a more inclusive education program. Each program within Special Education will be strategically located in order to provide the best educational experience for students.

Picture 21 – Example of Sensory Room Swings

Picture 22 – Example of Sensory Room Swings

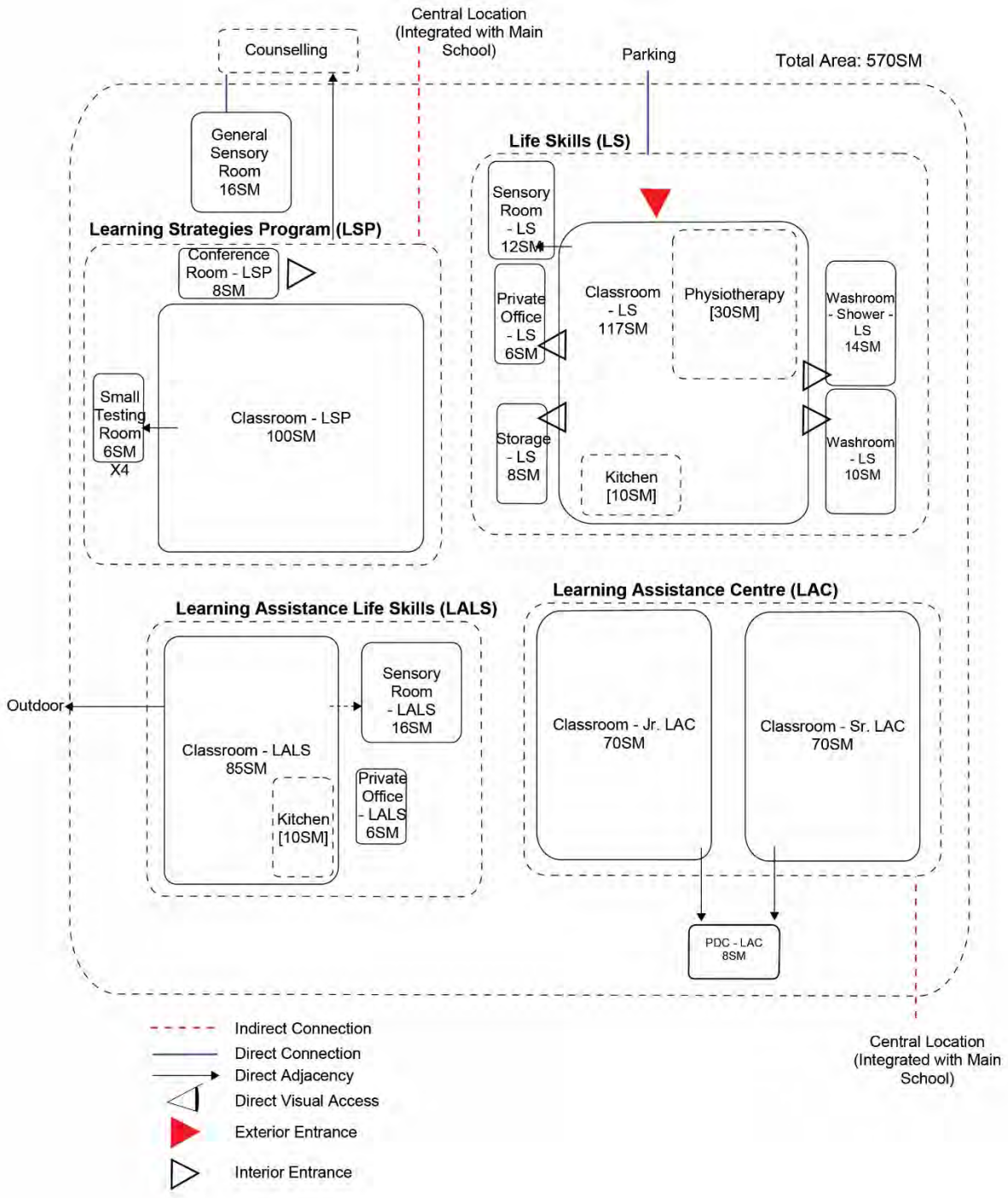


Picture 23 – Example of Soft Lighting, Ultraviolet Lighting - No Fluorescent Light

Picture 24 – Example of Sensory Room Ultraviolet Lighting, Fibre Optic Sensory Kit

3.11.3 Location and Adjacencies

3.11.3.1 The Special Education program will be integrated within the other departments in the School except for the LALS program. The LALS program will be in a remote location to the rest of the School because students in this program can be sensitive to noise; proximity to the Primary Corridors may be distracting/disturbing to these students. Classroom-LAC and Classroom-LSP will be fully interconnected with the rest of the School because students from these programs are integrated into mainstream learning programs. Isolating these programs would lead to segregation of students in these programs from mainstream students.


Central Location
(Integrated with Main
School)
Counselling
Parking
Total Area: 570SM
General
Sensory
Room
16SM
Life Skills (LS)
Sensory
Room
- LS
12SM
Learning Strategies Program (LSP)
Conference
Room - LSP
8SM
Private
Office
- LS
6SM
Classroom
- LS
117SM
Physiotherapy
[30SM]
Washroom
- Shower -
LS
14SM
Small
Testing
Room
6SM
X4
Classroom - LSP
100SM
Storage
- LS
8SM
Kitchen
[10SM]
Washroom
- LS
10SM
Learning Assistance Life Skills (LALS)
Learning Assistance Centre (LAC)
Outdoor
Sensory
Room
- LALS
16SM
Classroom - LALS
85SM
Kitchen
[10SM]
Private
Office
- LALS
6SM
Classroom - Jr. LAC
70SM
Classroom - Sr. LAC
70SM
PDC - LAC
8SM
Indirect Connection
Direct Connection
Direct Adjacency
Direct Visual Access
Exterior Entrance
Interior Entrance
Central Location
(Integrated with Main
School)

Area and Adjacency Diagram 12: Special Education

3.11.4 Internal Adjacencies Remarks – Special Education

3.11.4.1 LS will have direct visual connection to landscaped exterior spaces.

3.11.4.2 LALS will have direct visual connection with calmer exterior spaces.

Table 14 – Special Education department area breakdown and description

11	SPECIAL EDUCATION	# of Students	# of Staff/ Teachers	Quantity	Minimum NSM	Minimum Total NSM	Notes:
	Classroom-LSP	15-30	3-5	1	100.0	100.0	
	Small Testing Room, LSP	3-4	1	4	6.0	24.0	
	General Sensory Room	1-6	-	1	16.0	16.0	
	Conference Room, LSP			1	8.0	8.0	
	Classroom - LS	15	1-3	1	117.0	117.0	
	Private Office – LS	-	1	1	6.0	6.0	
	Sensory Room- LS	1-6	-	1	12.0	12.0	
	WC-Shower-LS			1	14.0	14.0	
	Washroom – LS			1	10.0	10.0	
	Storage- LS			1	8.0	8.0	
	Private Office LALS	-	1	1	6.0	6.0	
	Classroom – LALS			1	85.0	85.0	
	Sensory Room – LALS			1	16.0	16.0	
	Classroom – LAC			2	70.0	140.0	
	PDC (Small)- LAC		1-2	1	8.0	8.0	
TOTAL Special Education						570.0 NSM	

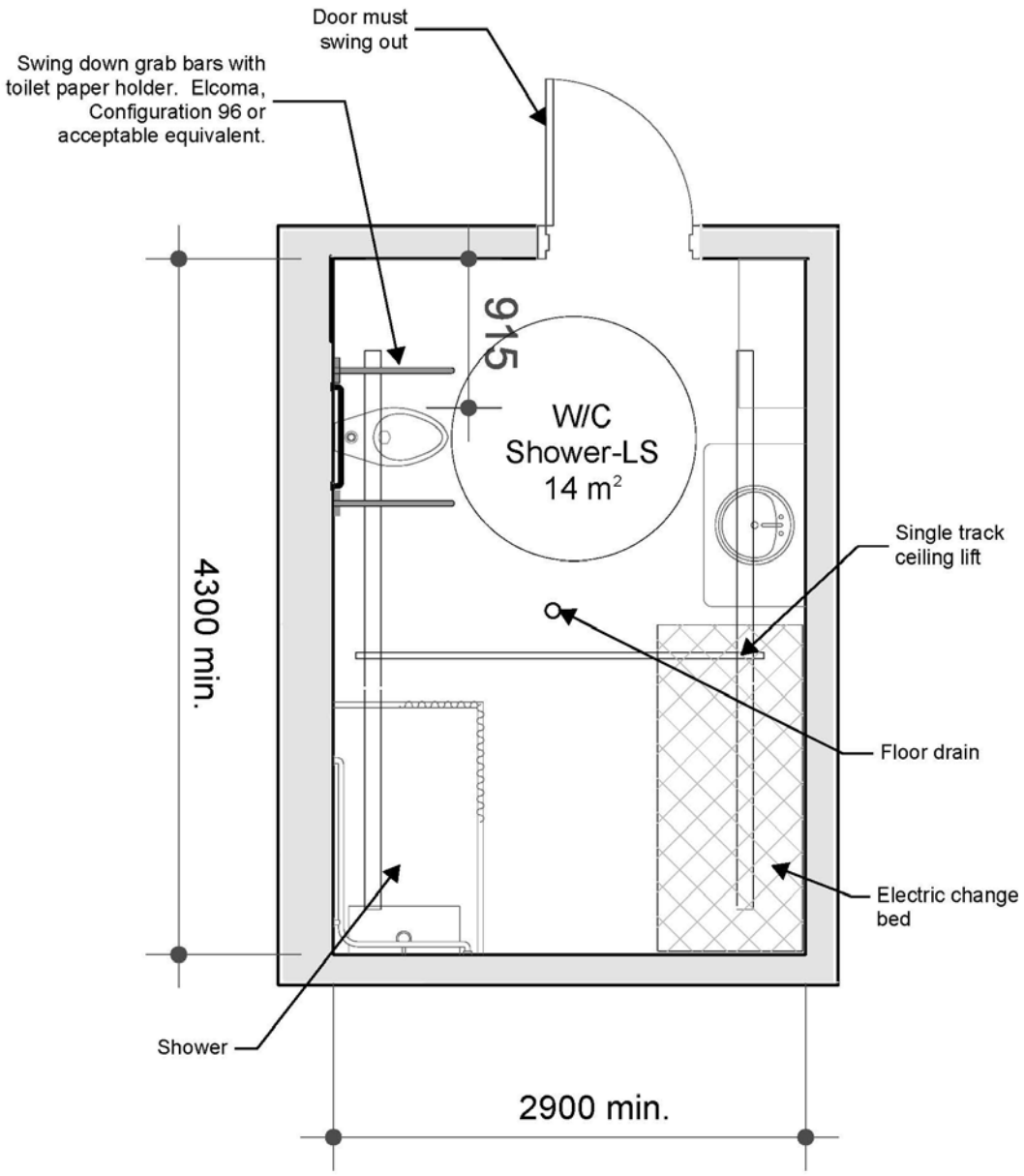


Figure 8: Life Skills – Shower and Washroom Layout

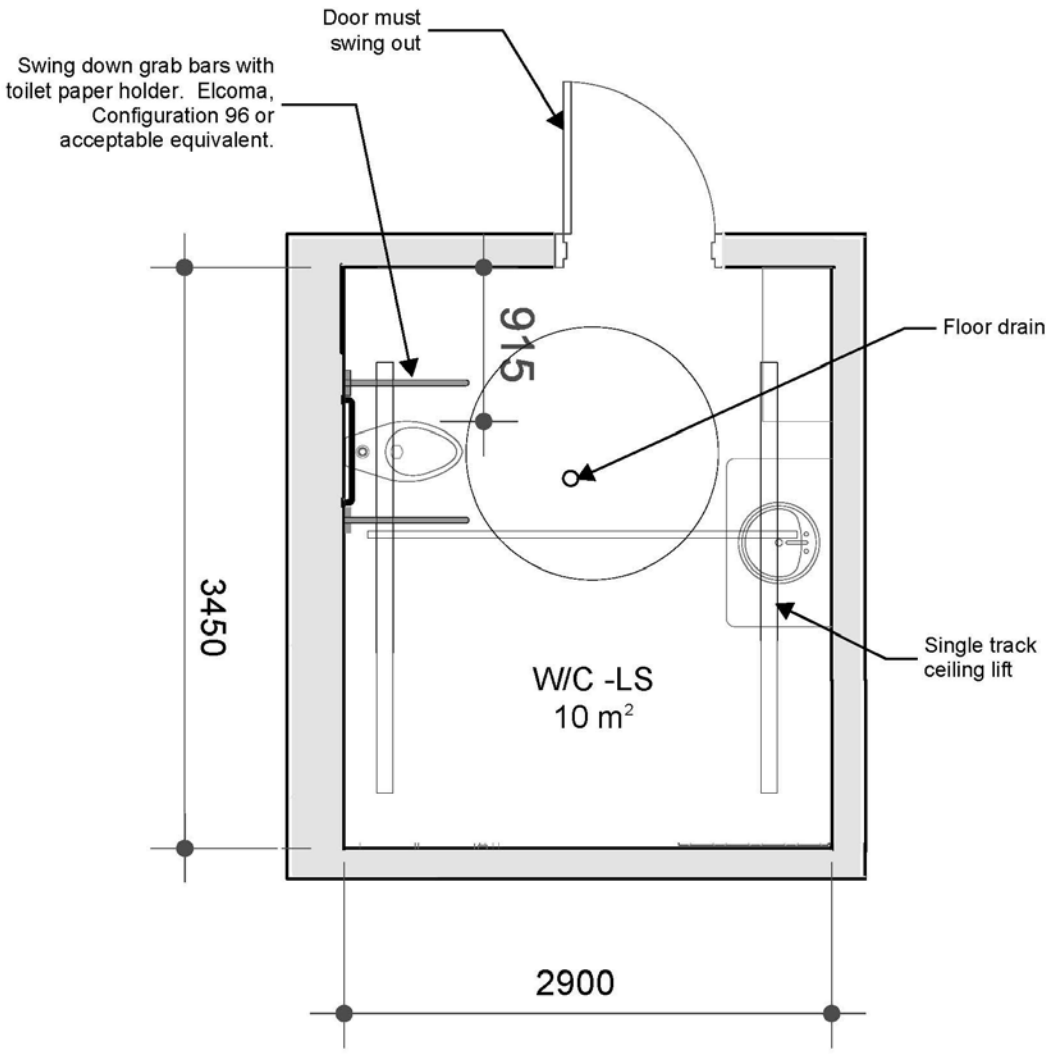


Figure 9: Life Skills - Washroom Layout

3.12 BUILDING ENGINEERING AND OPERATIONS

3.12.1 Description

3.12.1.1 This department provides the School staff the spaces required to maintain the School. It includes Loading/Shipping/Receiving, Maintenance Office, a Lunch Room for Building Engineering and Operations staff, and Surplus Storage in the building. Beyond the programmed space, there are also areas which are part of the building gross up and used by the facilities staff. These areas include custodial rooms, service spaces such as mechanical rooms, an electrical room, and communication rooms in the interior of the School. The areas in the exterior are a waste/recycling enclosure, an emergency supply building, and an exterior grounds storage space. (Refer to Schedule 1 – Statement of Requirements.)

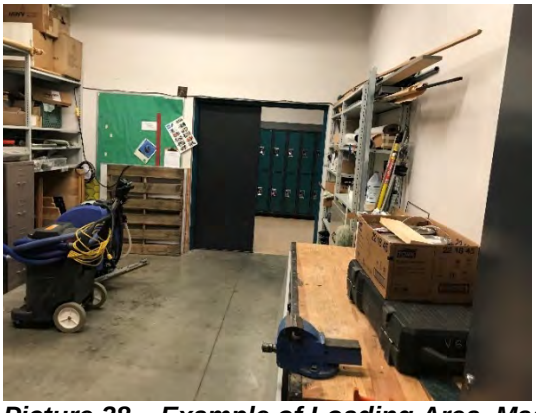
3.12.2 Direction

3.12.2.1 Ease of material flow in the loading area of the facility will aid in operations and maintenance.

Picture 25 – Example of Building Operations Lunchroom, Magee Secondary School

Picture 26 – Example of Loading and Shipping Staging Area, Magee Secondary School

Picture 27 – Example of Direct Access to Exterior Loading Zone, Garage Door for Easy Flow of Large Items, Magee Secondary School



Picture 28 – Example of Loading Area, Magee Secondary School

3.12.3 Location and Adjacencies

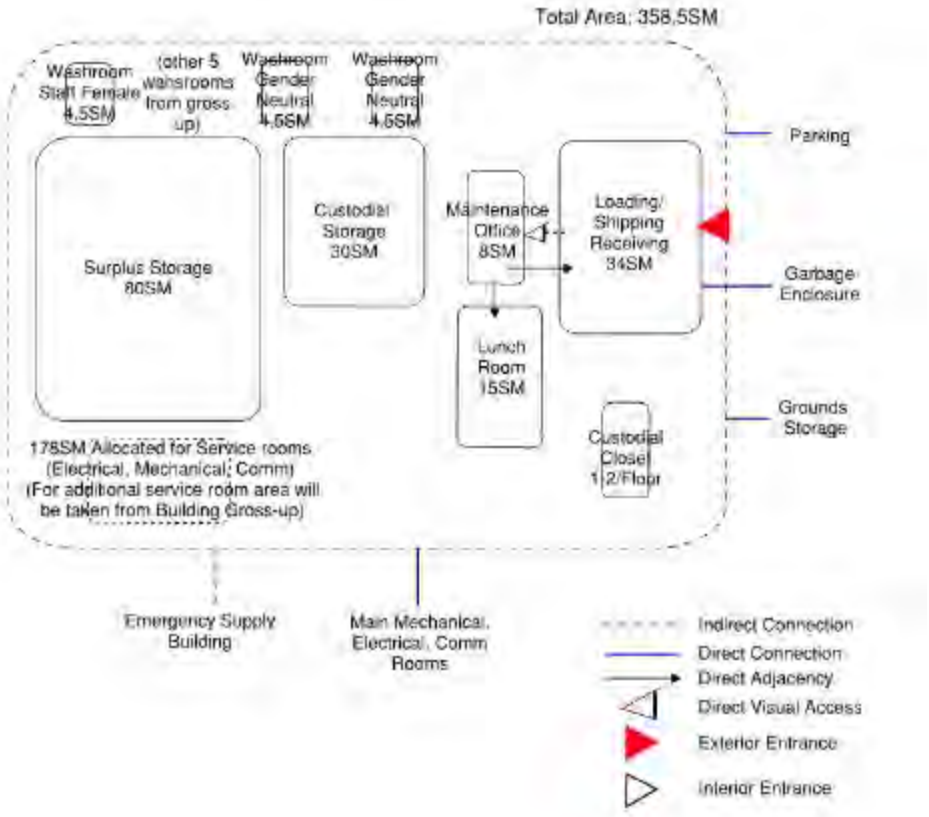
3.12.3.1 The Loading/Shipping Receiving zone will be located on the ground floor of the School with direct access at grade and to the waste/recycling area. An insulated, sectional, overhead door will allow ease of material flow into the Loading/Shipping Receiving area of the School from the exterior.

3.12.3.2 The Building Engineering and Operations space will not be located in a central or high-traffic part of the School.

3.12.3.3 The Maintenance Office will have direct visual access to the Loading/Shipping Receiving area and be adjacent to the Lunch Room and Surplus Storage.

3.12.3.4 A minimum of one (1) custodial room is required for each floor of the School. If the travel distance from the custodial room to the point of the floor plate exceeds 120 metres, then a second custodial room will be provided, such that no point of the School is more than 120 metres from a custodial room for ease of maintenance. All custodial rooms are to be provided with accessories and plumbing fixtures as per Schedule 1 – Statement of Requirements. All custodial rooms are taken out of the School gross up.

3.12.3.5 Exterior requirements include an emergency supply building which is described in Schedule 1 – Statement of Requirements.



Area and Adjacency Diagram 13: Buildings Engineering and Operations

Table 15 – Building Engineering and Operations area breakdown and description

12	Building Engineering and Operations	# of Staff	Quantity	Minimum NSM	Minimum Total NSM	Notes:
	Surplus Storage	-	-	80.0	80.0	
	Custodial Storage	-	1	30.0	30.0	
	Loading/Shipping Receiving	-	1	34.0	34.0	
	Maintenance Office	1	1	8.0	8.0	
	Lunch Room	10	1	15.0	15.0	
	Washroom – Gender Neutral		2	4.5	9.0	One (1) near Administration Suite
	Washroom – Staff		1	4.5	4.5	
	Building Services Gross Up		-	178.0	178.0	
TOTAL Building Engineering and Operations					358.5 NSM	

3.13 GENERAL STORAGE

3.13.1 Description

3.13.1.1 The General Storage department is split into four (4) spaces: three (3) General Bookrooms and one (1) Admin Archive Storage.

3.13.2 Direction

3.13.2.1 Each level to have a General Book Room.

3.13.2.2 Admin Archive Storage to be on the ground level.

3.13.2.3 High-density, compact storage may be considered for one (1) of the rooms in the General Storage department to increase capacity, subject to the Owner's review. It is anticipated that general storage needs will not diminish over time.

Picture 29 – Example of High Density Compact Mobile Density Storage

Table 16 – General Storage area breakdown and description

13	General Storage	# of Staff	Quantity	Minimum NSM	Minimum Total NSM	Notes:
	General Bookroom, Level 1	-	1	40.0	40.0	
	General Bookroom, Levels 2 & 3	-	2	50.0	100.0	
	Admin Archive Storage	-	1	10.0	10.0	
TOTAL General Storage					150.0 NSM	

3.14 DESIGN SPACE

3.14.1 Description

3.14.1.1 This component is comprised of general areas which will be used by the School community such as circulation space, elevators, washrooms, lockers, service rooms, and displays. These are the spaces that tie the departments together into a cohesive School.

Picture 30 – Example of Primary Corridor with Direct Daylighting and Student Huddle Opportunities

Picture 31 – Example of Light Through Clerestories Filtering into Corridors and School Commons, Kitsilano Secondary School

Picture 32 – Example of Corridor with Half-Height Lockers

Picture 33 – Example of Lockers Configured to Allow Informal Seating Away from Major Circulation

3.14.2 Additional Remarks – Design Space

3.14.2.1 Convenience stairs will be wider than VBBL requirements to allow for easy movement of students, especially at high-traffic locations when the School bell rings.

3.14.2.2 Primary Corridors will allow easy flow of students between classes.

3.14.2.3 Protection board and edge trims will be provided along public areas and corridors.

3.14.2.4 Public spaces that are not supervised, such as corridors, will have finishes that prevent students from hiding items.

3.14.2.5 Recessed ceiling tiles (that are within reach of a student standing on a chair) will be avoided at these areas.

3.14.2.6 Guardrails on upper floors will be higher than 1070mm for safety.

3.15 PROGRAMMED EXTERIOR SPACE

3.15.1 Description

3.15.1.1 The School curriculum incorporates the outdoors as part of classwork and after school programs. The exterior environment is another opportunity for students and the community to engage, compete in sports, and collaborate on School grounds.

3.15.1.2 Departments that require exterior spaces include:

3.15.1.2 (1) Multi Purpose – School Commons

3.15.1.2 (2) Athletics

3.15.1.2 (3) Arts – Fine Arts

3.15.1.2 (4) Applied Skills – Industrial Education

3.15.1.2 (5) Special Education – Life Assistance Life Skills

3.15.1.2 (6) Science

3.15.1.3 In addition to the exterior spaces required by departments, the following are additional exterior spaces required for the School:

3.15.1.3 (1) Emergency Supply Building

3.15.1.3 (2) Chain-link covered storage enclosure (outside Wood Workshop and Metal Workshop)

3.15.1.3 (3) Dust collector enclosure (outside Wood Workshop and Metal Workshop)

3.15.2 Direction

3.15.2.1 Provide multi-use exterior space no smaller than 75SM that will accommodate a classroom-size group of students to carry out learning activities such as outdoor sketching or science experiments on the ground level.

3.15.2.2 Provide exterior spaces on other School floor levels.

Picture 34 – Example of Exterior Space to

Picture 35 – Example of Exterior Learning

Encourage Outdoor Learning ***Terrace***

3.15.3 Location and Adjacencies

3.15.3.1 The Athletics Department frequently uses the outdoor spaces including the Astroturf field and the tennis courts.

3.15.3.2 The Science and Arts departments will be using the outdoor terrace for science experiments and for sketching in the natural light.

3.15.3.3 The Applied Skills - Industrial Education program requires direct access to the outdoors for both material flow and for opportunities to open up the workshops for fresh air and light. This is also where the bike maintenance area will be located.

3.15.3.4 Students from the LALS program within the Special Education Department often use the outdoors as part of their personal approach to managing stress so a direct connection to the outdoors is required.

01

Library Learning Commons (LLC)

Department:	**01 - Library Learning Commons (LLC)**
Minimum Area:	**14.00**
Ceiling Height:	**3050.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Teacher Librarian Centre desk space for two people to be in the middle with sight lines to the entrance, the office, the circulation desk

Critical Adjacencies

- Librarian's Information Desk / Circulation Desk - centrally located and requires visual connection to the main entry of the LLC and all spaces within the LCC

Design Features

- Book Drop Box (lockable) – locate a drop box within the Circulation Desk area, locate the 2nd drop box with access from the corridor to allow for afterhours book return. The 2nd drop box must be secured from the inside of the library with a secured access for staff to retrieve returned items.
- Allow space within the area to accommodate 1 book cart
- Circular desk:

- 2/3 of the circular desk to be lower height for seated work with legroom for chair and 1/3 of the circular desk to be at standing height
- Circular millwork 14sm with a 2.6m diameter void in the middle. Location to be verified with the user/client
- To have one deep lockable drawer to store files in addition to shallow un lockable drawers. Final design to be confirmed with users/Owner.
- To have drop box to be under the high standing area
- To have space for cart under the high standing area
- To have modesty screen

Occupancy

Capacity	*2*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Carpet*

Equipment and Accessories

Room Accessories

Computer	☑ *Two (2) Computer Workstation (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

Duplex Min. Qty	*6*

Other

Clocks	☑

Teacher Librarian Centre Desk
Room No. 01.001

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 4*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
011	Bookcase Medium Height Cabinet w/ Open Shelving	1	Yes	CSCI
Note: 2/3 of total				
013	Bookcase Tall Cabinet w/ Open Shelving	1	Yes	CSCI
Note: 1/3 of total				
024	Librarian Circulation Desk	1	Yes	CSCI

Department:	**01 - Library Learning Commons (LLC)**
Minimum Area:	**39.00**
Ceiling Height:	**3050.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Visual connection to main corridor
- Full glazing with visual connection to the common LLC area to allow for supervision

Design Features

- Due to equipment and the nature of activities in this space, it will require enclosure from the rest of the LLC
- This is a messy space and finishes must accommodate for easy cleaning

Additional Remarks

- "No Food/Drinks" sign

Occupancy

Capacity	*15*

Daylighting

☑ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Ceiling Finishes

Ceiling Characteristics	*ACT*

Wall Finishes

Wall Characteristics	*Painted GWB*

Equipment and Accessories

Sink Accessories

Soap Dispenser	☑
Paper Towel Dispenser	☑
Paper Towel Waste	☑

Room Accessories

Whiteboard	☑ *One of the walls to have full magnetic whiteboard with a full length marker tray*
Short Throw Projector (OSOI)	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Eight (8) Table mobile (OSOI)
2. Fifteen (15) Student Chairs (OSOI)

Plumbing Requirements

Sink Types

Double	☑

Sink Mounting

Counter	☑

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*Exhaust to suit equipment requirements and to remove fumes. Provide two exhaust arms with local on/off switches - locations to be confirmed.*
Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Power outlets at the counter wall to be above counter.
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*12*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 8*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks *Sidelight*
Other Doors *Man-door* ☑

Windows

Internal Glazing *Y/N* ☑ *Type From main corridor and from common LLC area for supervision*
Window Covering *RS - Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
008	Base Cabinet w/ Drawers and Double Door Cabinet	1	Yes	CSCI
	Note: With countertop; provided along 1 side of room, entire room length			
058	Wall Hung Upper Cabinet Lockable w/ Double Doors & Shelves	1	Yes	CSCI

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0032	Laminator	1	No	OSOI
0046	Shelving Unit	1	No	OSOI

Librarian Work Space / Cataloguing Office Room No. 01.005

Department: **01 - Library Learning Commons (LLC)**

Minimum Area: **10.00** *Ceiling Height:* **3050.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Enclosed space with good visual access to the common LLC area
- includes 2 workstations

Critical Adjacencies

- Must have direct connection to the Circulation Desk

Design Features

- Finishes must be durable and easy to clean

Occupancy

Capacity	*4*

Daylighting

☑ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Sink Accessories

Soap Dispenser	☑
Paper Towel Dispenser	☑
Paper Towel Waste	☑

Room Accessories

Tackboard	☑ *(1) 900x900*
Computer	☑ *Two (2) Computer Workstations (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Counter top fridge (OSOI)

Plumbing Requirements

Sink Types

Other	☑ *Single*

Sink Mounting

Counter	☑

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty *4*

Other Duplex Min. Qty

See General Power Requirement above

Communication Requirements

Communication Systems

Telephone ☑ *CAT6 Drop Min Qty: 1*

Data ☑ *CAT6 Drop Min Qty: 6*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks *Sidelight*

Other Doors *Man-door* ☑

Windows

Internal Glazing *Y/N* ☑ *Type Visual access to common LLC area*

Window Covering *RS - Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
008	Base Cabinet w/ Drawers and Double Door Cabinet	1	Yes	CSCI
	Note: With countertop. One bank of drawer of various size drawers. 2/3 of the room perimeter.			
021	General Work Surface	1	Yes	CSCI
	Note: 1/3 of the room perimeter			
052	Wall Hung Upper Cabinet open w/ Shelves	1	Yes	CSCI

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0029	Projector Portable Screen	2	No	OSOI
0030	Filing Cabinet #1	4	No	OSOI
0031	Filing Cabinet #2	1	No	OSOI
0045	Filing Cabinet #3	1	No	OSOI

Last modified: **May 30 2019 06:52 PM**

Details

Typical Program Area: **8.00**
Description: **01- Library and Learning Commons**
Notes:

Room Design Requirements

General Design Requirements

Critical Adjacencies

- The two study rooms are not required to be located adjacent to each other and can be dispersed
- Visual connection from the circulation desk.

Additional Remarks

1. "No Food/Drinks" sign

Occupancy

Capacity	*4*

Daylighting

☑ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Carpet Tile*

Ceiling Finishes

Ceiling Characteristics	*ACT*

Wall Finishes

Wall Characteristics	*Painted GWB*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *1200x1200*
Computer	☑ *One (1) Computer Workstation (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Conference Table, Chairs for six (6) people (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty *4*

- one per wall

Other Duplex Min. Qty

See General Power requirement above

Communication Requirements

Communication Systems

Data ☑ *CAT6 Drop Min Qty: 6*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door* ☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N* ☑ *Type for Teacher/ Librarian visibility and supervision, rooms must have glazing to corridor*
Window Covering *RS - Roller Shade*

Templated Rooms:

Room Function No.	Room No.	Room Name	RDS Status	Program Area
01.006		Study Room, 1	From 01.006 - 01.007	8.00
01.007		Study Room, 2	From 01.006 - 01.007	8.00

Department:	**01 - Library Learning Commons (LLC)**
Minimum Area:	**130.00**
Ceiling Height:	**3050.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Ability to function as 1 large space or as 2 spaces
- Space to act as 1 large gathering area or as 2 separate teaching areas that can be split using mobile furniture
- A folding wall that can divide the 2 spaces will be desirable

Critical Adjacencies

- Locate away from quiet reading zones
- Locate at the back of LLC so students do not use space as circulation and walk through

Design Features

- Accommodate a group of 30 students
- Not an enclosed space
- Folding acoustic wall between two spaces desirable
- The space to be obstruction free i.e. no columns in the space
-

Additional Remarks

- "No Food/Drinks" sign

Occupancy

Capacity	*66*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Carpet*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(2)1200 x 2400 (locate such that 2 separate classes can operate simultaneously*
Short Throw Projector (OSOI)	☑ *Lighting at the short throw projector to be on a separate zone.*
Computer	☑ *One (1) Computer Workstation (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Document camera projector (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*10*
Other Duplex Min. Qty	

See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 13*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Multi-Level	☑
Remarks	*- Library lighting to be on 5 zones*

Department:	**01 - Library Learning Commons (LLC)**
Minimum Area:	**34.00**
Ceiling Height:	**3050.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Technology zone must be in one zone and not dispersed to allow for class instruction
- accommodate 30 computers

Critical Adjacencies

- Allow for a printing station adjacent to this area
- Close proximity to the teacher circulation desk

Occupancy

Capacity	*31*

Daylighting

☑ *Direct*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Carpet*

Ceiling Finishes

Ceiling Characteristics	*ACT*

Equipment and Accessories

Room Accessories

Computer	☑ *Thirty (30) Computer Workstations (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Thirty (30) chairs on wheels (OSOI)
2. Table mobile for thirty (30) computers (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 44*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Windows

Exterior Window Required ☑ ☑ *Operable*
Window Covering Notes *RS- Roller Shade*

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0023	Printer	1	No	OSCI

Department: **01 - Library Learning Commons (LLC)**

Minimum Area: **45.00** *Ceiling Height:* **3050.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Space to allow for soft flexible seating for 15 to 20 students

Critical Adjacencies

- Lounge / Reading Area must be located at the main entry to the LLC
- Locate in 'high traffic zone' area of LLC upon entry

Occupancy

Capacity	*20*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Carpet*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Two (2) Security Gate (CSCI)
2. Two (2) Security Sensor (CSCI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required
- Provide cord protection for security gate and sensors

Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Power requirement above

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 4*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N* ☑ *Type Glazing to corridor*
Window Covering *RS - Roller Shade*

Department:	**01 - Library Learning Commons (LLC)**
Minimum Area:	**70.00**
Ceiling Height:	**3050.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Locate Fiction shelving surrounding the perimeter of the LLC and at reading lounge area and Technology Zone
- Millwork shelving at perimeter to be non moveable and the millwork shelving in the middle of space to be moveable

Design Features

- All shelving unit widths to be same module
- Full height shelves if against a wall
- Half height moveable shelves in the space
- Fiction collection must be located on full height shelving along perimeter of space; medium height may be utilized
- At limited locations of exterior windows

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Carpet*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Shelving for books (268 m linear) (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

Duplex Min. Qty	*6*
Other Duplex Min. Qty	*6* Bottom of book shelving

Other

Clocks	☑

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 8*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Windows

Internal Glazing *Y/N*☑
Window Covering *RS - Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
011	Bookcase Medium Height Cabinet w/ Open Shelving	1	Yes	CSCI
	Note: Provide quantity necessary to equal 150 lineal metres of shelf in fixed units in conjunction with item 013 Bookcase Tall Cabinet w/ Open Shelving.			
012	Bookcase Medium Height Cabinet w/ Open Shelving Movable	1	Yes	CSCI
	Note: Provide quantity necessary to equal 36 lineal metres of shelf in moveable units.			
013	Bookcase Tall Cabinet w/ Open Shelving	1	Yes	CSCI
	Note: Provide quantity necessary to equal 150 lineal metres of shelf in fixed units in conjunction with item 011 Bookcase Medium Height Cabinet w/ Open Shelving.			

Department:	**01 - Library Learning Commons (LLC)**
Minimum Area:	**70.00**
Ceiling Height:	**3050.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Locate Non-Fiction in half height shelving dispersed within the common areas of the LLC. Shelving must anticipate how books will be located and allow for easy navigation by students and staff. Shelving is to lockable movable shelving to allow greater flexibility. Use lockable movable shelving to divide the two open learning spaces from each other.

Design Features

- Full height shelves if against a wall
- Half height moveable shelves in the space
- Allow space between stacks for dispersed reading areas
- 70% of LLC shelving to be placed within non-fiction collection
- All shelving unit widths to be same module

Daylighting

☐ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Carpet*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Shelving for books (268 m linear) (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

Duplex Min. Qty	*6*
Other Duplex Min. Qty	*6* Bottom of book shelving

Other

Clocks	☑

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 2*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
010	Bookcase Low Height Cabinet w/ Open Shelving	1	Yes	CSCI
	Note: Provide quantity necessary to equal 345 lineal metres of shelf in fixed units in conjunction with item 011 Bookcase Medium Height Cabinet w/ Open Shelving. Ensure stacks are not too high for ease of supervision.			
011	Bookcase Medium Height Cabinet w/ Open Shelving	1	Yes	CSCI
	Note: Provide quantity necessary to equal 345 lineal metres of shelf in fixed units in conjunction with item 010 Bookcase Low Height Cabinet w/ Open Shelving.			
012	Bookcase Medium Height Cabinet w/ Open Shelving Movable	1	Yes	CSCI
	Note: Provide quantity necessary to equal 89 lineal metres of shelf in movable units. All units to be same module.			

02

Administration, Health, Counselling & International Education

Department:	**02 - Administration, Health, Counselling & International Education**
Minimum Area:	**15.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Can accommodate a circular meeting table
- 1 workstation for Principal

Critical Adjacencies

- Must have visual access to the main school entry
- Guests visiting the Principal and VPs need to flow through the front reception desk first before they are directed to the private offices.

Additional Remarks

- L shape desk
- 1 Office Chair
- Visitor table for 6 (chairs) people
- Lockable filing cabinet
- Sideboard storage
- View to the entrance
- PA system to be visible from office door

Occupancy

Capacity	*6*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Carpet Tile*

Equipment and Accessories

Room Accessories

Computer	☑ *One (1) Desktop Computer (OSOI)*
Coat Hook	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Desktop computer (OSOI)
2. Five (5) Person Round Table & Chairs (OSOI)
3. One (1) Office Chair (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty *4*

Other

Clocks ☑

Communication Requirements

Communication Systems

Telephone ☑ *CAT6 Drop Min Qty: 1*
Data ☑ *CAT6 Drop Min Qty: 6*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable With visual access to the main school entry*
Internal Glazing *Y/N*☑
Window Covering Notes *RS- Roller Shade (exterior and internal glazing)*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
030	Tall Cabinet, Admin offices	1	Yes	CSCI

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0116	Cabinet #1	1	No	OSOI
0117	Cabinet #2	1	No	OSOI
0118	Desk #1	1	No	OSOI

Last modified: **November 04 2019 01:12 PM**

Details

Typical Program Area:	**10.00**
Description:	**02- Administration, Health, Counselling & International Education**
Notes:	

Room Design Requirements

General Design Requirements

Activities and Functions

- Can accommodate up to 5 people in a meeting
- 1 Workstation for Vice-Principal

Critical Adjacencies

- Guests visiting the Principal and VPs need to flow through the front reception desk first before they are directed to the private offices.

Occupancy

Capacity	*5*

Daylighting

☑ *Direct*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Carpet Tile*

Equipment and Accessories

Room Accessories

Computer	☑ *One (1) Computer Workstation (OSOI)*
Coat Hook	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Desktop Computer (OSOI)
2. One (1) Office Chair (OSOI)
3. Three (3) Visitor Chairs (OSOI)
4. One (1) Filing Cabinet -Lockable (OSOI)
5. One (1) Sideboard storage (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty *3*
Other Duplex Min. Qty See General Power requirement above

Communication Requirements

Communication Systems

Telephone ☑ *CAT6 Drop Min Qty: 1*
Data ☑ *CAT6 Drop Min Qty: 6*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Window Covering Notes *RS- Roller shade*

Millwork Schedule

Item No.	Item Name	Qty	To be Modeled	Responsibility
06.4000.0428	Tall Cabinet, Admin offices	1	Yes	CSCI

Existing Equipment

Item No.	Item Name	Qty	To be Modeled	Responsibility
00.1356	L-Shaped Desk	2	No	OSOI

Templated Rooms:

Room Function No.	Room No.	Room Name	RDS Status	Program Area
02.002		Vice Principal office, 2	From 02.002 - 02.003	10.00
02.003		Vice Principal office, 1	From 02.002 - 02.003	10.00

Department:	**02 - Administration, Health, Counselling & International Education**
Minimum Area:	**22.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Waiting area with chairs
- 4 open office workstations: 1 Reception, 3 Workstations(Accountant, Records, Secretary)

Critical Adjacencies

- The open office workstations are to be located immediately adjacent to waiting & reception area , so staff can quickly go up to the reception when visitors arrive. These must be considered as one large open space.

Additional Remarks

- Accommodate lockable file cabinets to store student records dispersed within open area but not near reception desk for security and privacy

Occupancy

Capacity	*4*

Daylighting

☑ *Direct*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Carpet*

Equipment and Accessories

Room Accessories

Tackboard	☑ *(2) 1200x2400*
Computer	☑ *Four (4) Computers Workstations (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. PA system (CSCI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power	Provide power to items under Equipment & Accessories and Existing Equipment list as required
Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 5*
Data	☑ *CAT6 Drop Min Qty: 10*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N*☑
Window Covering Notes *RS- Roller Shade (exterior and internal glazing)*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
030	Tall Cabinet, Admin offices	1	Yes	CSCI

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0122	Printer #1	1	No	OSOI
0127	Filing Cabinet #1	1	No	OSOI
0128	Filing Cabinet #2	1	No	OSOI
0129.1	Desk 1	5	No	OSOI
0129.2	Desk 2	2	No	OSOI
0129.3	Desk 3	1	No	OSOI
0129.6	Cabinet/Desk Shelf #1	2	No	OSOI
0129.7	Cabinet/Desk Shelf #2	2	No	OSOI
0130	Admin Desk Cabinet	1	No	OSOI
0131	Printer #2	1	No	OSOI
0135	Filing Cabinet #3	1	No	OSOI
0374	Filing Cabinet #10	1	No	OSOI
0380	Filing Cabinet	1	No	OSOI

Department:	**02 - Administration, Health, Counselling & International Education**
Minimum Area:	**8.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Accommodate 3 people

Critical Adjacencies

- The Police Office (SLO) must be within the Administration suite however students must not have to pass the SLO office to get to the Principal or VPs offices. Too close a proximity of the SLO office may deter students from meeting with school staff due to fear of getting into trouble.

Occupancy

Capacity	*3*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Carpet*

Equipment and Accessories

Room Accessories

Computer	☑ *Two (2) Computer Workstation (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Desk (OSOI)
2. One (1) Chair (OSOI)
3. Three (3) Visitor chairs (OSOI)
4. One (1) bookshelf (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*2*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 6*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N*☑
Window Covering Notes *RS- Roller Shade (exterior and internal glazing)*

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0166	Filing Cabinet #7	1	No	OSOI
0167	Filing Cabinet #8	1	No	OSOI

Department:	**02 - Administration, Health, Counselling & International Education**
Minimum Area:	**10.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Requires visual sightlines to open office when door is open
- The First Aid room, Washroom and the Nurse Office must have direct adjacency to each other and must not have any windows looking in from the public areas for privacy.

Occupancy

Capacity	*2*

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Double	☑

Sink Mounting

Counter	☑

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*To maintain room under negative pressure relative to adjacent spaces. With local/on off switch and BMS control.*
Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*4*
Other Duplex Min. Qty	See General Power requirement above

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 4*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door* ☑

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
004	Base Cabinet w/ Double Doors & Adjustable Shelves	1	Yes	CSCI
	Note: All millwork along one wall only			
021	General Work Surface	1	Yes	CSCI
	Note: All millwork along one wall only			
055	Wall Hung Upper Cabinet w/ Double Doors & Shelves	1	Yes	CSCI
	Note: All millwork along one wall only			
057	Wall Hung Lockable Medicine Cabinet	1	Yes	CSCI
	Note: All millwork along one wall only			

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0172	Microwave #1	1	No	OSOI
0173	Ice Machine	1	No	OSOI
0174	Fridge	1	No	OSOI
0176	First Aid Bed	3	No	OSOI
0178	Supplies Cabinet	1	No	OSOI
0182	Filing Cabinet #9	1	No	OSOI

Department:	**02 - Administration, Health, Counselling & International Education**
Minimum Area:	**5.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- The First Aid room and Washroom must have direct adjacency to each other and must not have any windows looking in from the public areas for privacy. The washroom does not require access from the administration suite, staff can enter the washroom through the first aid room.

Additional Remarks

- ADA Gender neutral washroom

Occupancy

Capacity	*1*

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Tile*

Equipment and Accessories

Sink Accessories

Soap Dispenser	☑
Paper Towel Dispenser	☑
Paper Towel Waste	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1*
Other Duplex Min. Qty	*1*

- (1) GFI

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door* ☑

Department:	**02 - Administration, Health, Counselling & International Education**
Minimum Area:	**8.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Accommodate 1 workstation

Critical Adjacencies

- Does not require adjacency to administration suite

Occupancy

Capacity	*1*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Computer	☑ *Two (2) Computer Workstation (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Desk (OSOI)
2. One (1) Office chair (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*2*
Other Duplex Min. Qty	See General Power requirement above

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 6*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N*☑
Window Covering Notes *RS- Roller Shade (exterior and internal glazing)*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
003	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
Note: With countertop				
033	Tall Open Wall Shelving	1	Yes	CSCI
052	Wall Hung Upper Cabinet open w/ Shelves	1	Yes	CSCI

Department:	**02 - Administration, Health, Counselling & International Education**
Minimum Area:	**14.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- The copy room must have direct access off the public corridor, so staff can access this after hours when the administration area is closed off.
- there must also be a secondary access door directly from the administration suite in addition to the one above for convenience.

Occupancy

Capacity	*2*

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (2) Metal Shelving (OSOI)

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*To remove fumes from copiers and printers*
Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*2*
Other Duplex Min. Qty	See General Power requirement above

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 6*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door* ☑

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
004	Base Cabinet w/ Double Doors & Adjustable Shelves	1	Yes	CSCI
	Note: with countertop			
033	Tall Open Wall Shelving	1	Yes	CSCI
	Note: For storing file boxes, paper, envelopes, binders, office supplies			

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0156	Photocopy Machine #1	1	No	OSOI
0186	Photocopy Machine #2	1	No	OSOI

Department:	**02 - Administration, Health, Counselling & International Education**
Minimum Area:	**4.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Mailbox for 140 staff
- Not an enclosed room can be in a corridor in the general area.
- Security achieved as the general office area will be locked at end of the day.
- Must have visibility from the open office workstation area.

Critical Adjacencies

- Considered loud spaces and must be located away from the open work stations and the private offices.

Design Features

- 140 mail box cubbies

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

HVAC Requirements

HVAC

Minimum Temp (C)	*21*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
048	Wall Hung Mailbox	1	Yes	CSCI

Note: 140 cubbies

Department:	**02 - Administration, Health, Counselling & International Education**
Minimum Area:	**8.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Room for confidential student record storage. Accessed by counsellors and administration.

Critical Adjacencies

- Locate at back of open office area
- Out of sight lines from public corridor and exterior glazing
- Secure room to store student record.

Additional Remarks

- A medium size safe to store cash.
- Metal shelving

Occupancy

Capacity	*1*

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Safe Medium (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*19*

Electrical Requirements

Power

Duplex Min. Qty	*2*

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 2*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door*☑

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0151	Small Filing Cabinet	6	No	OSOI
0152	Filing Cabinet #4	2	No	OSOI
0153	Filing Cabinet #5	1	No	OSOI
0154	Mobile Shelving Unit with Outlet	1	No	OSOI
0155	Key Storage	1	No	OSOI
0162	Filing Cabinet #6	1	No	OSOI
0367	Storage Unit	1	No	OSOI

Department:	**02 - Administration, Health, Counselling & International Education**
Minimum Area:	**65.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Lounge seating
- Lunch tables, chairs

Critical Adjacencies

- Not to be located directly adjacent to administration or counselling suite. Provide a minimum 60 M distance.

Additional Remarks

- Finishes to be easy to clean as space will be used as a lunchroom

Occupancy

Capacity	*25*

Daylighting

☑ *Direct* ☑ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Tackboard	☑ *1200 x 2400*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Two (2) Full-size Fridges (OSCI)
2. One (1)Dishwasher (OSCI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Double	☑

Sink Mounting

Counter	☑

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*To remove cooking smells from above microwaves and toaster. Ventilation rate sufficient to maintain room at negative pressure relative to corridor. Provide local on/off switch and BMS control.*
Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty *6*

Other Duplex Min. Qty

See General Power requirement above

Other

Clocks ☑

Communication Requirements

Communication Systems

Telephone ☑ *CAT6 Drop Min Qty: 1*

Data ☑ *CAT6 Drop Min Qty: 4*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*

Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*

Internal Glazing *Y/N*☑

Window Covering Notes *RS- Roller Shade (exterior and internal glazing)*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
004	Base Cabinet w/ Double Doors & Adjustable Shelves	1	Yes	CSCI
055	Wall Hung Upper Cabinet w/ Double Doors & Shelves	1	Yes	CSCI

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0194	Piano	1	No	OSOI
0204	Printer #4	1	No	OSOI
0205	Printer #5	1	No	OSOI
0209	Micowave #2	1	No	OSOI
0210	Toaster Oven #1	1	No	OSOI
0211	Microwave #3	1	No	OSOI
0212	Toaster Oven #2	1	No	OSOI
0213	Microwave #4	1	No	OSOI
0214	Microwave #5	1	No	OSOI
0215	Microwave #6	1	No	OSOI
0216	Coffee Maker	1	No	OSOI
0381	Microwave	1	No	OSOI
0382	Mini Fridge	1	No	OSOI

Department:	**02 - Administration, Health, Counselling & International Education**
Minimum Area:	**2.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Alcove for storage of coats for administration staff in open workstations

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Other ☑ *Coat hanging bar*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

HVAC Requirements

HVAC

Minimum Temp (C)	*19*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door* ☑

Department:	**02 - Administration, Health, Counselling & International Education**
Minimum Area:	**20.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- The conference room must be a flexible space that can be used by Administration, Counselling or booked by teachers and staff in other departments.
- Ability to accommodate up to 20 people for a meeting

Occupancy

Capacity	*20*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Carpet*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *1200x2400*
Tackboard	☑ *1200x2400*
Short Throw Projector (OSOI)	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Conference Table for 20 people (OSOI)
2. Twenty (20) Conference Chairs (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*8*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 2*
Data	☑ *CAT6 Drop Min Qty: 10*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N*☑
Window Covering Notes *RS- Roller Shade (exterior and internal glazing)*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
021	General Work Surface	1	Yes	CSCI

Waiting Area - Counselling & International Education
Room No. 02.017

Department:	**02 - Administration, Health, Counselling & International Education**
Minimum Area:	**15.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Seating for 10 people waiting (includes a mix of soft seating and 1-2 small tables with chairs)

Critical Adjacencies

- 3 entries required. One entry to be discreet and not located off the main public circulation, one entry to be off the main public circulation, one entry directly to the exterior of the building
- There must not be visual access from the waiting area to the main public circulation

Occupancy

Capacity	*10*

Daylighting

☑ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Tackboard	☑ *1200x2400*
Computer	☑ *Six (6) Computer Workstation (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Couch (OSOI)
2. Four (4) visitor chairs (OSOI)
3. Two (2) coffee tables (OSOI)
4. Printer (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Waiting Area - Counselling & International Education
Room No. 02.017

Electrical Requirements

Power

General Power

- Each workstation to have three (3) duplex
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 6*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door* ☑

Windows

Internal Glazing *Y/N* ☑ *Type Frosted glass*
Window Covering *RS - Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
014	Brochure Display	1	Yes	CSCI

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0246	Pamphlet Holder #1	1	No	OSOI
0247	Pamphlet Holder #2	1	No	OSOI

Department:	**02 - Administration, Health, Counselling & International Education**
Minimum Area:	**15.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Meeting 6-8 people

Design Features

- Prep space
- Space must allow for a central collaboration table

Additional Remarks

- Refer to diagram in Section 2.0 for PDC typologies

Occupancy

Capacity	*8*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Whiteboard	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Kettle (OSOI)
2. Office chairs (6-8 people) (OSOI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Double	☑

Sink Mounting

Counter	☑

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power	
	Provide power as per FFE & Existing Equipment list
Duplex Min. Qty	*7*
Other Duplex Min. Qty	
	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 6*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 600mm wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N*☑
Window Covering *RS - Roller Shade*
Window Covering Notes *RS - Roller Shade (exterior and internal glazing)*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
003	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
	Note: With counter, Type-1, provided instead of tall cabinet			
021	General Work Surface	1	Yes	CSCI
039	Tall Storage Cabinet w/ Lockable Doors and Whiteboard	1	Yes	CSCI
	Note: Type-2, provided instead of upper cabinets & Lower Cabinets. Total millwork width: 1800 mm			
052	Wall Hung Upper Cabinet open w/ Shelves	1	Yes	CSCI
	Note: 50% uppers open, Type-1, provided instead of tall cabinet			
058	Wall Hung Upper Cabinet Lockable w/ Double Doors & Shelves	1	Yes	CSCI
	Note: 50% uppers lockable, Type-1, provided instead of tall cabinet			

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0219	Toaster Oven	1	No	OSOI
0220	Microwave	1	No	OSOI
0221	Mini Fridge	1	No	OSOI
0242	Printer	1	No	OSOI

Department:	**02 - Administration, Health, Counselling & International Education**
Minimum Area:	**20.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Space to accommodate a meeting table for 10 people and a teacher work station

Critical Adjacencies

- Adjacency to counselling

Occupancy

Capacity	*10*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Tackboard	☑ *(2) 1200x2400*
Computer	☑ *One (1) Computer Workstation (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) File storage, lockable (OSOI)
2. One (1) mini-fridge (OSOI)
3. One (1) microwave (OSOI)
4. One (1) Printer (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

Duplex Min. Qty	*4*
Other Duplex Min. Qty	*6*

- (1) computer
- (1) printer,
- (1) mini-fridge
- (1) microwave
- (2) teachers table

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 8*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N*☑
Window Covering *RS - Roller Shade*
Window Covering Notes *RS- Roller Shade (exterior and internal glazing)*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
003	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
005	Base Cabinet w/ Lockable Double Doors & Adjustable Shelves	1	Yes	CSCI

Note: with countertop, 50% storage lockable

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty *2*

Other Duplex Min. Qty

See General Power requirement above

Other

Clocks ☑

Communication Requirements

Communication Systems

Telephone ☑ *CAT6 Drop Min Qty: 1*

Data ☑ *CAT6 Drop Min Qty: 6*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Door to have narrow vision glass with covering - Minimum 915 mm - Wood doors*

Other Doors *Man-door* ☑

Windows

Exterior Window Required ☑ ☑ *Operable*

Window Covering Notes *RS- Roller Shade*

Existing Equipment

Item No.	Item Name	Qty	To be Modeled	Responsibility
00.0504	Filing Cabinet #1	2	No	OSOI
00.0509	Filing Cabinet #2	1	No	OSOI
00.0513	Filing Cabinet #3	1	No	OSOI
00.0514	Filing Cabinet #4	1	No	OSOI
00.0523	Filing Cabinet #5	1	No	OSOI
00.0529	Filing Cabinet #6	2	No	OSOI
00.0531	Filing Cabinet #7	1	No	OSOI

Templated Rooms:

Room Function No.	Room No.	Room Name	RDS Status	Program Area
02.020		Counselling office, 1	From 02.020 - 02.028	8.00
02.021		Counselling office, 2	From 02.020 - 02.028	8.00
02.022		Counselling office, 3	From 02.020 - 02.028	8.00
02.023		Counselling office, 4	From 02.020 - 02.028	8.00
02.024		Counselling office, 5	From 02.020 - 02.028	8.00
02.025		Counselling office, 6	From 02.020 - 02.028	8.00
02.026		Counselling office, 7	From 02.020 - 02.028	8.00
02.027		Counselling office, 8	From 02.020 - 02.028	8.00
02.028		Counselling office, 9	From 02.020 - 02.028	8.00

Last modified: **November 04 2019 01:20 PM**

Details

Typical Program Area:	**8.00**
Description:	**02- Administration, Health, Counselling & International Education**
Notes:	

Room Design Requirements

General Design Requirements

Activities and Functions

- Individual office for Counselor all Itinerant Staff, incl. Career Ctr.; requires confidentiality
- Space to meet with up to 2-3 people (note larger group meetings to occur in conference/meeting room 12.3.1)

Occupancy

Capacity	*3*

Daylighting

☑ *Direct*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Carpet Tile*

Ceiling Finishes

Ceiling Characteristics	*ACT*

Wall Finishes

Wall Characteristics	*Painted Wall*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(1) 1200x1200*
Tackboard	☑ *(1) 1200x1200*
Computer	☑ *One (1) Computer Workstation (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Workstation with lockable vertical file storage (storage for keys, purse, files) (OSOI)
2. One (1) Office Chair (OSOI)
3. Three (3) Visitor chairs (OSOI)
4. One (1) Book Shelf (OSOI)
5. One (1) Sideboard storage (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Department:	**02 - Administration, Health, Counselling & International Education**
Minimum Area:	**15.50**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Waiting room can accommodate up to 5 - 6 people in waiting area
- The reception staff sits at the front reception desk and acts as the primary contact with students and visitors

Critical Adjacencies

- The reception desk millwork must be the first line of contact from the entry doors into the main Administration area
  - Visual access from main circulation into the reception area
  - The open office workstations are to be located immediately adjacent to it, so staff can quickly go up to the reception when visitors arrive. These must be considered as one large open space.
- Guests visiting the Principal and VPs need to flow through the front reception desk first before they are directed to the private offices.

Additional Remarks

- (6) Visitor chairs
- (1) Coffee table
- Computer (receptionist desk)
- Report card wooden cabinet (existing)

Occupancy

Capacity	*6*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Carpet Tile*

Ceiling Finishes

Ceiling Characteristics	*ACT*

Wall Finishes

Wall Characteristics	*Painted GWB*

Equipment and Accessories

Room Accessories

Tackboard	☑ *1200 x 2400*
Computer	☑ *One (1) Computer Workstation (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Four (4) visitor chairs in waiting area (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty *3*

- (1) to be at reception desk

Other Duplex Min. Qty

See General Power requirement above

Other

Clocks ☑

Communication Requirements

Communication Systems

Telephone ☑ *CAT6 Drop Min Qty: 2*
Data ☑ *CAT6 Drop Min Qty: 4*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door* ☑ *Other*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N*☑
Window Covering *RS - Roller Shade*
Window Covering Notes *RS- Roller Shade (exterior and internal glazing)*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
028	Reception Desk	1	Yes	CSCI

Note: Include barrier free accessible height counter area

Department:	**02 - Administration, Health, Counselling & International Education**
Minimum Area:	**8.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Accommodate 1 workstation

Critical Adjacencies

- Accessed from the school public corridor, but adjacent to the Counselling area

Occupancy

Capacity	*1*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Computer	☑ *One (1) Computer Workstation (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Desk (OSOI)
2. One (1) Office chair (OSOI)
3. Three (3) visitor chairs (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*2*
Other Duplex Min. Qty	See General Power requirement above

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 6*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N*☑
Window Covering Notes *RS- Roller Shade (exterior and internal glazing)*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
003	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
Note: With countertop				
033	Tall Open Wall Shelving	1	Yes	CSCI
052	Wall Hung Upper Cabinet open w/ Shelves	1	Yes	CSCI

Administration/Counselling Suite Gross Up Room No. 02.031

Department:	**02 - Administration, Health, Counselling & International Education**
Minimum Area:	**41.50**
Ceiling Height:	**2750.00**

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

Lighting

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

03

Multi Purpose

Department:	**03 - Multi Purpose**
Minimum Area:	**277.50**
Ceiling Height:	

Room Design Requirements

General Design Requirements

Activities and Functions

- Can accommodate students in various informal seating arrangements, and some round/group tables, some soft seating

Design Features

- Ceiling height will be double height

Additional Remarks

- Acoustics to accommodate multipurpose use: Drama performance, Fashion show, Community Events, Speakers, Dance Show, Concerts, School assemblies, PE activities
- No social stairs, no conversation pits
- Sound system connection
- Picture rails to display art
- Ceiling to have provision for suspending art work
- Provide large folding and stackable walls along perimeter to allow space to be transformed for art shows
- Requires access afterhours
- Directly adjacent to Auditorium to permit use as crush space/lobby before and after performances, during intermissions

Occupancy

Capacity	*500*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Polished Concrete*

Equipment and Accessories

Room Accessories

Long Throw Projector (OSOI)	☑ *Two (2) c/w Pull-down projection screens*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Four (4) microwaves, in groups of 2 with distance between the groups to accommodate large volumes of use and line ups (OSOI)
2. Four (4) vending machines (OSOI)
3. Mobile foldable bench and table (OSOI)

Plumbing Requirements

Water supply

Cold Water (potable)	☑

Fixtures

Water Fountain	☑

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*Provide exhaust ventilation to microwaves area*
Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*20*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 14*
Remarks	*(1) CAT6 Drop for each vending machine*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Double doors - Minimum 915 mm (leaf) - Wood doors - Sidelight 1.5m wide - Accessible door at main entrance door will be automatic swing door*

Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*

Internal Glazing *Y/N*☑

Window Covering Notes *RS- Roller Shade (exterior and internal glazing)*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
002	Base Cabinet Open for Recycling Bins	1	Yes	CSCI
031	Tall Display Cabinet w/ Adjustable Shelves	1	Yes	CSCI

Department: **03 - Multi Purpose**

Minimum Area: **0.00** *Ceiling Height:* **2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Enclosed space for table storage

Additional Remarks

- VSB Question: Enclosed space for storage of XX tables required, area taken from building gross up.

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Epoxy coated*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

HVAC Requirements

HVAC

Minimum Temp (C)	*19*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door*☑

Department:	**03 - Multi Purpose**
Minimum Area:	**60.00**
Ceiling Height:	**3050.00**

Room Design Requirements

General Design Requirements

Additional Remarks

- VSB Question: Kitchen consultant to provide details.

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Non slip commercial foodservice grade*

Ceiling Finishes

Ceiling Characteristics	*ACT, acoustic mylar washable*

Wall Finishes

Wall Characteristics	*Ceramic Tile or FRP (embossed/pebble finish)*

Equipment and Accessories

Sink Accessories

Soap Dispenser	☑
Paper Towel Dispenser	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Refer to Servery Equipment Appendix

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑
Notes	☑ *RPBP piping to be concealed in wall or in an enclosure with removable access panel viewing window. Exposed installation will not be acceptable.*

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required
- Provide minimum two (2) duplex above each counter on dedicated circuit

Duplex Min. Qty	*12*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 2*
Remarks	*Provide one (1) data drop for point of sale system*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks *Man-door width min 42"*
Other Doors *Man-door* ☑ *Other* ☑ *Rolling Grille*

Department:	**03 - Multi Purpose**
Minimum Area:	**28.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Additional Remarks

- VSB Question: Kitchen consultant to provide details.

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Non slip commercial foodservice grade*

Ceiling Finishes

Ceiling Characteristics	*ACT, acoustic mylar washable*

Wall Finishes

Wall Characteristics	*Ceramic Tile or FRP (embossed/pebble finish)*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Metal shelving (6-8) as per final layout (CSCI)

HVAC Requirements

HVAC

Minimum Temp (C)	*19*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door*☑

04
Fine Arts

Last modified: **November 04 2019 01:21 PM**

Details

Typical Program Area: **100.00**
Description: **04- Fine Arts**
Notes:

Room Design Requirements

General Design Requirements

Activities and Functions

- 30 individual student stations (tall movable desks)

Critical Adjacencies

- Located on level 1 (to be confirmed)
- Outdoor access required for each art studio for class to open to outdoors and direct access for activities like outdoor sketching
- Direct access to Art Studio 2, Art Studio storage, and Ceramics Studio

Additional Remarks

- Drying racks must fit inside studios not in corridors for security of student projects
- Locate display cases outside of Art Studios in corridors for displaying student work.
- WIP storage will be open adjustable shelves 2100mm wide. Alternative furniture system allowed.

Occupancy

Capacity	*30*

Daylighting

☑ *Direct*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(2)1200 x 2400*
Tackboard	☑ *(2)1200 x 2400*
Short Throw Projector (OSOI)	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Thirty (30) Folding art horses (OSOI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Other	☑ *(2) Size large art sinks with catch basin, located far apart in room. Sink to have 4 faucets. Art sinks to be one-piece integral stainless steel w/ integral stainless steel backsplash. Backsplash height to be min. 400mm.*

Sink Mounting

Counter	☑

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*Located above drying rack to remove paint fumes etc. Provide local on/off switch with BMS control.*
Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty: *6*

Other Duplex Min. Qty: See General Power requirement above

Retractable Overhead Duplex Min. Qty (industrial grade): *2*

- (2) Overhead retractable power cords in center of room to power glue guns, hair dryers, lights and other items

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 8*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Dimmer ☑ *Overhead track lighting (locate in middle of the room)*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide - Overhead exterior door*

Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*

Window Covering Notes *RS- Roller Shade*

Millwork Schedule

Item No.	Item Name	Qty	To be Modeled	Responsibility
06.4000.003	Base Cabinet w/ Lockable Double Doors & Adjustable Shelves	1	Yes	CSCI
	Note: with countertop, located at room perimeter below windows			
06.4000.0415	Tall Storage Cabinet w/ Lockable Double Doors and Shelves	1	Yes	CSCI
06.4000.0431	Tall Open Wall Shelving- Art Studio	1	Yes	CSCI
06.4000.0432	Wall Hung Pegboard	1	Yes	CSCI
	Existing Equipment			
Item No.	**Item Name**	**Qty**	**To be Modeled**	**Responsibility**
00.1268	Light Table	1	No	OSOI
00.1270	Drying Rack/Storage Unit	1	No	OSOI
00.1271	Print Roller Machine #1	1	No	OSOI
00.1275	Print Roller Machine #2	1	No	OSOI
00.1276	Industrial Paper Cutter	1	No	OSOI

Templated Rooms:

Room Function No.	Room No.	Room Name	RDS Status	Program Area
04.01.001		Art Studio, 2	From 04.01.001 - 04.01.002	100.00
04.01.002		Art Studio, 1	From 04.01.001 - 04.01.002	100.00

Department: **04 - Fine Arts 01 - Art**

Minimum Area: **30.00** *Ceiling Height:* **2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Supply storage; vertical & horizontal paper storage; paint/supply storage, still life objects etc.

Design Features

- Provide 3m width
- Access from each art studio, door to be centered on the long side.

Additional Remarks

- One wall to have 1m deep shelving to have 10x250mm high fixed cubbies with and remainder shelving to be adjustable.
- Opposite wall to have 620mm deep open shelving , part of the shelving to be counter with shelving above. Counter with outlets for charging items such as drills, etc.

Occupancy

Capacity	*1*

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

HVAC Requirements

HVAC

Minimum Temp (C)	*19*

Electrical Requirements

Power

Duplex Min. Qty	*6*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors*
Other Doors *Man-door*☑

Millwork Schedule Unique

Art Studio Storage
Room No. 04.01.003

BIM ID	Item Name	Qty	To be Modeled	Responsibility
036	Tall Open Wall Shelving, Narrow-Art Studio	1	Yes	CSCI

Ceramic Studio, Equipment & Storage
Room No. 04.01.004

Department: **04 - Fine Arts 01 - Art**

Minimum Area: **55.00** *Ceiling Height:* **4300.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Adjacent to outdoor

Design Features

- Enclosed area for 3 kilns
- Direct access to one of the studios if not both.
- Rooms Ceramic studio and Ceramic Equipment & Storage to be combined. i.e. 55sm in total
- Clay storage (accommodated in the millwork)
- Tools and equipment storage
- Accommodate pottery wheels (4)

Additional Remarks

- The kiln must be located along an exterior wall or consider placing this in a separate structure.

Occupancy

Capacity	*6*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Sealed Concrete*

Ceiling Finishes

Ceiling Characteristics	*ACT*

Wall Finishes

Wall Characteristics	*Painted GWB*

Equipment and Accessories

Sink Accessories

Soap Dispenser	☑
Paper Towel Dispenser	☑

Room Accessories

Whiteboard	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Slab roller (OSOI)

Plumbing Requirements

Sink Types

Double	☑ *Qty: 1*

Sink Mounting

Counter	☑

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*Exhaust from kiln area to remove heat and fumes and prevent heat and fumes affecting adjacent spaces.*
Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required
- Overhead electrical receptacles for Ceramic Wheels

Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 8*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N*☑
Window Covering *RS - Roller Shade*
Window Covering Notes *RS- Roller Shade (exterior and internal glazing)*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
003	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
	Note: - With wood countertop - Along one wall			
050	Wall Hung Pegboard w/ Lockable Doors	2	Yes	CSCI
	Note: - 2 units in room			
052	Wall Hung Upper Cabinet open w/ Shelves	1	Yes	CSCI
	Note: - Along one wall			

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0894	Shelving Unit #1	2	No	OSOI
0897	Yellow Cabinet	1	No	OSOI
0955	Ceramic Wheels	4	No	OSOI
0960	Kiln #1	1	No	OSOI

Ceramic Studio, Equipment & Storage
Room No. 04.01.004

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0961	Kiln #2	1	No	OSOI
0962	Kiln #3	1	No	OSOI
0963	Chemistry Storage Cabinet	1	No	OSOI
0964	Pugger	1	No	OSOI
0965	Roller Table	1	No	OSOI
0966	Drying Rack	1	No	OSOI

Graphic Arts & Photography Lab Room No. 04.01.006

Department:	**04 - Fine Arts 01 - Art**		
Minimum Area:	**75.00**	*Ceiling Height:* **3050.00**	

Room Design Requirements

General Design Requirements

Design Features

- Green screen
- Designated area with sink and counter for film processing

Additional Remarks

- Ability to accommodate future film program with green wall and a recording room

Occupancy

Capacity	*30*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Short Throw Projector (OSOI)	☑
Computer	☑ *Thirty-one (31) Computer Workstation (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Table mobile for 30 computers (OSOI)
2. Thirty (30) Student Chair (OSOI)
3. One (1) Office Chair (OSOI)
4. One (1) Teacher Desk (OSOI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Other	☑ *One long sink for film processing, corrosive material, sink to have non spill lip*

Sink Mounting

Counter	☑

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*Exhaust from film processing area to remove fumes. Local on/off switch with BMS control.*
Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*6*
Other Duplex Min. Qty	
	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 38*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door* ☑ *Other*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N*☑
Window Covering Notes *RS- Roller Shade (exterior and internal glazing)*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
003	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
	Note: With countertop 50% of total			
005	Base Cabinet w/ Lockable Double Doors & Adjustable Shelves	1	Yes	CSCI
	Note: With countertop 50% of total			

Department: **04 - Fine Arts 01 - Art**

Minimum Area: **35.00** *Ceiling Height:* **3050.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Direct access through Graphic Arts and Photography Lab
- Separate control for each safe light.
- Three separate safe light fixtures ceiling mounted with ability to adjust the illumination.
- Separate control for regular light (i.e. to clean the room)

Design Features

- Film processing area
- Dark cubicle for film processing with a counter either to have a curtain or a door, cubicle to be pitch dark.
- Film paper drawers to be light tight
- Storage on one of the walls
- No glazing in this room

Occupancy

Capacity	*15*

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Ceiling Finishes

Ceiling Characteristics	*Black ACT*

Wall Finishes

Wall Characteristics	*Walls to be matt black painted GWB*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Other	☑ *Large sink in the middle of room*

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*Exhaust to maintain room at negative pressure relative to corridor.*
Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty *4*

Other Duplex Min. Qty

See General Power requirement above

Communication Requirements

Communication Systems

Data ☑ *CAT6 Drop Min Qty: 4*

Lighting

Luminaire Type

LED ☑

Other ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Multi-Level ☑

Room Design - Door & Window Requirements

Doorsets

Other Doors *Other* ☑ *Rotatable dark room door.*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
020	Work Surface w/ Cubicles	15	Yes	CSCI

Note: 15 stations, to hold 15 enlargers

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0924	Dark Room Enlarger #1	2	No	OSOI
0925	Dark Room Enlarger #2	9	No	OSOI

Department:	**04 - Fine Arts 01 - Art**		
Minimum Area:	**15.00**	*Ceiling Height:* **2750.00**	

Room Design Requirements

General Design Requirements

Activities and Functions

- Refer to General PDC

Additional Remarks

- Refer to diagram in Section 2.0 for PDC typologies

Occupancy

Capacity	*8*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Whiteboard	☑
Computer	☑ *Two (2) Computer Workstation (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Kettle (OSOI)
2. One (1) tables (OSOI)
3. Office chairs (6-8 people) (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Above counter outlets for microwave and kettle
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*7*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 6*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 600mm wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N*☑
Window Covering *RS - Roller Shade*
Window Covering Notes *RS - Roller Shade (exterior and internal glazing)*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
003	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
Note: With counter, Type-1, provided instead of tall cabinet				
021	General Work Surface	1	Yes	CSCI
039	Tall Storage Cabinet w/ Lockable Doors and Whiteboard	1	Yes	CSCI
Note: Type-2, provided instead of upper cabinets & Lower Cabinets. Total millwork width: 1800 mm				
052	Wall Hung Upper Cabinet open w/ Shelves	1	Yes	CSCI
Note: 50% uppers open, Type-1, provided instead of tall cabinet				
058	Wall Hung Upper Cabinet Lockable w/ Double Doors & Shelves	1	Yes	CSCI
Note: 50% uppers lockable, Type-1, provided instead of tall cabinet				

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0883	Fridge	1	No	OSOI
0917	Microwave	1	No	OSOI
0919	Printer	1	No	OSOI

Department:	**04 - Fine Arts 02 - Dance**		
Minimum Area:	**200.00**	*Ceiling Height:* **5485.00**	

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Requires direct access to Dance Studio Storage
- Locate on main level on school

Design Features

- Room dimension to have a ratio of 4:6 to allow for greater horizontal movement in one direction and allow greater visibility of students to mirrors
  - Long side of room to have mirrors (7' high), the opposite side to have ballet bar
  - Short side of room to have whiteboard, opposite side to have millwork storage for costumes and accommodate AVIT equipment for speakers
- Ceiling Height to be minimum 5485 mm to accommodate dance lifts
- Storage for student bag and shoes
- Track lighting for performance along the long side of room.
- Provide directional track lighting two rows along the long side of room
- Provide clerestory glazing with motorized blackout roller shades at exterior walls. Glazing to be above the top level of all mirrors, and to be a minimum of 25% of area of exterior wall above top level of mirrors and below ceiling height. Glazing to be minimum of 1.22m in height.

Additional Remarks

- Sprung floor required

Occupancy

Capacity	*30*

Daylighting

☐ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*- Loud space, provide acoustic rating to adjacent programs Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Wood*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *1200x2400*
Audio Input Station	☑ *(4)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Sound system (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Black out roller shades for clerestory windows
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 10*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Multi-Level	☑
Dimmer	☑

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable Clearstory windows, no visual access to exterior required. Clearstory windows to be on same wall as ballet bar.*
Internal Glazing *Y/N*☑
Window Covering *RS - Roller Shade*
Window Covering Notes *RS- Roller Shade (exterior and internal glazing)*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
051	Wall Hung Recessed Cubbies	30	Yes	CSCI

Department: **04 - Fine Arts 02 - Dance**

Minimum Area: **15.00** *Ceiling Height:* **3050.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Requires direct access from Dance Studio

Additional Remarks

- Required in addition to the millwork costume storage inside the Dance studio for larger items

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Sound System (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*19*

Electrical Requirements

Power

Duplex Min. Qty	*1*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Double-doors to accommodate loading of equipment and movement of piano - Wood door*
Other Doors *Man-door*☑

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
021	General Work Surface	1	Yes	CSCI

Department:	**04 - Fine Arts 03 - Drama**		
Minimum Area:	**209.00**	*Ceiling Height:*	

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Locate on main school level.
- Location is to be directly connected to School Commons to allow use of multi-purpose as an intermission space or crush space before and after performances, food area for intermissions and a space for ticket booth line up.
- Change rooms require adjacency/ access to stage.

Design Features

- Main Entrance must be located at stage level.
- Main entrance to have vestibule (for sound and light transition for entering/exiting)
- Second entrance to be located on top tier.
- Wheelchair accessible for both students and audience members
- Provide full height curtain and curtain track per typology diagram 1: Drama Studio in Appendix 1A - Functional Program
- Tiered seating (straight not curved). Seating to be carpeted and 915 mmm wide and 610 mm high each tier. Provide four tiers. Top tier must accommodate permanent seating for elderly audiences.
- Sound/Lighting Booth at back of tiered seating and centered in room
- Stage at front to have wood floor that can be painted and nailed into for sets
- Accommodates up to 60 audience seated for a performance
- Provide pipe grid ceiling above the stage
- Locate all ducts and lights 100mm clear above pipe grid ceiling.
- Storage under tiered seating must be provided for space efficiency
- Provide aisle lighting at the access aisle/path in tiered seating.
- Ceiling height will be high to accommodate tiered seating and control booth in relation to the stage

Occupancy

Capacity	*90*

Acoustics

Acoustic Requirements

Comments	*- Acoustic treatment and a sound/light lock before entering the space is required. - Ensure sound attenuation between green room, changeroom and Drama Studio - Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Wood for stage Carpet for tiers (custom carpet colour to be coordinated with users)*

Ceiling Finishes

Ceiling Characteristics	*Black ACT*

Wall Finishes

Wall Characteristics	*Black walls with acoustic treatment such that acoustic treatment below 2100mm is robust to activity and easy to clean. Provide picture rail around three sides excluding stage for picture hanging.*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *1200x2400*
Tackboard	☑ *(2) Near at each entrance*
Audio Input Station	☑ *(4) One to be located in sound booth*
Other	☑ *Automatic ceiling mounted projector screen*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Two (2) Theatre Curtain on ceiling mounted track full theatre width & theatre height (CSCI)

2. Four (4) Theatre Curtain on ceiling mounted track 3.5m wide & theatre height (CSCI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Electrical outlets will be provided on the riser side of tiers
- Black out roller shades for clerestory windows
- Provide a grid of 8 in-floor electrical outlet boxes in stage area with sturdy covers for heavy traffic flush to the finished floor

Duplex Min. Qty	*8*
Other Duplex Min. Qty	*20*

- Twelve (12) above pipe ceiling grid
- Eight (8) in-floor

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 10*

Lighting

Luminaire Type

LED	☑
Indirect	☑
Other	☑ *Studio lighting*

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Multi-Level	☑
Dimmer	☑

Room Design - Door & Window Requirements

Doorsets

Remarks - *Double doors to allow movement of equipment. Sound/ light lock before entering room. - Minimum 915 mm - Wood doors - Sidelight 1.5m wide*

Other Doors *Man-door*☑

Green Room & Drama Storage A
Room No. 04.03.003

Department: **04 - Fine Arts 03 - Drama**

Minimum Area: **20.00** *Ceiling Height:* **3050.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- This room functions as both a green room and a bookroom for storage.

Design Features

Occupancy

Capacity	*6*

Daylighting

☐ *Direct* ☐ *Indirect* ☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Couch (OSOI)
2. Six (6) Chairs (OSOI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Other	☑ *Industrial large sink*

Sink Mounting

Counter	☑

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

Duplex Min. Qty	*3*
Other Duplex Min. Qty	*2*

- GFI - receptacles near sink

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 2*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Two doors - one to the corridor and one to the drama studio. - Sidelight to the door from corridor - Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door* ☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N* ☑
Window Covering Notes *RS- Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
004	Base Cabinet w/ Double Doors & Adjustable Shelves	1	Yes	CSCI
	Note: With countertop			
055	Wall Hung Upper Cabinet w/ Double Doors & Shelves	1	Yes	CSCI

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0916	Mini Fridge	1	No	OSOI

Department: **04 - Fine Arts 03 - Drama**

Minimum Area: **8.00** *Ceiling Height:* **3050.00**

Room Design Requirements

General Design Requirements

Additional Remarks

- Storage

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

HVAC Requirements

HVAC

Minimum Temp (C)	*19*

Electrical Requirements

Power

Duplex Min. Qty	*2*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm*

Other Doors *Man-door*☑

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
040	Tall Storage Cabinet w/ Lockable Double Doors and Shelves	1	Yes	CSCI

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0905	Closet	1	No	OSOI
0908	Filing Cabinet #1	1	No	OSOI
0912	Cabinet #5	3	No	OSOI
0913	Sound System	1	No	OSOI

Department:	**04 - Fine Arts 03 - Drama**		
Minimum Area:	**8.00**	*Ceiling Height:* **3050.00**	

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Centered in Drama Studio, Elevated above last tiered step for unobstructed view to stage (~610mm above last tier)

Design Features

- Provide accessibility.
- Lockable AV station for lighting and audio/video controls

Occupancy

Capacity	*1*

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Carpet*

Wall Finishes

Wall Characteristics	*Black painted room*

Wall Protection

Types	*GWB*

Equipment and Accessories

Room Accessories

Long Throw Projector (OSOI)	☑
Audio Input Station	☑ *(1)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. AV equipment (OSOI)
2. One (1) Chair (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*4*
Other Duplex Min. Qty	See General Power requirement above

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 4*
Remarks	*- Sound system*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Two doors - one to the corridor and one to the drama studio. - Minimum 915 mm*
Other Doors *Man-door*☑

Windows

Internal Glazing *Y/N* ☑ *Type Clear glazing to stage*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
015	Computer Work Surface	1	Yes	CSCI
	Note: ADA accessible			
040	Tall Storage Cabinet w/ Lockable Double Doors and Shelves	1	Yes	CSCI
	Note: on opposite wall from computer work surface			

Department:	**04 - Fine Arts 04 - Music**		
Minimum Area:	**200.00**	*Ceiling Height:* **4300.00**	

Room Design Requirements

General Design Requirements

Activities and Functions

- Can accommodate up to 80 music students (including music stands, instruments and flexible chairs)

Critical Adjacencies

- Locate on main school level

Design Features

- Large open space with flat floor (not tiered)
- Space for teacher desk at front with teacher's podium/ stand/ workstation
- Angled walls not necessary
- Provide clerestory glazing with motorized blackout shades at exterior walls. Glazing to be above the level of doors and storage cabinets. Glazing to be a minimum of 25% of the area of exterior wall above top level of doors and storage cabinets and below ceiling height. Glazing to be minimum 1.22m in height

Occupancy

Capacity	*80*

Daylighting

☐ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*- Provide materials and finishes to aid in sound absorption and sound deflection in room to provide appropriate level of acoustics for band. - Acoustic separation between the music rooms and music practice rooms is required as well as acoustic separation from the music department rooms to the rest of the school. - Ceiling to be treated for acoustics with acoustic panel - Wall above door/millwork height to have acoustic dense foam panels - Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Ceiling Finishes

Ceiling Characteristics	*Acoustic paneling*

Wall Finishes

Wall Characteristics	*Acoustic dense foam above door/millwork height*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(4) 1200 x 2400*
Tackboard	☑ *(1) 1200x2400*
Short Throw Projector (OSOI)	☑
Audio Input Station	☑ *(4)*
Computer	☑ *One (1) Computer Workstation (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Thirty (30) Student Chair (OSOI)
2. One (1) Office Chair (OSOI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Fixtures

Notes

Sink Types

Other	☑ *Large deep sink Size 370mm x 1075mm x 450mm deep*

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty *12*

- equally spaced along the three walls

Other Duplex Min. Qty

See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 10*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm (leaf) - Wood doors - Sidelight 1.5m wide - Double without the vertical middle stile and door to have sound seal.*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N* ☑ *Type Glazing from music rooms to main corridor must have acoustic ratings. Refer to the sound transmission rating appendix of the Statement of Requirements.*
Window Covering *RS- Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
004	Base Cabinet w/ Double Doors & Adjustable Shelves	1	Yes	CSCI
Note: With countertop, located at work counter for instrument repair, 2' x 10'				
005	Base Cabinet w/ Lockable Double Doors & Adjustable Shelves	1	Yes	CSCI
Note: With countertop				
026	Mobile Shelving	1	Yes	CSCI
042	Tall Storage Cabinet w/ Lockable Drawers and Whiteboard, wide	1	Yes	CSCI
Note: full perimeter of one wall				

Existing Equipment Unique				
BIM ID	**Item Name**	**Qty**	**To be Modeled**	**Responsibility**
0935	Cabinet #6	1	No	OSOI
0936	Speaker #3	1	No	OSOI
0937	Keyboard #1	1	No	OSOI
0938	Xylophone	1	No	OSOI
0939	Piano	1	No	OSOI
0940	Speaker #4	1	No	OSOI
0941	Amp #1	1	No	OSOI
0942	Drums #1	1	No	OSOI
0943	Drum Set on Mobile Stand	1	No	OSOI
0945	Wind Pipes	1	No	OSOI
0946	Xylophone #2	1	No	OSOI
0947	Drums #2	1	No	OSOI
0949	Drum #3	4	No	OSOI
1005	Cabinet #8	1	No	OSOI
1008	Sheet Music Holder	2	No	OSOI
1009	Cabinet #9	2	No	OSOI
1010	Grand Piano	1	No	OSOI

Department:	**04 - Fine Arts 04 - Music**
Minimum Area:	**130.00**
Ceiling Height:	**4300.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Can accommodate up to 40 music students (including music stands, guitars and flexible chairs)

Critical Adjacencies

- Locate on main school level

Design Features

- Large open space with flat floor (not tiered)
- Multiple entries
- Room must be as close to square as possible
- Space for teacher desk at front with teacher's podium/ workstation
- Provide clerestory glazing with motorized blackout shades at exterior walls. Glazing to be above the level of doors and storage cabinets. Glazing to be a minimum of 25% of the area of exterior wall above top level of doors and storage cabinets and below ceiling height. Glazing to be minimum 1.22m in height

Occupancy

Capacity	*40*

Daylighting

☐ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*- Provide materials and finishes to aid in sound absorption and sound deflection in room to provide appropriate level of acoustics for band. - Acoustic separation between the music rooms and music practice rooms is required as well as acoustic separation from the music department rooms to the rest of the school. - Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Ceiling Finishes

Ceiling Characteristics	*Acoustic paneling*

Wall Finishes

Wall Characteristics	*Acoustic dense foam above door/millwork height*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(3) 1200x2400*
Tackboard	☑ *1200x2400*
Short Throw Projector (OSOI)	☑
Audio Input Station	☑ *(4)*
Computer	☑ *One (1) Computer Workstation (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Thirty (30) Student Chair (OSOI)
2. One (1) Office Chair (OSOI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Other	☑ *Size 370x430x180 deep (min)*

Sink Mounting

Counter	☑

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*8*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 10*
Remarks	*-Projector located at front of room - Sound system with speakers - Powered Amplifier - DVD player*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm (leaf) - Wood doors - Sidelight 1.5m wide - Double without the vertical middle stile and door to have sound seal.*

Windows

Exterior Window Required ☑ ☑ *Operable Clearstory glazing*
Internal Glazing *Y/N* ☑ *Type Glazing from music rooms to main corridor must have acoustic ratings. Refer to the sound transmission rating appendix of the Statement of Requirements.*
Window Covering *RS- Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
004	Base Cabinet w/ Double Doors & Adjustable Shelves	1	Yes	CSCI
	Note: With countertop, located at work counter for instrument repair, 2' x 10'			
005	Base Cabinet w/ Lockable Double Doors & Adjustable Shelves	1	Yes	CSCI
	Note: With countertop			
018	Deep Open Storage, Instruments (TBD)	40	Yes	CSCI
	Note: For 40 violins, minimum 600 mm wide compartments			
026	Mobile Shelving	1	Yes	CSCI

BIM ID	Item Name	Qty	To be Modeled	Responsibility
042	Tall Storage Cabinet w/ Lockable Drawers and Whiteboard, wide	1	Yes	CSCI

Note: full perimeter of one wall

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0928	Speaker #1	2	No	OSOI
0929	Speaker #2	2	No	OSOI
0952	Filing Cabinet #2	7	No	OSOI
0954	Upright Bass Holder	1	No	OSOI
0973	Instrument Rack #1	1	No	OSOI
0974	Instrument Rack #2	2	No	OSOI
0975	Electric Drum Set	1	No	OSOI
0982	Keyboard #2	1	No	OSOI
0983	TV and Stand	1	No	OSOI
0985	Amp #2	1	No	OSOI
0986	Amp #3	2	No	OSOI
0987	Amp #4	1	No	OSOI
0988	Amp #5	1	No	OSOI
0990	Guitar Case	2	No	OSOI

Department:	**04 - Fine Arts 04 - Music**		
Minimum Area:	**95.00**	*Ceiling Height:* **4300.00**	

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Locate on main school level

Design Features

- Temporary standing choral risers to accommodate a minimum of 50 students, 4 tiers minimum
- Ensure height of room can accommodate four tiers of temporary risers and not have students able to reach the lights or ceiling structure
- Room must be as close to square as possible
- Teacher station at front of room
- Space at front to accommodate Grand piano
- Provide clerestory glazing with motorized blackout shades at exterior walls. Glazing to be above the level of doors and storage cabinets. Glazing to be a minimum of 25% of the area of exterior wall above top level of doors and storage cabinets and below ceiling height. Glazing to be minimum 1.22m in height

Occupancy

Capacity	*50*

Daylighting

☐ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*- Acoustic separation between the music rooms and music practice rooms is required as well as acoustic separation from the music department rooms to the rest of the school. - Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *1200 x 2400*
Tackboard	☑ *1200x2400*
Short Throw Projector (OSOI)	☑
Audio Input Station	☑ *(4)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Thirty (30) Student Chair (OSOI)
2. One (1) Office Chair (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty *6*
Other Duplex Min. Qty

See General Power requirement above

Other

Clocks ☑

Communication Requirements

Communication Systems

Telephone ☑ *CAT6 Drop Min Qty: 1*
Data ☑ *CAT6 Drop Min Qty: 8*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm (leaf) - Wood doors - Sidelight 1.5m wide - Double without the vertical middle stile and door to have sound seal. - Double door wide enough to move Grand Piano*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable Clearstory glazing*
Internal Glazing *Y/N* ☑ *Type Glazing from music rooms to main corridor must have acoustic ratings. Refer to the sound transmission rating appendix of the Statement of Requirements.*
Window Covering *RS - Roller Shade*

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0989	Choir Risers (Folded)	4	No	OSOI
1011	Choral Stand	1	No	OSOI

Department: **04 - Fine Arts 04 - Music**

Minimum Area: **40.00** *Ceiling Height:* **3050.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Located between Music room (strings) and Music room (band)

Additional Remarks

- MUSIC – The EHSS owned instruments in storage units must accommodate:
- 40 Guitars
- 40 Violins
- 20 Chellos
- 1 Upright Bass

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

Other Duplex Min. Qty	*4*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm*
Other Doors *Man-door* ☑

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
003	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
019	Deep Open Storage, Physical Education (TBD)	1	Yes	CSCI
026	Mobile Shelving	1	Yes	CSCI

Last modified: **May 29 2019 12:32 AM**

Details

Typical Program Area:	**6.00**
Description:	**04- Fine Arts**
Notes:	

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Visible access from main Band or Strings or Choral room for supervision
- Locate five music practice rooms with access directly from music room (2 from band, 2 from strings, 1 from choral). The rooms are not required to be adjacent to each other, however, they must be within the music department area.
- Locate on Level 1

Design Features

- Accommodate between 1-5 students
- Accommodate an upright piano
- No tables, but flexible chairs are required

Additional Remarks

- Two of the music practice rooms must have direct adjacency to allow for a future recording studio, otherwise, the appropriate AVIT equipment must be provided to allow for recording between the two rooms.

Occupancy

Capacity	*5*

Daylighting

☑ *Indirect*

Acoustics

Acoustic Requirements

Comments	*-Attention to acoustic attenuation in these rooms and have acoustic wall paneling and ceiling treatment. - Acoustic separation between the music rooms and music practice rooms is required as well as acoustic separation from the music department rooms to the rest of the school. - Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Ceiling Finishes

Ceiling Characteristics	*Acoustic panel*

Wall Finishes

Wall Characteristics	*Acoustic dense foam above door/millwork height*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Chair (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

Duplex Min. Qty	*2*

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 2*
Remarks	*AV for recording*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 600mm wide*
Other Doors *Man-door*☑

Windows

Internal Glazing *Y/N* ☑ *Type Glazing from music rooms to main corridor must have acoustic ratings. Refer to the sound transmission rating appendix of the SOR*
Window Covering *RS - Roller Shade*

Templated Rooms:

Room Function No.	Room No.	Room Name	RDS Status	Program Area
04.04.005		Music practice room, 1	From 04.04.005 - 04.04.009	6.00
04.04.006		Music practice room, 2	From 04.04.005 - 04.04.009	6.00
04.04.007		Music practice room, 3	From 04.04.005 - 04.04.009	6.00
04.04.008		Music practice room, 4	From 04.04.005 - 04.04.009	6.00
04.04.009		Music practice room, 5	From 04.04.005 - 04.04.009	6.00

05
Athletics

Department:	**05 - Athletics**
Minimum Area:	**788.00**
Ceiling Height:	**7340.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Directly adjacent to PE storage

Design Features

- Not FIBA keys use Canadian standards
- 32.6 m x 24.2 m space
- Retractable bleacher seating on one side of Main Gym (total 350 seats configured as two sets of 175 seats. Refer to Schedule 1); Bleachers must be retractable into wall pocket so volleyball court lines are not impeded
- 1 Full Basketball Court (2 motorized drop hoops). Size shall be 28 m x 15 m clear to the inside of the perimeter lines, with minimum 1.83 m base line run-offs.
- 2 Cross Basketball Court (4 motorized drop hoops)
- 6 Badminton Courts
- 1 Full Volleyball Court plus (2) cross volleyball court. The central volleyball court should be perpendicular to the 2 cross volleyball courts. This will allow for full volleyball games with bleachers fully extended. Provide Volleyball posts and floor sockets for all Volleyball Courts.
- (2) Recessed, rigid, retractable accordion room dividers to divide space into 2 (pockets to be hidden and not impede clear space of gym). Provide person door in the partition.
- Lighting controls and outlets to be on opposite wall from bleachers, two sets on either side of the dividers.
- Digital score board
- All sharp corners must have padding
- (4) Hand ball crease (location and size to be confirmed with users)
- Verify court line locations and colours with users
- At each basket ball key provide 1800h wall padding length of the basketball key on wall behind.
- Provide protection for all electrical devices
- Provide exterior glazing at minimum of 25% of exterior walls as measured from finish floor elevation to clear ceiling height. Glazing is to be provided with blackout roller shades. A minimum of 75% of glazing is to provide diffuse natural light. Non-diffuse glazing shall not introduce glare or direct beams of light on activity areas.

Additional Remarks

- Requires access afterhours

Occupancy

Capacity	*350*

Daylighting

☐ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Wood gym floor with oil-based sealant*

Ceiling Finishes

Ceiling Characteristics	*Exposed*

Wall Finishes

Wall Characteristics	*VSB standard*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(2) 1200x2400 one for each divided space*
Long Throw Projector (OSOI)	☑ *(2) ceiling mounted c/w caged protection*
LCD Screen	☑ *(2) (OSOI) (rough-in for future power & data connections)*
Audio Input Station	☑ *(4)*
Other	☑ *(2) drop down motorized projection screen*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Digital score board (CSCI)
2. Four (4) Shot Clocks (CSCI)
3. Sound system (CSCI)
4. Two (2) LCD Screen (OSCI)
5. Motorized retractable accordion room dividers (CSCI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*26*

Electrical Requirements

Power

General Power

- Two (2) Digital scoreboards
- Four (4) shot clocks
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required
-

Duplex Min. Qty	*14*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 2*
Data	☑ *CAT6 Drop Min Qty: 12*
Remarks	*Rough-ins - Number of speakers will be provided as per SOR (audio to have two audio zone controls for each partitioned space)*

Lighting

Luminaire Type

LED	☑
Indirect	☑
Other	☑ *No pot lights, pendants. Natural light required (diffuse preferred)*

Lighting Control

	As per VSB Electrical Standards / ASHRAE Requirements
Dimmer	☑

Room Design - Door & Window Requirements

Doorsets

Remarks *Double doors*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable No direct daylighting- diffuse preferred*
Window Covering Notes *BRS- Blackout Roller Shade*

Last modified: **May 28 2019 05:03 PM**

Details

Typical Program Area: **30.00**
Description: **05- Athletics**
Notes:

Room Design Requirements

General Design Requirements

Activities and Functions

- Storage for sports equipment, includes lockable millwork along perimeter of storage room, open in middle for carts, bins of equipment

Critical Adjacencies

- Access from inside gym and access from exterior
- Directly adjacent one of the gyms

Design Features

- 2 Access points

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

HVAC Requirements

HVAC

Minimum Temp (C)	*19*

Electrical Requirements

Power

Duplex Min. Qty	*1*

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 2*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks *Double doors into storage rooms*

Millwork Schedule

Item No.	Item Name	Qty	To be Modeled	Responsibility
06.4000.0413	Deep Open Storage, Physical Education (TBD)	1	Yes	CSCI

Existing Equipment

Item No.	Item Name	Qty	To be Modeled	Responsibility
00.1304	Sit-Up Mat	25	No	OSOI

Item No.	Item Name	Qty	To be Modeled	Responsibility
00.1305	Ball Cart #1	3	No	OSOI
00.1306	Ball Cart #2	5	No	OSOI
00.1307	Soccer Net	6	No	OSOI
00.1308	Net Storage Unit	3	No	OSOI
00.1309	Large Mat	4	No	OSOI
00.1310	Ball/Net Game	2	No	OSOI
00.1311	Volleyball Net Stand	6	No	OSOI
00.1312	Griffin Sign	1	No	OSOI
00.1313	Mat	1	No	OSOI
00.1314	Ball Cart #3	1	No	OSOI
00.1315	Lacross Cart	1	No	OSOI
00.1336	Archery Target	5	No	OSOI
00.1337	Target Stands	5	No	OSOI
00.1338	Basketball Cart	2	No	OSOI
00.1339	Folded Tent	2	No	OSOI
00.1340	Basketball Throwing Machine	1	No	OSOI
00.1341	Ball Cart #4	1	No	OSOI
00.1342	Gymnastics Horse #1	1	No	OSOI
00.1343	Gymnastics Horse #2	1	No	OSOI
00.1344	Ball Cart #5	3	No	OSOI
00.1345	Table Tennis Tables (Folded)	8	No	OSOI
00.1346	Wresling Mat on roller	3	No	OSOI
00.1347	Hockey Bag	20	No	OSOI

Templated Rooms:

Room Function No.	Room No.	Room Name	RDS Status	Program Area
05.004		PE Storage, 1	From 05.004	40.00

Department:	**05 - Athletics**
Minimum Area:	**110.00**
Ceiling Height:	**3050.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- The weight room requires supervision and must be located on the same level as the gym and the gym PDC.
- directly adjacent to the Health & Fitness Studio with garage door or folding doors to open up for larger classes and events

Design Features

- Space to accommodate stationary weight machines including benches and sets of free weights

Occupancy

Capacity	*30*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Rubber*

Ceiling Finishes

Ceiling Characteristics	*Exposed*

Wall Finishes

Wall Characteristics	*Painted GWB*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(2) 1200x2400 on either side of the LCD TV*
LCD Screen	☑ *(OSCI)*
Coat Hook	☑
Mirror	☑ *- One mirror wall 300mm min AFF to avoid damage. Longest perimeter wall.*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*Adequate ventilation to meet cooling requirements and exhaust to maintain room at negative pressure relative to adjacent spaces.*
Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- No in floor receptacles
- Receptacles to be placed along perimeter walls
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*6*
Other Duplex Min. Qty	
	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 8*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide - Overhead interior door to be between Weight Room and Health & Fitness Studio*
Other Doors *Man-door* ☑ *Other* ☑ *Overhead Interior Door*

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N* ☑ *Type From main corridor into weight room*
Window Covering Notes *RS- Roller Shade*

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
1065	Elliptical Machine	2	No	OSOI
1067	Stationary Bikes	2	No	OSOI
1068	Rowing Machine	1	No	OSOI
1069	Weights Machine #1	1	No	OSOI
1070	Weights Machine #2	1	No	OSOI
1071	Weight Lifting Bench	4	No	OSOI
1072	Weight Rack #1	1	No	OSOI
1073	Weight Rack #2	2	No	OSOI
1074	Squat Rack #1	2	No	OSOI
1075	Squat Rack #2	1	No	OSOI
1076	Weight Holder	1	No	OSOI
1077	Pull Machine	1	No	OSOI

Department: **05 - Athletics**

Minimum Area: **85.00** *Ceiling Height:* **2750.00**

Room Design Requirements

General Design Requirements

Design Features

- The room shape should be contiguous without hidden corners to prevent vandalism and inappropriate student behavior.
- (2) individual changing cubicles
- All lockers to have alternating access if they are tiered on top of each other for easier access by students
- Finishes to be durable and easy to clean
- Accommodate fixed benches
- 2 showers

Occupancy

Capacity	*90*

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Tile*

Equipment and Accessories

Sink Accessories

Soap Dispenser	☑
Paper Towel Waste	☑
Air Dryer	☑

Room Accessories

Mirror	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. 90 half height locker in female home change room (to have alternating access if staked on top of each other) (CSCI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Lavatory	☑

Fixtures

WC	☑
Barrier Free WC	☑
Other	☑ *Showers*

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*Minimum 8 air changes per hour. Room to be negative relative to adjacent spaces.*
Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*4*
Other Duplex Min. Qty	*2*
	Above counter for hair dryer

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door* ☑

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
017	Counter, no base cabinet	1	Yes	CSCI

Department: **05 - Athletics**

Minimum Area: **85.00** *Ceiling Height:* **2750.00**

Room Design Requirements

General Design Requirements

Design Features

- The room shape should be contiguous without hidden corners to prevent vandalism and inappropriate student behavior.
- (2) individual changing cubicles
- All lockers to have alternating access if they are tiered on top of each other for easier access by students
- Finishes to be durable and easy to clean
- Accommodate fixed benches
- 2 showers

Occupancy

Capacity	*90*

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Tile*

Equipment and Accessories

Sink Accessories

Soap Dispenser	☑
Paper Towel Waste	☑
Air Dryer	☑

Room Accessories

Mirror	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. 90 half height locker in male home change room (to have alternating access if staked on top of each other) (CSCI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Lavatory	☑

Fixtures

Urinal	☑
WC	☑
Barrier Free WC	☑
Other	☑ *Shower*

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*Minimum 8 air changes per hour. Room to be negative relative to adjacent spaces.*
Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*4*
Other Duplex Min. Qty	*2*
	Above counter for hair dryer

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door* ☑

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
017	Counter, no base cabinet	1	Yes	CSCI

Department:	**05 - Athletics**
Minimum Area:	**25.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- 6 workstations for teachers, coaches

Critical Adjacencies

- Direct access to staff shower/WC
- Gym PDC requires direct adjacency and visual access to the Gymnasium Large and desirable to have visual access to the Gymnasium Small.

Design Features

- Space must allow for a central collaboration table
- Countertop surround over half height lockers

Additional Remarks

- Refer to diagram in Section 2.0 for PDC typologies

Occupancy

Capacity	*8*

Daylighting

☑ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(1) 1200x1200*
Tackboard	☑ *(2) 1200x1200*
Computer	☑ *Eight (8) Computer Workstation (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Desk/Counter Surface for eight (8) (OSOI)
2. Eight (8) Office Chair (OSOI)
3. Eight (8) half lockers (CSCI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Double	☑

Sink Mounting

Counter	☑

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide one duplex on vertical face of the middle locker island on the short side.
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required
-

Duplex Min. Qty *8*

- Equally spaced on the wall at counter location
- Power outlets to be counter height

Other Duplex Min. Qty

See General Power requirement above

Other

Clocks ☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 6*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 600m wide*
Other Doors *Man-door*☑

Windows

Internal Glazing *Y/N*☑
Window Covering Notes *RS- Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
001	Base Cabinet Open for Mini-Fridge	1	Yes	CSCI
	Note: Type 2- instead of tall cabinet.			
016	Counter w/ Lockers Below	1	Yes	CSCI
039	Tall Storage Cabinet w/ Lockable Doors and Whiteboard	1	Yes	CSCI
	Note: Type 1- Provide instead of Base cabinet & Upper cabinets. Total millwork width of 2400 mm.			
055	Wall Hung Upper Cabinet w/ Double Doors & Shelves	1	Yes	CSCI
	Note: Along 1 wall. Type 2- instead of tall cabinet.			

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
1059	Filing Cabinet #1	1	No	OSOI
1060	Filing Cabinet #2	4	No	OSOI
1061	Mini Fridge	1	No	OSOI

BIM ID	Item Name	Qty	To be Modeled	Responsibility
1062	Microwave	1	No	OSOI

Department:	**05 - Athletics**
Minimum Area:	**15.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Direct access to Staff PDC (office)
- No access from the main corridor

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Tile*

Equipment and Accessories

Sink Accessories

Soap Dispenser	☑
Paper Towel Dispenser	☑
Paper Towel Waste	☑

Room Accessories

Coat Hook	☑
Mirror	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Toilet Paper Dispenser-Dual (CSCI)
2. Sanitary Napkin Disposal (CSCI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Handwash	☑

Sink Mounting

Counter	☑

Fixtures

WC	☑
Other	☑ *(1) shower, (2) WC provide 1 male and 1 female*

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1*
Other Duplex Min. Qty	*2*

- Provide GFI outlets as sink

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door* ☑

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
017	Counter, no base cabinet	1	Yes	CSCI

Storage Closet Uniform/ Concession
Room No. 05.010

Department:	**05 - Athletics**
Minimum Area:	**15.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Storage of Team Uniforms, lockable, includes washer & dryer

Design Features

- Counter and opening for concession sales from corridor side, provide fully closed security grill without any penetrations, needs to be lockable from the inside of space
- Used for storing jerseys and will also act as the concessions stand during games. A security grill is required to face onto the corridor side where the counter and opening is located, not the gym side as this will cause a bottleneck where games are played. This counter must be easily located and identified from the main gym entry.

Occupancy

Capacity	*2*

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Computer	☑ *Two (2) cash register (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Fridge (OSOI)
2. One (1) Washer (stackable) (OSOI)
3. One (1) Dryer (stackable) (OSOI)

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*Exhaust from dryer and exhaust from room to remove heat and moisture.*
Minimum Temp (C)	*19*

Electrical Requirements

Power

General Power

- Provide power as per FFE and Existing Equipment list

Duplex Min. Qty *4*

- One (1) at transaction window for computer

Other Duplex Min. Qty

See General Power requirement above

Storage Closet Uniform/ Concession
Room No. 05.010

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 4*
Remarks	*Two (2) data drops at transaction window*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide - Interior Security Shutters material to have small slots or perforation for security.*
Other Doors *Man-door* ☑ *Other* ☑ *Interior Security Shutter at the window*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
005	Base Cabinet w/ Lockable Double Doors & Adjustable Shelves	1	Yes	CSCI
044	Uniform Storage (TBD)	1	Yes	CSCI

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
1091	Jersey Rack	1	No	OSOI
1095	Mobile Carts	1	No	OSOI
1096	Clothing Rack	2	No	OSOI

Department:	**05 - Athletics**
Minimum Area:	**570.00**
Ceiling Height:	**7340.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Directly adjacent to PE storage

Design Features

- Not FIBA keys use Canadian standards
- 19 m x 30 m space
- 1 Full Basketball Court (2 motorized drop hoops). The court shall require a minimum 15 m width clear between the perimeter lines, and minimum 1.5m run-offs.
- 2 modified Cross Basketball Court (4 wall mounted hoops). Modified: does not need to be official size or for competition, used for PE classes and practices.
- 4 Badminton Courts
- 1 central volleyball court parallel to the basketball court
- Mesh motorized heavy duty partition. Provide person door/access in the partition.
- From bleachers, two sets on either side of the dividers.
- Digital score board
- All sharp corners must have padding
- (4) Hand ball crease (location and size to be confirmed with users)
- Verify court line locations and colours with users
- At each basket ball key provide 1800h wall padding length of the basketball key on wall behind.
- Provide exterior glazing at minimum of 25% of exterior walls as measured from finish floor elevation to clear ceiling height. Glazing is to be provided with blackout roller shades. A minimum of 75% of glazing is to provide diffuse natural light. Non-diffuse glazing shall not introduce glare or direct beams of light on activity areas.

Additional Remarks

- Requires access afterhours

Occupancy

Capacity	*30*

Daylighting

☐ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Wood gym floor with oil-based sealant*

Ceiling Finishes

Ceiling Characteristics	*Exposed*

Wall Finishes

Wall Characteristics	*VSB standard*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(2) 1200x2400 one each divided space*
Long Throw Projector (OSOI)	☑ *(2) ceiling mounted c/w cage protection*
Other	☑ *(2) drop down motorized projection screen*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Digital score board (CSCI)
2. Sound system (CSCI)
3. Motorized partition (CSCI)
4. Two (2) Shot Clocks (CSCI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*26*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*12*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 2*
Data	☑ *CAT6 Drop Min Qty: 12*
Remarks	*Rough-ins - No. speakers will be provided as per SOR (audio to have two audio zone controls for each partitioned space)*

Lighting

Luminaire Type

LED	☑
Indirect	☑
Other	☑ *No pot lights, pendants. Natural light required*

Lighting Control

	As per VSB Electrical Standards / ASHRAE Requirements
Dimmer	☑

Room Design - Door & Window Requirements

Doorsets

Remarks - *Double doors - Minimum 915 mm (leaf) - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable No direct daylighting- diffuse*
Window Covering Notes *BRS- Blackout Roller Shade*

Department:	**05 - Athletics**
Minimum Area:	**150.00**
Ceiling Height:	**3050.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- directly adjacent to the Weight room with garage door or folding doors to open up to the Weight room for larger classes and events

Design Features

- provide approx. 6 SM out of this room area towards table and chair storage

Occupancy

Capacity	*30*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Ceiling Finishes

Ceiling Characteristics	*Exposed*

Wall Finishes

Wall Characteristics	*Painted GWB*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(2) 1200x2400 on either side of the LCD TV*
LCD Screen	☑ *(OSCI)*
Audio Input Station	☑ *(4)*
Coat Hook	☑
Mirror	☑ *One mirror wall 300mm min AFF to avoid damage. Longest perimeter wall.*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Foldable Student Tables for 30 Students (OSOI)
2. Thirty (30) Student Chairs Stackable (OSOI)
3. One (1) LCD Screen (OSOI)

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*Adequate ventilation to meet cooling requirements and exhaust to maintain room at negative pressure relative to adjacent spaces.*
Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Receptacles to be placed along perimeter walls
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 8*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door* ☑ *Other* ☑ *Operable Partition*

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N* ☑ *Type From main corridor into room*
Window Covering Notes *RS- Roller Shade*

Department:	**05 - Athletics**
Minimum Area:	**35.00**
Ceiling Height:	**3050.00**

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

Lighting

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

06
General Instruction

Last modified: **October 31 2019 12:01 AM**

Details

Typical Program Area:	**75.00**
Description:	**06- General Instruction**
Notes:	

Room Design Requirements

General Design Requirements

Activities and Functions

- Accommodate up to 30 students; individual desks, flexible furniture; open shelving along some wall perimeters

Critical Adjacencies

- Must have direct daylight and visual access to the exterior
- General instruction classrooms are not to be located in a center aisle without direct visual access to the exterior.

Design Features

- Classroom length must be between 1.25 to 1.5 times the width of the room to ensure acceptable viewing angles of projection screens and whiteboards.
- Classrooms must allow for flexibility for different desk arrangements.
- Design must ensure that there are no obstructions, such as columns within the classrooms.
- Teachers' workstation at where the short through project is
- Allow for two teaching walls and one display wall. Teaching walls require whiteboards while display walls require tack boards.
- The two teaching walls must be at 90 degrees but not directly across from each other on opposite walls.
- Doors are to be located at the same end as the teaching wall
- Unit ventilator

Additional Remarks

- All general instruction classrooms are to have similar dimensions in width, length and height and must be the same area.

Occupancy

Capacity	*30*

Daylighting

☑ *Direct*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Ceiling Finishes

Ceiling Characteristics	*ACT*

Wall Finishes

Wall Characteristics	*Painted GWB*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(2) 1200x2400 sliding, (1) 1200 x 2400 fixed*
Tackboard	☑ *(1) 1200x2400*
Short Throw Projector (OSOI)	☑
Computer	☑ *One (1) Computer Workstation Teacher (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Thirty (30) Student Chair (OSOI)
2. Thirty (30) Student Desk (OSOI)
3. One (1) Office Chair (OSOI)
4. One (1) Teacher Desk (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*
Remarks	*Unit ventilator in room*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 6*

Lighting

Luminaire Type

LED	☑

Lighting Control

	As per VSB Electrical Standards / ASHRAE Requirements
Multi-Level	☑ *One for projector zone, one for the rest of the classroom*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N* ☑ *Type Adjacent to door, full height sidelight 1.5 m wide*
Window Covering *RS - Roller Shade*

Millwork Schedule

Item No.	Item Name	Qty	To be Modeled	Responsibility
06.4000.001	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
	Note: with countertop, to be 50% of exterior wall opposite entry, exclusive of unit ventilator and 50% of corridor wall exclusive of door assembly, side light and item 040 Tall Storage Cabinet w/ Lockable Double Doors and Shelves. If not integrated with corridor lockers, provide countertop.			
06.4000.003	Base Cabinet w/ Lockable Double Doors & Adjustable Shelves	1	Yes	CSCI
	Note: with countertop, to be 50% of exterior wall opposite entry, exclusive of unit ventilator and 50% of corridor wall exclusive of door assembly, side light and item 040 Tall Storage Cabinet w/ Lockable Double Doors and Shelves. If not integrated with corridor lockers, provide countertop. Lockable cabinets to be placed closer to teaching wall.			
06.4000.0415	Tall Storage Cabinet w/ Lockable Double Doors and Shelves	1	Yes	CSCI
	Note: On sidewall adjacent to corridor, for teacher storage			

Existing Equipment

Item No.	Item Name	Qty	To be Modeled	Responsibility
00.0557	Metal Cabinet	1	No	OSOI
00.0559	Television - ELL	1	No	OSOI
00.0560	Mounted Map Holder	1	No	OSOI
00.0579	Filing Cabinet #4	1	No	OSOI
00.0584	Rolled Map	2	No	OSOI
00.0585	Filing Cabinet #5	1	No	OSOI
00.0599	Filing Cabinet #6	2	No	OSOI
00.0606	Filing Cabinet #7	1	No	OSOI
00.0617	Filing Cabinet #8	1	No	OSOI
00.0618	Filing Cabinet #9	8	No	OSOI
00.0658	Filing Cabinet #2	4	No	OSOI
00.0680	Filing Cabinet #4	7	No	OSOI
00.0690	Filing Cabinet #5	1	No	OSOI
00.0757	Cabinet #2	1	No	OSOI
00.0771	Filing Cabinet #1	5	No	OSOI
00.0775	Filing Cabinet #2	2	No	OSOI
00.0782	Cabinet #1	1	No	OSOI
00.0788	Filing Cabinet #3	1	No	OSOI
00.0870	Filing Cabinet #1	6	No	OSOI
00.0873	Filing Cabinet #2	10	No	OSOI
00.0897	Book Shelf with Glass Doors #1	1	No	OSOI
00.0898	Book Shelf with Glass Doors #2	1	No	OSOI
00.0900	Filing Cabinet #3	5	No	OSOI
00.0901	Cabinet #2	2	No	OSOI

Templated Rooms:

Room Function No.	Room No.	Room Name	RDS Status	Program Area
06.001		Classroom, 1	From 06.001 - 06.037	75.00
06.002		Classroom, 2	From 06.001 - 06.037	75.00
06.003		Classroom, 3	From 06.001 - 06.037	75.00
06.004		Classroom, 4	From 06.001 - 06.037	75.00
06.005		Classroom, 5	From 06.001 - 06.037	75.00
06.006		Classroom, 6	From 06.001 - 06.037	75.00
06.007		Classroom, 7	From 06.001 - 06.037	75.00
06.008		Classroom, 8	From 06.001 - 06.037	75.00
06.009		Classroom, 9	From 06.001 - 06.037	75.00
06.010		Classroom, 10	From 06.001 - 06.037	75.00
06.011		Classroom, 11	From 06.001 - 06.037	75.00
06.012		Classroom, 12	From 06.001 - 06.037	75.00
06.013		Classroom, 13	From 06.001 - 06.037	75.00

Templated Rooms:

Room Function No.	Room No.	Room Name	RDS Status	Program Area
06.014		Classroom, 14	From 06.001 - 06.037	75.00
06.015		Classroom, 15	From 06.001 - 06.037	75.00
06.016		Classroom, 16	From 06.001 - 06.037	75.00
06.017		Classroom, 17	From 06.001 - 06.037	75.00
06.018		Classroom, 18	From 06.001 - 06.037	75.00
06.019		Classroom, 19	From 06.001 - 06.037	75.00
06.020		Classroom, 20	From 06.001 - 06.037	75.00
06.021		Classroom, 21	From 06.001 - 06.037	75.00
06.022		Classroom, 22	From 06.001 - 06.037	75.00
06.023		Classroom, 23	From 06.001 - 06.037	75.00
06.024		Classroom, 24	From 06.001 - 06.037	75.00
06.025		Classroom, 25	From 06.001 - 06.037	75.00
06.026		Classroom, 26	From 06.001 - 06.037	75.00
06.027		Classroom, 27	From 06.001 - 06.037	75.00
06.028		Classroom, 28	From 06.001 - 06.037	75.00
06.029		Classroom, 29	From 06.001 - 06.037	75.00
06.030		Classroom, 30	From 06.001 - 06.037	75.00
06.031		Classroom, 31	From 06.001 - 06.037	75.00
06.032		Classroom, 32	From 06.001 - 06.037	75.00
06.033		Classroom, 33	From 06.001 - 06.037	75.00
06.034		Classroom, 34	From 06.001 - 06.037	75.00
06.035		Classroom, 35	From 06.001 - 06.037	75.00
06.036		Classroom, 36	From 06.001 - 06.037	75.00
06.037		Classroom, 37	From 06.001 - 06.037	75.00

Department:	**06 - General Instruction**
Minimum Area:	**69.00**
Ceiling Height:	**3050.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Direct access to Graphic Arts and MAC lab as students share these resources

Design Features

- Laydown area in middle with flexible working tables and computer on the sides
- Accommodate 10 computers located at perimeter of room
- Teacher work station

Additional Remarks

- This space may be smaller in area (to a minimum of 60 SM) with the remaining area divided back towards the 37 general instruction areas

Occupancy

Capacity	*30*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(1) 1200x1200*
Tackboard	☑ *(2)1200x1200*
Short Throw Projector (OSOI)	☑
Computer	☑ *Ten (10) (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Fridge (OSOI)
2. One (1) Microwave (OSOI)
3. One (1) Kettle (OSOI)
4. Six (6) Table mobile for computer (OSOI)
5. Thirty (30) Student Chairs (OSOI)
6. One (1) Office Chair (OSOI)
7. One (1) Teacher Desk (OSOI)
8. Ten (10) Computer Workstations (OSOI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑
Notes	☑ *The sink to be located on the door wall.*

Sink Types

Double	☑ *Qty: 1*

Sink Mounting

Counter	☑

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*8*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 20*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N*☑
Window Covering *RS - Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
005	Base Cabinet w/ Lockable Double Doors & Adjustable Shelves	1	Yes	CSCI
	Note: With countertop. Furniture system alternate allowed.			
052	Wall Hung Upper Cabinet open w/ Shelves	1	Yes	CSCI
	Note: With lighting at underside of cabinets. Furniture system alternate allowed.			

Last modified: **November 07 2019 03:58 PM**

Details

Typical Program Area: **15.00**
Description: **06- General Instruction**
Notes:

Room Design Requirements

General Design Requirements

Activities and Functions

- Prep, collaboration, small meeting and storage space

Additional Remarks

- Refer to diagram in Section 2.0 for PDC typologies

Occupancy

Capacity	*5*

Daylighting

☑ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Whiteboard	☑
Tackboard	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Microwave (OSOI) (Two existing microwaves available)
2. One (1) Kettle (OSOI)
3. One (1) Collaboration table (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Above counter power for kettle and microwave
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*7*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 6*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 600mm wide*
Other Doors *Man-door* ☑

Windows

Internal Glazing *Y/N* ☑
Window Covering *RS - Roller Shade*

Millwork Schedule

Item No.	Item Name	Qty	To be Modeled	Responsibility
06.4000.001	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
	Note: With countertop, Type 1- provided instead of tall cabinet.			
06.4000.0418	Wall Hung Upper Cabinet open w/ Shelves	1	Yes	CSCI
	Note: 50% of total, Type 1- provided instead of tall cabinet.			
06.4000.0451	Tall Storage Cabinet w/ Lockable Doors and Whiteboard	1	Yes	CSCI
	Note: Type 2- provided instead of lowers & uppers. Total millwork width: 1800 mm			
06.4000.139	Wall Hung Upper Cabinet Lockable w/ Double Doors & Shelves	1	Yes	CSCI
	Note: 50% of total, Type 1- provided instead of tall cabinet.			

Existing Equipment

Item No.	Item Name	Qty	To be Modeled	Responsibility
00.0682	Printer	1	No	OSOI
00.0687	Microwave	1	No	OSOI
00.0708	Printer #1	1	No	OSOI
00.0711	Filing Cabinet #1	3	No	OSOI
00.0712	Mini Fridge	1	No	OSOI
00.0714	Filing Cabinet #2	1	No	OSOI
00.0719	Filing Cabinet #2	6	No	OSOI
00.0720	Filing Cabinet #3	3	No	OSOI
00.0730	Metal Cabinet #2	4	No	OSOI
00.0774	Microwave	1	No	OSOI

Templated Rooms:

Room Function No.	Room No.	Room Name	RDS Status	Program Area
06.039		PDC - English	From 06.039, 06.043, 06.045, 06.047	15.00
06.043		PDC - Math	From 06.039, 06.043, 06.045, 06.047	15.00
06.045		PDC - Social Studies	From 06.039, 06.043, 06.045, 06.047	15.00
06.047		PDC - Languages	From 06.039, 06.043, 06.045, 06.047	15.00

Department:	**06 - General Instruction**
Minimum Area:	**8.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Prep, collaboration, small meeting and storage space

Additional Remarks

- Refer to diagram in Section 2.0 for PDC typologies

Occupancy

Capacity	*3*

Daylighting

☑ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Whiteboard	☑
Tackboard	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Kettle (OSOI)
2. Collaboration table (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Above counter power for kettle and microwave
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*3*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 4*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☐ ☐ *Operable*
Internal Glazing *Y/N*☑
Window Covering *RS - Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
003	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
	Note: With countertop, Type 1- provided instead of tall cabinet			
039	Tall Storage Cabinet w/ Lockable Doors and Whiteboard	1	Yes	CSCI
	Note: Type 2- provided instead of lowers & uppers. Total millwork width: 1200 mm			
052	Wall Hung Upper Cabinet open w/ Shelves	1	Yes	CSCI
	Note: 50% of total, Type 1- provided instead of tall cabinet			
058	Wall Hung Upper Cabinet Lockable w/ Double Doors & Shelves	1	Yes	CSCI
	Note: 50% of total, Type 1- provided instead of tall cabinet			

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0271	Filing Cabinet #1	1	No	OSOI
0277	Filing Cabinet #2	3	No	OSOI
0282	Filing Cabinet #3	2	No	OSOI
0327	Fridge	1	No	OSOI
0328	Microwave	1	No	OSOI
0329	Printer	1	No	OSOI

07
Science

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Details

Typical Program Area:	**133.50**
Description:	**07- Science**
Notes:	

Room Design Requirements

General Design Requirements

Activities and Functions

- The lab zone will have 30 workstations (24 in millwork bench islands, with moveable desks added, and 6 located at the side.
- Flexible layout due to moveable tables and minimal fixed benches in center of room.
- 31 seats (1 for teacher)
- Refer to Typology Diagram 3: Chemistry, Biology, Physics & Universal Lab Design.

Critical Adjacencies

- All science classrooms must have direct daylight and visual access to the exterior.
- Science classrooms are not to be located in a center aisle without direct visual access to the exterior.
- Direct access to Chemistry storage and prep room

Design Features

- Provide eye hooks that can hold up to 10 lbs evenly spread out on the ceiling approximately 1 meter apart in a grid pattern
- Entrance at same end as teaching wall
- 1 duplex electrical and a gas outlet for each pair of students to be located on top of fixed lab benches (between sinks) and at 3 stations on the exterior side of room (Refer to Typology Diagram)
- Moveable platform under the teacher's desk

Additional Remarks

- All moveable tables, fixed tables, and counters to be at the same height, except for ADA compliant work surfaces.

Occupancy

Capacity	*31*

Daylighting

☑ *Direct*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient, chemical resistant*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(4) 1200 x 2400*
Tackboard	☑ *(2) 1200 x 1200*
Short Throw Projector (OSOI)	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Fume hood (CSCI)
2. Thirty-one (31) chairs (high chairs for counter height) (OSOI)
3. Six (6) stools for fixed lab bench (OSOI)
4. Two (2) ADA compliant stools (OSOI)
5. One (1) Moveable ADA compliant desk (OSOI)
6. One (1) Teacher Desk (OSOI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑ *Backflow prevention to meet plumbing code requirements for laboratory faucets*
Notes	☑ *(1) trough sink 1830 mm x 457 mm, 2 kitchen type mixer faucets, min 900 mm space on either side to dry glassware (6) narrow sinks 762 mm x 200 mm, 2 laboratory faucets, one at each end (1) single sink with 2 laboratory faucets (1) ADA compliant sink with 1 laboratory faucet*

Sink Types

Double	☑
Other	☑

Sink Mounting

Counter	☑

Fixtures

Floor Drain	☑
Eyewash	☑
Emergency Shower	☑
Corrosion Resistant Fittings	☑ *Qty: From laboratory sinks*
Notes	*Emergency shower and eyewash as shown in diagram*

Gases

Natural Gas	☑ *Qty: 30 outlets for students, 2 outlets at teachers desk*

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*Exhaust from fume hoods. General exhaust to maintain room at negative pressure relative to adjacent areas with fume hood off. Provide local on/off switch for fume hood.*
Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Lab zone - 1 electrical duplex receptacle to be shared amongst 2 students for class of 30 students
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 12*

Lighting

Luminaire Type

LED	☑

Lighting Control

	As per VSB Electrical Standards / ASHRAE Requirements
Multi-Level	☑ *3 lighting zone - white board, teaching space, bench space*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N* ☑ *Type Glazing to interior spaces must be located by the door as a full height sidelight and be 1.5 m wide*
Window Covering *RS - Roller Shade*

Millwork Schedule

Item No.	Item Name	Qty	To be Modeled	Responsibility
06.4000.003	Base Cabinet w/ Lockable Double Doors & Adjustable Shelves	1	Yes	CSCI
	Note: with countertop, acid resistant, all lockable except where sink in counter above, run length of exterior wall			
06.4000.0416	Lab Counter (TBD)	1	Yes	CSCI
06.4000.0417	Wall Hung Upper Cabinet w/ Double Glass Doors & Shelves	1	Yes	CSCI
06.4000.0419	Base Cabinet w/ Double Doors & Adjustable Shelves	1	Yes	CSCI
	Note: with countertop, acid resistant, only at sink locations			
06.4000.204	Tall Storage Cabinet w/ Lockable Drawers and Whiteboard	1	Yes	CSCI

Existing Equipment

Item No.	Item Name	Qty	To be Modeled	Responsibility
00.1056	Filing Cabinet #1	7	No	OSOI
00.1060	Student Table #1	19	No	OSOI
00.1063	Student Table #2	19	No	OSOI

Templated Rooms:

Room Function No.	Room No.	Room Name	RDS Status	Program Area
07.001		Chemistry Lab, 1	From 07.001 - 07.002	133.50
07.002		Chemistry Lab, 2	From 07.001 - 07.002	133.50

Storage and Prep-Chemistry
Room No. 07.003

Department: **07 - Science**

Minimum Area: **20.00** *Ceiling Height:* **3050.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Storage and prep room

Critical Adjacencies

- Direct access Chemistry Labs

Design Features

- Requires direct access to the two chemistry labs and also requires access by the universal labs in the grouping without having to go through the chemistry lab

Occupancy

Capacity	*1*

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Ceiling Finishes

Ceiling Characteristics	*ACT*

Wall Finishes

Wall Characteristics	*Painted GWB*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Ice maker (OSOI)
2. One (1) Fridge half height (OSOI)
3. One (1) Acid Cabinet (OSOI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑ *Backflow prevention to meet plumbing code requirements.*
Notes	☑ *Plumbing connection for distillation apparatus that will be connected to the plumbing and mounted on the counter.*

Sink Types

Double	☑
Other	☑ *Double sink requires distillation apparatus that is connected to plumbing and mounted on the counter*

Sink Mounting

Counter	☑

Fixtures

Corrosion Resistant Fittings	☑

Gases

Natural Gas	☑ *Qty: 2 outlets*

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*General lab exhaust to maintain room at negative pressure relative to adjacent areas.*
Minimum Temp (C)	*21*
Maximum Temp (C)	*25*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty *5*

- 4 Above counter
- 1 for house keeping

Other Duplex Min. Qty

See General Power requirement above

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors*
Other Doors *Man-door* ☑

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
003	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
	Note: 760 mm deep. 500 mm long with drawers, remainder open shelving. Acid resistant countertop.			
007	Base Cabinet w/ Drawers	1	Yes	CSCI
	Note: With countertop, Allow for wall space for solvent cabinet, acid cabinet & fridge. 500 mm long with drawers, remainder open shelving. Acid resistant countertop.			
035	Tall Open Wall Shelving w/ Lip	1	Yes	CSCI
054	Wall Hung Upper Cabinet Open, 400 depth	1	Yes	CSCI

Storage and Prep-Chemistry
Room No. 07.003

BIM ID	Item Name	Qty	To be Modeled	Responsibility
Note: Allow for wall space for solvent cabinet, acid cabinet & fridge.				

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0799	Fridge	1	No	OSOI
0804	Flammables Cabinet	1	No	OSOI
0807	Metal Cabinet	2	No	OSOI

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Details

Typical Program Area:	**134.10**
Description:	**07- Science**
Notes:	

Room Design Requirements

General Design Requirements

Activities and Functions

- The lab zone will have 30 workstations (24 in millwork bench islands, with moveable desks added, and 6 located at the side.
- Flexible layout due to moveable tables and minimal fixed benches in center of room.
- 31 seats (1 for teacher)
- Refer to Typology Diagram 3: Chemistry, Biology, Physics & Universal Lab Design.

Critical Adjacencies

- All science classrooms must have direct daylight and visual access to the exterior.
- Science classrooms are not to be located in a center aisle without direct visual access to the exterior.
- Direct access to Chemistry storage and prep room

Design Features

- Provide eye hooks that can hold up to 10 lbs evenly spread out on the ceiling approximately 1 meter apart in a grid pattern
- Entrance at same end as teaching wall
- 1 duplex electrical and a gas outlet for each pair of students on top of fixed lab benches (between sinks) and at 3 stations on the exterior side of room (Refer to Typology Diagram)
- Moveable platform under the teacher's desk

Additional Remarks

- All moveable tables, fixed tables, and counters to be at the same height, except for ADA compliant work surfaces.

Occupancy

Capacity	*31*

Daylighting

☑ *Direct*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient, chemical resistant*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(4) 1200 x 2400*
Tackboard	☑ *(2) 1200 x 1200*
Short Throw Projector (OSOI)	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Fume hood (CSCI)
2. Thirty-one (31) chairs (OSOI)
3. Sixteen (16) moveable student tables (OSOI) (Eighty-four existing student tables available)
4. Six (6) stools for fixed lab bench (OSOI)
5. Two (2) ADA compliant stools (OSOI)
6. One (1) Moveable ADA compliant desk (OSOI)
7. One (1) Teacher Desk (OSOI)
8. One (1) Office Chair (OSOI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑ *Backflow prevention to meet plumbing code requirements for laboratory faucets*
Notes	☑ *(1) trough sink 1830 mm x 457 mm, 2 kitchen type faucets, min 900 mm space on either side to dry glassware (6) narrow sinks 762 mm x 200 mm, 2 laboratory faucets, one at each end (1) double sink with 2 laboratory faucets (1) ADA compliant sink with 1 laboratory faucet*

Sink Types

Double	☑
Other	☑

Sink Mounting

Counter	☑

Fixtures

Floor Drain	☑
Eyewash	☑
Emergency Shower	☑
Corrosion Resistant Fittings	☑ *Qty: From laboratory sinks*
Notes	*Emergency shower and eyewash as shown in diagram*

Gases

Natural Gas	☑ *Qty: 30 outlets for students, 2 outlets for teachers desk*

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*Exhaust from fume hoods. General exhaust to maintain room at negative pressure relative to adjacent areas with fume hood off. Provide local on/off switch for fume hood.*
Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Lab zone - 1 electrical duplex receptacle to be shared between two (2) students for class of 30 students
- Demo desk - 1 electrical duplex
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 8*

Lighting

Luminaire Type

LED	☑

Lighting Control

	As per VSB Electrical Standards / ASHRAE Requirements
Multi-Level	☑ *3 lighting zone - white board, teaching space, bench space*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N* ☑ *Type Glazing to interior spaces must be located by the door as a full height sidelight and be 3 m wide*
Window Covering *RS - Roller Shade*

Millwork Schedule

Item No.	Item Name	Qty	To be Modeled	Responsibility
06.4000.003	Base Cabinet w/ Lockable Double Doors & Adjustable Shelves	1	Yes	CSCI
	Note: with countertop, acid resistant, all lockable except where sink in counter above, run length of exterior wall			
06.4000.0416	Lab Counter (TBD)	1	Yes	CSCI
06.4000.0417	Wall Hung Upper Cabinet w/ Double Glass Doors & Shelves	1	Yes	CSCI
06.4000.0419	Base Cabinet w/ Double Doors & Adjustable Shelves	1	Yes	CSCI
	Note: with countertop, acid resistant, only at sink locations			
06.4000.204	Tall Storage Cabinet w/ Lockable Drawers and Whiteboard	1	Yes	CSCI

Existing Equipment

Item No.	Item Name	Qty	To be Modeled	Responsibility
00.0816	Study Carrel	8	No	OSOI
00.1082	Student Table #3	69	No	OSOI
00.1089	Student Table #4	15	No	OSOI

Templated Rooms:

Room Function No.	Room No.	Room Name	RDS Status	Program Area
07.004		Universal Science Lab, 7 (Biology)	From 07.004, 07.008 - 07.013	133.50
07.008		Universal Science Lab, 1	From 07.004, 07.008 - 07.013	133.50

Templated Rooms:

Room Function No.	Room No.	Room Name	RDS Status	Program Area
07.009		Universal Science Lab, 2	From 07.004, 07.008 - 07.013	133.50
07.010		Universal Science Lab, 3	From 07.004, 07.008 - 07.013	133.50
07.011		Universal Science Lab, 4	From 07.004, 07.008 - 07.013	133.50
07.012		Universal Science Lab, 5	From 07.004, 07.008 - 07.013	133.50
07.013		Universal Science Lab, 6	From 07.004, 07.008 - 07.013	133.50

Department: **07 - Science**

Minimum Area: **20.00** *Ceiling Height:* **3050.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Direct access to Biology lab
- Direct access to Physics Lab

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*25*

Electrical Requirements

Power

Duplex Min. Qty	*1*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*

Other Doors *Man-door*☑

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
035	Tall Open Wall Shelving w/ Lip	1	Yes	CSCI

Note: provide space for fridge

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0788	Mini Fridge	1	No	OSOI

Department:	**07 - Science**
Minimum Area:	**133.50**
Ceiling Height:	**3050.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Refer to typology Diagram 3A: Physics Lab

Critical Adjacencies

- All science classrooms must have direct daylight and visual access to the exterior.
- Science classrooms are not to be located in a center aisle without direct visual access to the exterior.
- Direct access to storage- physics

Design Features

- Structural metal bar: used to suspend heavy items such as bowling balls, pulley systems, miniature zip lines, etc. The bar should be able to withstand sudden jerks, such as those created by students jumping up and grabbing the bar (hence the 500 lbs load). Example of construction: 3" diameter tube, hangs off 3 vertical steel straps that are attached to the structural members of the roof, and there are steel cables inside the false ceiling to stop the bar from swinging laterally. The steel tube has end caps. The bar runs about 3/4 the depth of the room off to one side of the lab. The bar could also be off to the side of the room affixed to a load-bearing wall, it should be at least 3/4 of the width of the room. There should be enough space above the bar (1 ft) so ropes can be tied around it. Electrical outlets should be located on both ends of the bar and on the ceiling.
- Teacher desk with sink and gas
- 1 ADA accessible student workstation
- Access to lab from the teaching wall side of the room

Occupancy

Capacity	*31*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient - Movable rubber mats will be used, no special flooring required*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(2) 1200x2400*
Tackboard	☑ *(2) 1200x1200 Tack board, either side of the white boards*
Short Throw Projector (OSOI)	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Fume hood (CSCI)
2. Thirty-one (31) chairs (high chairs for counter height) (OSOI)
3. Sixteen (16) moveable tables 1525w x 610x 915h (OSOI)
4. Six (6) stools for fixed lab bench (OSOI)
5. Two (2) ADA compliant stools (OSOI)
6. One (1) Moveable ADA compliant desk (OSOI)
7. One (1) Teacher Desk (OSOI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑
Notes	☑ *(1) sink at demo station (1) deep sink for student use*

Fixtures

Eyewash	☑
Emergency Shower	☑
Notes	*Emergency shower and eyewash is to be provided*

Sink Types

Double	☑
Other	☑

Gases

Natural Gas	☑ *Qty: 2 outlets at teachers desk*

Sink Mounting

Counter	☑

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Two (2)ceiling electrical outlets on opposite ends of the structural bar (outlets will not to be retractable)
- One (1) above structural bar
- Provide power as per FFE and Existing Equipment list

Duplex Min. Qty *20*

- located on wall

Other Duplex Min. Qty

See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 12*

Lighting

Luminaire Type

LED	☑

Lighting Control

	As per VSB Electrical Standards / ASHRAE Requirements
Multi-Level	☑ *3 zones - teaching zone, teaching zone, lab zone*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N* ☑ *Type Glazing to interior spaces must be located by the door as a full height sidelight and be 3 M wide.*
Window Covering *RS - Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
003	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
Note: TBC by science staff				
005	Base Cabinet w/ Lockable Double Doors & Adjustable Shelves	1	Yes	CSCI
Note: TBC by science staff				
023	Lab Counter-Teacher Demo Station	1	Yes	CSCI
056	Wall Hung Upper Cabinet w/ Double Glass Doors & Shelves	1	Yes	CSCI

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0794	Filing Cabinet #2	5	No	OSOI

Department:	**07 - Science**
Minimum Area:	**15.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Refer to General PDC

Additional Remarks

- Refer to diagram in Section 2.0 for PDC typologies

Occupancy

Capacity	*8*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Whiteboard	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Microwave (OSOI)
2. One (1) Kettle (OSOI)
3. Tables (6-8 people) (OSOI)
4. Office Chairs (6-8 people) (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Below counter outlets for microwave, kettle, and fridge
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*7*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 6*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 600mm wide*
Other Doors *Man-door* ☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N* ☑
Window Covering *RS - Roller Shade*
Window Covering Notes *RS - Roller Shade (exterior and internal glazing)*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
003	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
	Note: With counter, Type-1, provided instead of tall cabinet			
021	General Work Surface	1	Yes	CSCI
039	Tall Storage Cabinet w/ Lockable Doors and Whiteboard	1	Yes	CSCI
	Note: Type-2, provided instead of upper cabinets & Lower Cabinets. Total millwork width: 1800 mm			
052	Wall Hung Upper Cabinet open w/ Shelves	1	Yes	CSCI
	Note: 50% uppers open, Type-1, provided instead of tall cabinet			
058	Wall Hung Upper Cabinet Lockable w/ Double Doors & Shelves	1	Yes	CSCI
	Note: 50% uppers lockable, Type-1, provided instead of tall cabinet			

08

Applied Skills–Industrial Education

Department:	**08 - Applied Skills - Industrial Education**
Minimum Area:	**225.00**
Ceiling Height:	**6000.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Wood work Capable Shop

Critical Adjacencies

- Located on ground level
- Direct access to storage

Design Features

- Demonstration area for teacher
- Outdoor area for forge work and heavy grinding
- Provide access to outdoor covered chain-link enclosure storage through sectional door
- The workshop ceiling to be 6m high min
- Provide wall surface with plywood backing for hanging tools
- 8 workbenches

Occupancy

Capacity	*31*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*- Noise and vibration generated by equipment and activities carried in the workshops shall not impact adversely the adjacent spaces Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Epoxy coated*

Ceiling Finishes

Ceiling Characteristics	*Exposed 6m high minimum*

Wall Finishes

Wall Characteristics	*- Provide wall surface with plywood backing for hanging tools (no equipment to sit in front of this area, easy access to students) - All walls to have 2.75m high wall protection -Wall above 2.75m are to be treated for acoustic attenuation.*

Wall Protection

Types	*Wall protection to 2.75 m high*

Equipment and Accessories

Sink Accessories

Soap Dispenser	☑
Paper Towel Dispenser	☑

Room Accessories

Whiteboard	☑ *(2) 1200x2400*
Tackboard	☑ *(2) 1200x2400*
Short Throw Projector (OSOI)	☑
Coat Hook	☑ *To hang aprons*
Mirror	☑ *Above trough stainless steel sink*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Power Tool/Equip (OSOI) (as per Existing Equipment List)
2. Thirty (30) Stools (OSOI)
3. Provide cantilever industrial scale brackets for storing wood, pipes (CSCI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Other	☑ *Trough stainless steel sink with multiple faucets, mirror above*

Fixtures

Eyewash	☑ *Qty: Located at sink*

Gases

Compressed Air	☑ *Qty: 8*
Notes	☑ *- Provide compressed air connections to equipment requiring gas/air in the equipment list - Provide for flexible air connections for equipment in equipment list requiring air - Provide overhead compressed air drop such that it can serve multiple equipment for cleaning equipment. - compressed air along the wall on counter/ workbench to be piped with multiples nozzle connection (quantity and location to be confirmed with user) - Equipment requiring compressed air connection to have dedicated connection*

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*- Dust extractor (prescribed system no alternate allowed) to be have separate power control. - All equipment requiring dust collection to be connected to dust extraction system - Provide floor sweep to collect dust off floor*
Minimum Temp (C)	*21*
Maximum Temp (C)	*25*

Electrical Requirements

Power

General Power

- All equipment requiring dust collection can not operate until the dust extraction system is operating for that equipment
- Workshop power controls system to be separate from dust extractor
- Provide two (2) Emergency master shut down override button location to be confirmed with user/Owner
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty: *6*

Other Duplex Min. Qty: See General Power requirement above

Retractable Overhead Duplex Min. Qty (industrial grade): *8*

- Eight (8) retractable cord reels (1per bench)

Other

Clocks: ☑

Communication Requirements

Communication Systems

Telephone: ☑ *CAT6 Drop Min Qty: 1*

Data: ☑ *CAT6 Drop Min Qty: 12*

Lighting

Luminaire Type

LED: ☑ *guard wire cage for luminaires*

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Double door - Minimum 915 mm (leaf) - Wood doors - Sidelight 1.5m wide - Overhead exterior door to exterior to have a vision panels as well*

Other Doors *Man-door* ☑ *Other* ☑ *Overhead exterior door*

Windows

Exterior Window Required ☑ ☑ *Operable*

Internal Glazing *Y/N* ☑ *Type To exterior corridors*

Window Covering *RS - Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
037	Tall Storage Cabinet w/ 4 Doors and Adjustable Shelving & Door Shelving	2	Yes	CSCI
Note: 1220 wide, 2 in room				
043	Tall Storage Cabinet w/ 4 Doors and Adjustable Shelving	6	Yes	CSCI
Note: 1220 wide, 6 in room				
045	Vertical Storage for sheet material	1	Yes	CSCI
059	Workbench	1	Yes	CSCI

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0757	Cabinet #4	2	No	OSOI
0758	Cabinet #5	1	No	OSOI
0759	Cabinet #6	1	No	OSOI
0760	Cabinet #7	1	No	OSOI

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0761	Tool Cabinet	1	No	OSOI
0762	Wood Lathe	4	No	OSOI
0763	Bandsaw	1	No	OSOI
0764	Drill Press #1	2	No	OSOI
0765	Drill Press #2	1	No	OSOI
0766	Bandsaw	1	No	OSOI
0767	Sander #1	1	No	OSOI
0768	Sander #2	1	No	OSOI
0769	Router and Table #1	1	No	OSOI
0770	Router and Table #2	1	No	OSOI
0771	Miter Saw #1	1	No	OSOI
0772	Panel Saw	1	No	OSOI
0773	Table Saw	1	No	OSOI
0774	Outfeed Table #1	1	No	OSOI
0775	Miter Saw #2	1	No	OSOI
0776	Outfeed Table #2	1	No	OSOI
0777	Planar	1	No	OSOI
0778	Jointer	1	No	OSOI
0779	Scroll Saw	1	No	OSOI
0780	Glue Table	1	No	OSOI

Department:	**08 - Applied Skills - Industrial Education**
Minimum Area:	**121.00**
Ceiling Height:	**6000.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Clean space for teaching, design studio space

Critical Adjacencies

- Accessibility from the exterior for loading/unloading robotics

Design Features

- Demonstration area for teacher
- The room layout proportion to be close to a square, not rectangular

Occupancy

Capacity	*31*

Daylighting

☑ *Direct* ☑ *Indirect*

Acoustics

Acoustic Requirements

Comments	*-Acoustic separation from shops. Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Epoxy coated*

Ceiling Finishes

Ceiling Characteristics	*Exposed*

Wall Finishes

Wall Characteristics	*Painted GWB*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(2) 1200x2400*
Tackboard	☑ *(1) 1200x2400*
Short Throw Projector (OSOI)	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Thirty (30) Foldable chairs and stackable chair to make floor space for mechanical production (OSOI)
2. Provide 2.5mx2.5m surface for robotics playfield with 1.2m working clearance all around (OSOI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Double	☑

Fixtures

Eyewash	☑ *Qty: Located at sink*

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*Provide two soldering exhaust arms (location to be confirmed) with local on/off switches and BMS control. Provide exhaust for 3D printer (location to be confirmed) with local on/off switch and BMS control.*
Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide master power shutdown override button
- Provide power for Light table
- Provide additional power outlets that are retractable in accordance with machinery on the equipment schedule
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Power requirement above
Retractable Overhead Duplex Min. Qty (industrial grade)	*12*

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 12*

Lighting

Luminaire Type

LED	☑ *guard wire cage for luminaires*

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Double door - Minimum 915 mm (leaf) - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door* ☑ *Other* ☑ *Double door to exterior*

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N* ☑ *Type View into shops*
Window Covering *RS - Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
015	Computer Work Surface	1	Yes	CSCI
027	Mobile Shelving-Open w/ Adjustable Shelving	4	Yes	CSCI

Note: 4 total in room

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0740	Gaming Table	2	No	OSOI
0741	Small Gaming Table	12	No	OSOI
0742	Drill Press	3	No	OSOI

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0743	Grinder	2	No	OSOI
0744	3D Printer	1	No	OSOI
0745	Mobile Tool Storage #1	1	No	OSOI
0746	Mobile Shelving	3	No	OSOI
0747	Television on Stand	1	No	OSOI
0748	Table #7	1	No	OSOI
0749	Printer	3	No	OSOI
0750	Table #8	1	No	OSOI
0751	Table #9	1	No	OSOI

Department:	**08 - Applied Skills - Industrial Education**
Minimum Area:	**30.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Storage for material, power tools, and supplies

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Epoxy coated*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Wall hung heavy duty metal shelving from floor to ceiling (OSOI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Other	☑ *Single steel sink*

Sink Mounting

Counter	☑

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*Background exhaust ventilation to remove moisture and any fumes from wood.*
Minimum Temp (C)	*19*

Electrical Requirements

Power

Duplex Min. Qty	*5*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door* ☑

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
029	Tall Cabinet w/ Work Counter	1	Yes	CSCI

Drafting Room/Maker Space
Room No. 08.004

Department:	**08 - Applied Skills - Industrial Education**
Minimum Area:	**120.00**
Ceiling Height:	**6000.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Makers space: enclosed space for laser cutter, (3) 3D printer, 1 vinyl cutter

Design Features

- Teacher demonstration desk to be in the middle of the classroom, refer to typology sketch in Functional Program
- All equipment to have working clearance around
- Window between equipment enclosure and the drafting room

Occupancy

Capacity	*31*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings - Maker space equipment room to have STC rating between the drafting room.*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient flooring*

Ceiling Finishes

Ceiling Characteristics	*6m high, Exposed*

Wall Finishes

Wall Characteristics	*Painted GWB*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(1) 1200x2400*
Tackboard	☑ *(1) 1200x2400*
Short Throw Projector (OSOI)	☑
Computer	☑ *Thirty-one (31) (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Laser cutter (OSOI)
2. Three (3) 3D printer (OSOI)
3. One (1) Vinyl cutter (OSOI)
4. Light table (OSOI)
5. Two (2) Printer (B&W and Colour) (OSOI)
6. Additional foldable table for 31 computers (OSOI)
7. Thirty-one (31) Computer Workstations (OSOI)

Drafting Room/Maker Space
Room No. 08.004

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Fixtures

Eyewash	☑ *Qty: Located at sink.*

Sink Types

Other	☑ *Trough sink*

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*Provide ventilation for equipment in the dedicated equipment enclosure/room*
Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Equipment requirement above
Retractable Overhead Duplex Min. Qty (industrial grade)	*6*

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 47*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Double door - Minimum 915 mm (leaf) - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable Visual connection to exterior*
Internal Glazing *Y/N* ☑ *Type Visual access to corridors*
Window Covering *RS - Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
015	Computer Work Surface	1	Yes	CSCI
033	Tall Open Wall Shelving	1	Yes	CSCI

Note: Along one wall 1200 wide

Department:	**08 - Applied Skills - Industrial Education**
Minimum Area:	**20.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Storage for material, power tools, and supplies

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Epoxy coated*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

HVAC Requirements

HVAC

Minimum Temp (C)	*19*

Electrical Requirements

Power

Duplex Min. Qty	*4*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door* ☑

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
021	General Work Surface	1	Yes	CSCI
033	Tall Open Wall Shelving	1	Yes	CSCI

Department:	**08 - Applied Skills - Industrial Education**
Minimum Area:	**16.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Used for finishes, spray-painting etc.

Design Features

- Spray paint area
- Accommodate a table for 6 and 3 people standing.

Occupancy

Capacity	*6*

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Epoxy coated*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*NFPA compliant exhaust and ventilation for the spray painting*
Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Refer to Section 18 of the Electrical Code

Lighting

Luminaire Type

LED	☑

Lighting Control

	As per VSB Electrical Standards / ASHRAE Requirements
Remarks	*Refer to Section 18 of the Electrical Code*

Room Design - Door & Window Requirements

Doorsets

Remarks *Sidelight*
Other Doors *Man-door* ☑

Windows

Internal Glazing *Y/N* ☑

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
021	General Work Surface	1	Yes	CSCI
033	Tall Open Wall Shelving	1	Yes	CSCI

Department: **08 - Applied Skills - Industrial Education**

Minimum Area: **8.00** *Ceiling Height:* **2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Refer to General PDC

Additional Remarks

- Refer to diagram in Section 2.0 for PDC typologies

Occupancy

Capacity	*3*

Daylighting

☑ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(1)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Microwave (OSOI)
2. One (1) Kettle (OSOI)
3. One (1) Collaboration table (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*3*
Other Duplex Min. Qty	See General Power requirement above

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 4*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 600mm wide*
Other Doors *Man-door*☑

Windows

Internal Glazing *Y/N*☑
Window Covering *RS - Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
003	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
Note: With counter, Type-1, provided instead of tall cabinet				
021	General Work Surface	1	Yes	CSCI
039	Tall Storage Cabinet w/ Lockable Doors and Whiteboard	1	Yes	CSCI
Note: Type-2, provided instead of upper cabinets & Lower Cabinets. Total millwork width: 1200 mm				
052	Wall Hung Upper Cabinet open w/ Shelves	1	Yes	CSCI
Note: 50% uppers open, Type-1, provided instead of tall cabinet				
058	Wall Hung Upper Cabinet Lockable w/ Double Doors & Shelves	1	Yes	CSCI
Note: 50% uppers lockable, Type-1, provided instead of tall cabinet				

Department:	**08 - Applied Skills - Industrial Education**
Minimum Area:	**165.00**
Ceiling Height:	**6000.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Metals work Capable Shop

Critical Adjacencies

- Located on ground level
- Direct access to storage

Design Features

- Demonstration area for teacher
- Outdoor area for forge work and heavy grinding
- Provide access to outdoor covered chain-link enclosure storage through sectional door
- Provide area for welding with proper separation and exhaust system for MIG welding, Arc and Oxy acetylene and spot welding
- Provide power, space and proper ventilation to accommodate future jewelry kilns, and spincaster
- The workshop ceiling to be 6m high min
- Provide wall surface with plywood backing for hanging tools
- Provide area for Sandblasting
- Dedicated area to place gas cylinders with chain to hold them in place in the welding
- Eight (8) Workbenches

Occupancy

Capacity	*31*

Daylighting

☐ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*- Noise and vibration generated by equipment and activities carried in the workshops shall not impact adversely the adjacent spaces Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Sealed concrete smooth finish*

Wall Finishes

Wall Characteristics	*- Provide wall surface with plywood backing for hanging tools - All walls to have 2.75m high wall protection -Wall above 2.75m are to be treated for acoustic attenuation.*

Wall Protection

Types	*Wall protection to 2.75 m high*

Equipment and Accessories

Sink Accessories

Soap Dispenser	☑
Paper Towel Dispenser	☑

Room Accessories

Whiteboard	☑ *(2) 1200x2400*
Tackboard	☑ *(2) 1200x2400*
Short Throw Projector (OSOI)	☑
Coat Hook	☑ *To hang aprons*
Mirror	☑ *Above trough stainless steel sink*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Three (3) Welding screens (Portable) (OSOI)
2. Thirty (30) Stools (OSOI)
3. Future - Kiln for jewelry classes (OSOI)
4. Future - Spincaster (OSOI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Other	☑ *Trough stainless steel sink with multiple faucets, mirror above*

Fixtures

Floor Drain	☑
Eyewash	☑
Emergency Shower	☑
Notes	*Dedicated drain for eyewash/ shower*

Gases

Compressed Air	☑ *Qty: 8*
Natural Gas	☑
Notes	☑ *- Provide gas and compressed air connections to equipment requiring gas/air in the equipment list - Provide for flexible air connections for equipment in equipment list requiring air - 1 tank of oxygen (K type Cylinder) - 1 tank of acetylene (M type Cylinder) - 1 tank of argon (M type cylinder) - Natural gas, compressed air in the exterior covered chain link area*

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*- Dedicated fume exhaust at all equipment requiring exhaust - Fume exhaust to be have separate/ dedicated power and local on/off control*
Minimum Temp (C)	*21*
Maximum Temp (C)	*25*

Electrical Requirements

Power

General Power

- Provide (2) Emergency master shut down override button location to be confirmed with user / Owner
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Power requirement above
Retractable Overhead Duplex Min. Qty (industrial grade)	*8*

- One (1) retractable industrial quality cord reels c/w duplex receptacles per work bench

Other

Clocks ☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 10*

Lighting

Luminaire Type

LED ☑ *guard wire cage for luminaires*

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Double door - Minimum 915 mm (leaf) - Wood doors - Sidelight 1.5m wide - Overhead exterior door to exterior to have a vision panels as well*

Other Doors *Man-door* ☑ *Other* ☑ *Overhead door*

Windows

Exterior Window Required ☑ ☑ *Operable*

Internal Glazing *Y/N* ☑ *Type To exterior corridors*

Window Covering *RS - Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
037	Tall Storage Cabinet w/ 4 Doors and Adjustable Shelving & Door Shelving	2	Yes	CSCI
Note: 1220 wide, 2 in room				
043	Tall Storage Cabinet w/ 4 Doors and Adjustable Shelving	2	Yes	CSCI
Note: 1220 wide, 2 in room				
045	Vertical Storage for sheet material	1	Yes	CSCI
059	Workbench	1	Yes	CSCI

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0699	Miller Econo Twin Welder	1	No	OSOI
0700	Weir Welder	1	No	OSOI
0701	Metal Lathe	1	No	OSOI
0702	Punch	1	No	OSOI
0703	Roller	1	No	OSOI
0704	Bender	1	No	OSOI
0705	Lathe	4	No	OSOI

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0706	Drill Press #1	1	No	OSOI
0707	Drill Press #2	1	No	OSOI
0708	Vertical Mill	1	No	OSOI
0709	Forge	1	No	OSOI
0710	Anvils	3	No	OSOI
0711	Blacksmith Bench	1	No	OSOI
0712	Buffing/Sanding Wheel	1	No	OSOI
0713	Horizonal Bandsaw	1	No	OSOI
0714	Sander	1	No	OSOI
0715	Foundry	1	No	OSOI
0716	Table #1	1	No	OSOI
0717	Table #2	1	No	OSOI
0718	Pedistool Buffer	2	No	OSOI
0719	Foot Shear	3	No	OSOI
0720	Spot Welder	1	No	OSOI
0721	Table with punches	1	No	OSOI
0722	Storage Rack	2	No	OSOI
0723	Table #3	3	No	OSOI
0724	Student Table #1	6	No	OSOI
0726	Filing Cabinet	3	No	OSOI
0727	Table with roller and bender	1	No	OSOI
0728	Table #4	3	No	OSOI
0729	Cabinet with shelves	3	No	OSOI
0730	Table with Buffer	1	No	OSOI
0731	Table #5	2	No	OSOI
0732	Rolling Table	1	No	OSOI
0733	Table #6	1	No	OSOI
0734	Cabinet #1	2	No	OSOI
0735	Combustible Cabinet	1	No	OSOI
0752	Bike Repair Stand	4	No	OSOI
0753	Cabinet #3	3	No	OSOI
0754	Mobile Tool Storage #2	1	No	OSOI

Department:	**08 - Applied Skills - Industrial Education**
Minimum Area:	**25.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Storage for material, power tools, and supplies

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Epoxy coated*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Wall hung heavy duty metal shelving from floor to ceiling (OSOI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Other	☑ *Single stainless steel sink*

Sink Mounting

Counter	☑

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*Background exhaust ventilation to remove fumes from oils etc.*
Minimum Temp (C)	*19*

Electrical Requirements

Power

Duplex Min. Qty	*5*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door* ☑

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
029	Tall Cabinet w/ Work Counter	1	Yes	CSCI

09

Applied Skills–Home Economics

Last modified: **November 04 2019 01:55 PM**

Details

Typical Program Area:	**120.00**
Description:	**09- Applied Skills Home Economics**
Notes:	

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Direct connection to other Food Room with shared storage in between the two
- Near exterior doors or near elevator if located above ground level

Design Features

- Fridge and freezer must be located apart from student work units (close to teacher workstation)
- Deep sink must be within 5M of the demo desk and dishwasher must be adjacent to the deep sink
- One of the stoves, sinks, counters to be accessible only in one of the food rooms
- Washer/ dryer to be in area to reduce noise
- Include 8 units each * (7 regular units with 1 for accessibility for a total of 8 units)
- Include a demonstration station with overhead mirror and sink, stove on the demo station counter at front . Provide two duplex at the demo station at short end.
- Provide a wall oven behind to one side of demo station
- Teacher's mobile workstation
- No overhead fume/exhaust hood that obscure vision
- 1 Unit for 4 students to include: double sink, stove/oven, cupboards, drawers, counter space to double as food prep space/note-taking space, seating at counters (stools), 3 electrical duplexes (one between the sink and the stove, two between the sink and the next unit) – consider 1 unit as barrier-free only in one of the food rooms, consider power voltage for room/each Unit (final layout to be confirmed with Client for locations)
- Stove at the units to be at the outer end of the counter to facilitate space for students
- Sink to have equal amount of counter space on either sides

Occupancy

Capacity	*31*

Daylighting

☑ *Direct*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(2) 1200x2400 Sliding Whiteboard with storage behind (textbooks to be stored here)*
Tackboard	☑ *(2) 1200x2400*
Short Throw Projector (OSOI)	☑
Mirror	☑ *Mounted above demonstration table*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Table top stove (demo table) (OSOI)
2. One (1) Wall Oven (behind demo table) (OSOI)
3. One (1) Cooler (OSOI)
4. One (1) Dishwasher (OSOI)
5. Seven (6) Provide mobile tables with lockable wheels to create working island with benches (CSCI)

Existing Freezer and Fridge to be located close to teacher workstation, not as apart of student work units

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑
Notes	☑ *(7) double sinks*

Sink Types

Double	☑
Other	☑ *- (1) deep sink to accommodate equipment/ pots/ pans (by demo table)*

Sink Mounting

Counter	☑

Fixtures

Other	☑ *Commercial industrial pull down faucet for the deep double sink*

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*Provide stainless steel canopies above each stove. Exhaust rate to maintain room at negative pressure relative to adjacent areas.*
Minimum Temp (C)	*21*
Maximum Temp (C)	*25*

Electrical Requirements

Power

General Power

- Provide master override power shutdown
- Provide breaker box
- Each unit to have three (3) duplex receptacles, each on a dedicated 20A circuit
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Power requirements

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 8*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Double door - Minimum 915 mm (leaf) - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Window Covering Notes *RS- Roller shade*

Millwork Schedule

Item No.	Item Name	Qty	To be Modeled	Responsibility
06.4000.0403	Wall Hung Upper Cabinet w/ Double Doors & Shelves	1	Yes	CSCI
	Note: Shelving to be heavy duty to hold heavy kitchen equipment			
06.4000.0427	Base Cabinet w/ Drawers and Double Door Cabinet	1	Yes	CSCI
	Note: With countertop. Shelving to be heavy duty to hold heavy kitchen equipment			
06.4000.0446	Tall Storage Cabinet w/ Double Doors and Shelves	1	Yes	CSCI
	Note: Shelving to be heavy duty to hold heavy kitchen equipment			
06.4000.133	Base Cabinet w/ Drawers	1	Yes	CSCI
	Note: Bank of 4 drawers next to the stove per unit Bank of 2 deep drawers unit			
06.4000.167	Tall Open Wall Shelving	1	Yes	CSCI
	Note: Shelving to be heavy duty to hold heavy kitchen equipment			

Existing Equipment

Item No.	Item Name	Qty	To be Modeled	Responsibility
00.1094	Oven	16	No	OSOI
00.1095	Microwave	12	No	OSOI
00.1102	Mobile Counter	2	No	OSOI
00.1106	Filing Cabinet #1	3	No	OSOI
00.1107	Freezer #1	1	No	OSOI
00.1108	Fridge #1	2	No	OSOI
00.1109	Industrial Fridge	1	No	OSOI
00.1111	Washing Machine	2	No	OSOI
00.1112	Dryer	2	No	OSOI
00.1117	Washing Machine #2	1	No	OSOI
00.1118	Fridge #2	1	No	OSOI
00.1119	Fridge #3	1	No	OSOI
00.1120	Freezer #2	1	No	OSOI
00.1121	Cabinet #1	1	No	OSOI

Templated Rooms:

Room Function No.	Room No.	Room Name	RDS Status	Program Area
09.001		Food Room, 1	From 09.001 - 09.002	120.00
09.002		Food Room, 2	From 09.001 - 09.002	120.00

Department:	**09 - Applied Skills - Home Economics**
Minimum Area:	**120.00**
Ceiling Height:	**3050.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Located on ground floor
- Indirect connection to Industrial Education (specifically Woodshop/Metal shop and Drafting Room/Maker Space)
- Near exterior entrance for afterhours program

Design Features

- Accommodate all listed equipment
- Must have fabric storage room
- Must have specialty equipment/machines room
- Large table for ironing with overhead outlet.
- Raised table

Additional Remarks

- Afterhours access for courses in the space

Occupancy

Capacity	*31*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *1200mm x 2400mm*
Tackboard	☑ *1200mm x 1200mm*
Short Throw Projector (OSOI)	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Thirty (30) Stools (OSOI)
2. One (1) Teacher Desk (OSOI)
3. One (1) Office Chair (OSOI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Double	☑

Sink Mounting

Counter	☑

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Power shutoff switch
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Power requirement above
Retractable Overhead Duplex Min. Qty (industrial grade)	*1* One (1) overhead ironing station

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 8*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Double door - Minimum 915 mm (leaf) - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable Large windows*
Internal Glazing *Y/N*☑
Window Covering Notes *RS- Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
005	Base Cabinet w/ Lockable Double Doors & Adjustable Shelves	1	Yes	CSCI
	Note: with countertop, along 2 walls, space for 10 serger machines			
031	Tall Display Cabinet w/ Adjustable Shelves	1	Yes	CSCI
047	Wall Hung Cubbies, Lockable	140	Yes	CSCI
	Note: 140 cubbies minimum			

BIM ID	Item Name	Qty	To be Modeled	Responsibility
055	Wall Hung Upper Cabinet w/ Double Doors & Shelves	1	Yes	CSCI

Note: Above the sink, along 1 wall

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0849	Ironing Table #1	2	No	OSOI
0850	Drafting Table #1	7	No	OSOI
0851	Industrial Sewing Machine	15	No	OSOI
0852	Serger	13	No	OSOI
0853	Serger Table	2	No	OSOI
0856	Sewing Machine Table	12	No	OSOI
0857	Domestic Sewing Machine	48	No	OSOI
0858	Ironing Table #2	1	No	OSOI
0859	Industrial Serger	10	No	OSOI
0863	Television	1	No	OSOI
0865	Drafting Table #2	1	No	OSOI
0867	Mobile Counter	2	No	OSOI
0870	Filing Cabinet #2	1	No	OSOI
0873	Filing Cabinet #3	1	No	OSOI
0874	Cabinet #2	1	No	OSOI
0875	Storage Unit	1	No	OSOI
0876	Cabinet #3	1	No	OSOI

Department: **09 - Applied Skills - Home Economics**

Minimum Area: **45.00** *Ceiling Height:* **2750.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Located between 2 food labs

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

HVAC Requirements

HVAC

Minimum Temp (C)	*19*

Electrical Requirements

Power

Duplex Min. Qty	*2*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door* ☑

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
040	Tall Storage Cabinet w/ Lockable Double Doors and Shelves	1	Yes	CSCI

Note: Shelving to be heavy duty. Secure storage tall shelving along all the walls (Storage e.g. blenders, staff function dishes, baking pans, etc.); shared and located between 2 Food Labs; lockable Lengths of each cabinet unit to be confirmed with the user/client. To be around 3 sides of room.

10

Applied Skills–Business Education & Computers

Department:	**10 - Applied Skills - Business Education & Computers**
Minimum Area:	**117.00**
Ceiling Height:	**3050.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Must Accommodate 30 students

Design Features

- U shaped layout: workstation on the edges and collaborative space in the middle. Middle are to have moveable desk for flexibility

Additional Remarks

- Lab used for testing and learning purpose

Occupancy

Capacity	*30*

Daylighting

☑ *Direct* ☑ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(3) 1200 x 2400 panel sliding whiteboard*
Tackboard	☑ *1200x2400 tack board*
Short Throw Projector (OSOI)	☑
Computer	☑ *Thirty (30) (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Thirty (30) Student Chairs (OSOI)
2. Six (6) Tables Mobile for computers (OSOI)
3. One (1) Teacher Desk (OSOI)
4. One (1) Office Chair (OSOI)
5. One (1) Teacher Computer Workstation (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Disperse power at the perimeter teaching walls for thirty (30) computer to be at 1m high i.e. above table/cabinet and below window
- Provide power from above in the middle of the classroom
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Power requirement above
Retractable Overhead Duplex Min. Qty (industrial grade)	*6*

- Six (6) overhead middle of classroom

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 52*
Remarks	*- Disperse 32 data drops and receptacles at the perimeter teaching walls to be at 1m height above table/cabinet and below window - Provide 12 ceiling mounted data drops in the middle of the classroom*

Lighting

Luminaire Type

LED	☑

Lighting Control

	As per VSB Electrical Standards / ASHRAE Requirements
Multi-Level	☑ *three zones of lighting left/ right and middle*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N*☑
Window Covering Notes *RS- Roller Shade (Exterior and interior glazing)*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
003	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
	Note: - 80% of shelving to be lockable, 20 % open, along window wall			
005	Base Cabinet w/ Lockable Double Doors & Adjustable Shelves	1	Yes	CSCI
	Note: - 80% of shelving to be lockable, 20 % open, along window wall			
015	Computer Work Surface	1	Yes	CSCI
	Note: At perimeter of room			
055	Wall Hung Upper Cabinet w/ Double Doors & Shelves	1	Yes	CSCI
	Note: - Upper storage along perimeter above computers (except @ window walls), underlit			

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0697	Filing Cabinet #3	1	No	OSOI

Business Education Classroom
Room No. 10.002

Department: **10 - Applied Skills - Business Education & Computers**

Minimum Area: **77.00** *Ceiling Height:* **3050.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Must accommodate 30 students

Design Features

- Mobile teaching station

Occupancy

Capacity	*30*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Ceiling Finishes

Ceiling Characteristics	*ACT*

Wall Finishes

Wall Characteristics	*Painted GWB*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(2) 1200x2400*
Tackboard	☑ *(2) 1200x2400*
Short Throw Projector (OSOI)	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Flexible: tables and chairs for thirty (30) people (OSOI)
2. Thirty (30) computer workstations (OSOI)
3. Laptop charging carts to accommodate thirty (30) laptops (OSOI)

Plumbing Requirements

Fixtures

Notes

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*
Remarks	

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 42*
Remarks	*- Incl. hardwiring & wireless internet capability*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N*☑
Window Covering Notes *RS- Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
005	Base Cabinet w/ Lockable Double Doors & Adjustable Shelves	1	Yes	CSCI
	Note: 100% lockable, along the door wall, recessed in the wall			
040	Tall Storage Cabinet w/ Lockable Double Doors and Shelves	1	Yes	CSCI
	Note: 100% lockable along the door wall, same as typical class room. Provide charging outlets for 30 laptops			
055	Wall Hung Upper Cabinet w/ Double Doors & Shelves	1	Yes	CSCI
	Note: - 100% lockable upper storage along perimeter above computers along the back of the classroom, under-lit			

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0636	Filing Cabinet #1	3	No	OSOI
0645	Printer #1	1	No	OSOI
0646	Printer #2	2	No	OSOI
0653	Filing Cabinet #2	3	No	OSOI
0656	Printer #3	1	No	OSOI
0659	Filing Cabinet #2	1	No	OSOI
0663	Printer #4	1	No	OSOI
0665	Plotter	1	No	OSOI
0668	Light Table	1	No	OSOI
0672	Mailbox Cabinet #1	1	No	OSOI
0679	Mailbox Cabinet #2	1	No	OSOI

Business Education Classroom
Room No. 10.002

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0680	Cabinet #3	1	No	OSOI

Department:	**10 - Applied Skills - Business Education & Computers**
Minimum Area:	**117.00**
Ceiling Height:	**3050.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Easy access to Yearbook classroom and Digital Arts for shared resources

Design Features

- Must Accommodate 30 students
- U shaped layout: workstation on the edges and collaborative space in the middle. Middle are to have moveable desk for flexibility

Occupancy

Capacity	*30*

Daylighting

☑ *Direct* ☑ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(3) 1200x2400, sliding*
Tackboard	☑ *(1) 1200x2400*
Short Throw Projector (OSOI)	☑
Computer	☑ *Thirty (30) (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Thirty (30) Student Chairs (OSOI)
2. Six (6) Tables Mobile for computers (OSOI)
3. One (1) Teacher Desk (OSOI)
4. One (1) Office Chair (OSOI)
5. One (1) Teacher Computer Workstation (OSOI)

Plumbing Requirements

Fixtures

Notes

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Disperse power at the perimeter teaching walls for thirty (30) computer to be at 1m high i.e. above table/cabinet and below window
- Provide power from above in the middle of the classroom
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Power requirement above
Retractable Overhead Duplex Min. Qty (industrial grade)	*6* • Six (6) overhead middle of classroom

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 52*
Remarks	*- Disperse 32 data drops and receptacles at the perimeter teaching walls to be at 1m height above table/cabinet and below window - Provide 12 ceiling mounted data drops in the middle of the classroom - Provide 6 SM of floor space for a server in a dedicated switch closet associated with lab*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Multi-Level ☑ *3 zones - left, right and middle (on/off control)*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*

Other Doors *Man-door* ☑

Windows

Exterior Window Required ☑ ☑ *Operable*

Internal Glazing *Y/N* ☑

Window Covering Notes *RS- Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
003	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
	Note: - 100% of shelving to be lockable			
005	Base Cabinet w/ Lockable Double Doors & Adjustable Shelves	1	Yes	CSCI
	Note: - 100% of shelving to be lockable			
015	Computer Work Surface	1	Yes	CSCI
	Note: At perimeter of room			
055	Wall Hung Upper Cabinet w/ Double Doors & Shelves	1	Yes	CSCI
	Note: - Upper storage along perimeter above computers, underlit			

Department:	**10 - Applied Skills - Business Education & Computers**
Minimum Area:	**15.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Refer to General PDC

Additional Remarks

- Refer to diagram in Section 2.0 for PDC typologies

Occupancy

Capacity	*8*

Daylighting

☑ *Direct* ☑ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Whiteboard ☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Kettle (OSOI)
2. Tables (6-8 people) (OSOI)
3. Office Chairs (6-8 people) (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Below counter outlets for microwave, kettle, and fridge
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*7*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks ☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 6*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 600mm wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N*☑
Window Covering *RS - Roller Shade*
Window Covering Notes *RS - Roller Shade (exterior and internal glazing)*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
003	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
Note: With counter, Type-1, provided instead of tall cabinet				
021	General Work Surface	1	Yes	CSCI
039	Tall Storage Cabinet w/ Lockable Doors and Whiteboard	1	Yes	CSCI
Note: Type-2, provided instead of upper cabinets & Lower Cabinets. Total millwork width: 1800 mm				
052	Wall Hung Upper Cabinet open w/ Shelves	1	Yes	CSCI
Note: 50% uppers open, Type-1, provided instead of tall cabinet				
058	Wall Hung Upper Cabinet Lockable w/ Double Doors & Shelves	1	Yes	CSCI
Note: 50% uppers lockable, Type-1, provided instead of tall cabinet				

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0670	Microwave	2	No	OSOI
0671	Mini Fridge	1	No	OSOI

Department:	**10 - Applied Skills - Business Education & Computers**
Minimum Area:	**25.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Over the counter store

Critical Adjacencies

- School Store must be located near high traffic area
- Close proximity to Business Education classrooms
- Clear path to fridge from front sale counter

Design Features

- Lockable sliding/ rolling gate to corridor
- Display case from school store into school corridor
- Space for Mannequin display

Occupancy

Capacity	*4*

Daylighting

☑ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Whiteboard	☑
Tackboard	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Cooler (OSOI)
2. One (1) Small freezer (OSOI)
3. One (1) Fridge (beverage) (OSOI)
4. Two (2) Microwave (OSOI)
5. One (1) Hot water urns (OSOI)
6. Two (2) Blenders (OSOI)
7. Two (2) Slushee machine (OSOI)
8. One (1) Desk (OSOI)
9. One (1) Office chair (OSOI)
10. Two (2) Cash registers (OSOI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Other	☑ *Extra deep double sink*

Sink Mounting

Counter	☑

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*25*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required
- Provide at transaction window for point of sale terminals

Duplex Min. Qty	*4*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 2*
Remarks	*Data drops for point of sale terminals*

Lighting

Luminaire Type

LED	☑
Other	☑ *Display lighting for mannequin (clothing)*

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide - Interior security shutter will have small opening or perforation for security*
Other Doors *Man-door* ☑ *Other* ☑ *Interior Security Shutter*

Windows

Internal Glazing *Y/N* ☑ *Type Display to corridor*
Window Covering *RS - Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
006	Base Cabinet w/ Sliding Doors & Adjustable Shelves	1	Yes	CSCI
009	Base Cabinet, Glazed, w/ Solid Counter, Lockable Sliding Glass Doors	1	Yes	CSCI
017	Counter, no base cabinet	1	Yes	CSCI
032	Tall Display Cabinet, no Shelves	1	Yes	CSCI
Note: For a mannequin display				
053	Wall Hung Upper Cabinet Open, 450 depth	1	Yes	CSCI

Existing Equipment Unique

School Store
Room No. 10.005

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0684	Popcorn Maker	1	No	OSOI

Department:	**10 - Applied Skills - Business Education & Computers**
Minimum Area:	**117.00**
Ceiling Height:	**3050.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Must accommodate 30 students

Occupancy

Capacity	*30*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(3)panel sliding whiteboard*
Tackboard	☑ *1200x2400 tack board (locate on wall opposite exterior windows)*
Short Throw Projector (OSOI)	☑
Computer	☑ *Thirty (30) (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Thirty (30) Student Chairs (OSOI)
2. Six (6) Tables Mobile for computers (OSOI)
3. One (1) Teacher Desk (OSOI)
4. One (1) Office Chair (OSOI)
5. One (1) Teacher Computer Workstation (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Disperse power at the perimeter teaching walls for thirty (30) computer to be at 1m high i.e. above table/cabinet and below window
- Provide power from above in the middle of the classroom
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Power requirement above
Retractable Overhead Duplex Min. Qty (industrial grade)	*6*

- Six (6) overhead middle of classroom

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 52*
Remarks	*- Disperse 32 data drops and receptacles at the perimeter teaching walls to be at 1m height above table/cabinet and below window - Provide 12 ceiling mounted data drops in the middle of the classroom*

Lighting

Luminaire Type

LED	☑

Lighting Control

	As per VSB Electrical Standards / ASHRAE Requirements
Multi-Level	☑ *3 zones - Left, right, middle (ON/OFF control)*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N*☑
Window Covering Notes *RS- Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
003	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
	Note: 66% of window cabinets away from teaching wall to be open shelving under windows			
005	Base Cabinet w/ Lockable Double Doors & Adjustable Shelves	1	Yes	CSCI
	Note: 33% of window wall cabinets to be lockable near teaching wall.			

Department:	**10 - Applied Skills - Business Education & Computers**
Minimum Area:	**117.00**
Ceiling Height:	**3050.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Must Accommodate 30 students

Design Features

- U shaped layout: workstation on the edges and collaborative space in the middle.
- Middle are to have moveable desk for flexibility

Additional Remarks

- Lab used for testing purpose

Occupancy

Capacity	*30*

Daylighting

☑ *Direct* ☑ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(3) 1200 x 2400 panel sliding whiteboard*
Tackboard	☑ *1200x2400 tack board*
Short Throw Projector (OSOI)	☑
Computer	☑ *Thirty (30) (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Thirty (30) Student Chairs (OSOI)
2. Six (6) Tables Mobile for computers (OSOI)
3. One (1) Teacher Desk (OSOI)
4. One (1) Office Chair (OSOI)
5. One (1) Teacher Computer Workstation (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Disperse power at the perimeter teaching walls for thirty (30) computer to be at 1m high i.e. above table/cabinet and below window
- Provide power from above in the middle of the classroom
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Power requirement above
Retractable Overhead Duplex Min. Qty (industrial grade)	*6*

- Six (6) overhead middle of classroom

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 52*
Remarks	*- Disperse 32 data drops and receptacles at the perimeter teaching walls to be at 1m height above table/cabinet and below window - Provide 12 ceiling mounted data drops in the middle of the classroom*

Lighting

Luminaire Type

LED	☑

Lighting Control

	As per VSB Electrical Standards / ASHRAE Requirements
Multi-Level	☑ *3 zones - Left, right, middle (ON/OFF control)*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N*☑
Window Covering Notes *RS- Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
003	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
Note: 50% lockable				
003	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
015	Computer Work Surface	1	Yes	CSCI
055	Wall Hung Upper Cabinet w/ Double Doors & Shelves	1	Yes	CSCI

11
Special Education

Department:	**11 - Special Education 01 - Learning Strategies Program (LSP)**		
Minimum Area:	**100.00**	*Ceiling Height:* **3050.00**	

Room Design Requirements

General Design Requirements

Activities and Functions

- 15 with ability to accommodate up to 30 students;

Critical Adjacencies

- Bookroom and test rooms require adjacency

Design Features

- Teachers' workstation at front of room

Occupancy

Capacity	*30*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*- Refer to the Acoustic and Noise Control appendix of the Statement of Requirements.*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Ceiling Finishes

Ceiling Characteristics	*ACT*

Wall Finishes

Wall Characteristics	*Painted GWB*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(2) 1200x2400 located in loud zone*
Tackboard	☑ *(2) 1200x2400 located in loud zone*
Short Throw Projector (OSOI)	☑ *Located in loud zone*
Computer	☑ *One (1) Computer Workstation (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty *6*

Other Duplex Min. Qty See General Power requirement above

Communication Requirements

Communication Systems

Telephone ☑ *CAT6 Drop Min Qty: 1*

Data ☑ *CAT6 Drop Min Qty: 8*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*

Other Doors *Man-door*☑

Windows

Internal Glazing *Y/N*☑

Window Covering *RS - Roller Shade*

Window Covering Notes *Exterior and internal glazing*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
005	Base Cabinet w/ Lockable Double Doors & Adjustable Shelves	1	Yes	CSCI
015	Computer Work Surface	1	Yes	CSCI
	Note: Note: System furniture for 12 computers. Half in quite zone and half in loud zone if furniture system is provided for the workstation make ensure no running wires are on the floor creating tripping hazard.			
035	Tall Open Wall Shelving w/ Lip	1	Yes	CSCI

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0541	Microwave	1	No	OSOI
0543	Study Carrel	8	No	OSOI
0545	Filing Cabinet #2	11	No	OSOI
0548	Printer #1	1	No	OSOI
0550	Printer #2	3	No	OSOI

Last modified: **February 19 2020 02:55 PM**

Details

Typical Program Area: **6.00**
Description: **11- Special Education**
Notes:

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Direct visual access to classroom such that each student can be visually supervised by teacher from main space. But do not maximize the visual connection that it creates visual distraction for student.

Occupancy

Capacity	*1*

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*- Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(1) 1200x1200 Whiteboard*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Desk (OSOI)
2. One (1) Chair (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

Duplex Min. Qty	*1*

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 4*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 600mm wide*
Other Doors *Man-door*☑

Windows

Internal Glazing *Y/N* ☑ *Type Visual access to classroom*
Window Covering *RS - Roller Shade*

Templated Rooms:

Room Function No.	Room No.	Room Name	RDS Status	Program Area
11.01.004		Small Testing Room, 1	From 11.01.004 - 11.01.007	6.00
11.01.005		Small Testing Room, 2	From 11.01.004 - 11.01.007	6.00
11.01.006		Small Testing Room, 3	From 11.01.004 - 11.01.007	6.00
11.01.007		Small Testing Room, 4	From 11.01.004 - 11.01.007	6.00

Department:	**11 - Special Education 01 - Learning Strategies Program (LSP)**
Minimum Area:	**16.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Must accommodate 4-6 students

Critical Adjacencies

- Direct connection to counselling
- Flexible tables/ chairs (comfortable seating)

Design Features

- Discrete entrance, not too public
- Ultraviolet lighting
- Fibre optics sensory kits

Occupancy

Capacity	*6*

Daylighting

☐ *Indirect* ☑ *None*

Acoustics

Acoustic Requirements

Comments	*- Refer to Appendix 1C- Acoustic and Noise Control Ratings - Provide acoustic wall paneling*

Room Finishes

Floor Finishes

Flooring Characteristics	*Carpet Tile*

Ceiling Finishes

Ceiling Characteristics	*ACT*

Wall Finishes

Wall Characteristics	*Acoustic wall paneling*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Soft seating (OSOI) Quantities Owner to Confirm
2. Flexible tables & chairs (comfortable seating) (OSOI) Quantities Owner to Confirm

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

Duplex Min. Qty	*4*

- One per wall

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 2*

Lighting

Luminaire Type

LED	☑ *no fluorescent lights (warmer colour temp)*
Other	☑ *Ultraviolet Lighting and Fibre Optic Sensory Kit (selection will be confirmed with Owner)*

Lighting Control

	As per VSB Electrical Standards / ASHRAE Requirements
Dimmer	☑

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Internal Glazing *Y/N* ☑ *Type Visual access to counselling*
Window Covering *RS - Roller Shade*

Department:	**11 - Special Education 01 - Learning Strategies Program (LSP)**		
Minimum Area:	**8.00**	*Ceiling Height:* **3050.00**	

Room Design Requirements

General Design Requirements

Activities and Functions

- Must accommodate 4-6 people

Critical Adjacencies

- Access through LSP classroom in addition to access from public corridor.

Design Features

- Must be flexible space for teachers, teaching assistants, social workers etc. to hold meetings.

Occupancy

Capacity	*6*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *1200x1200*
Tackboard	☑ *1200x1200*
Short Throw Projector (OSOI)	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Conference Table (4-6 people) Quantities Owner to Confirm (OSOI)
2. Chairs (4-6 people) (OSOI)
3. LCD Screen (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty *4*

- One per wall

Other Duplex Min. Qty

See General Power requirement above

Other

Clocks ☑

Communication Requirements

Communication Systems

Telephone ☑ *CAT6 Drop Min Qty: 1*
Data ☑ *CAT6 Drop Min Qty: 10*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N*☑
Window Covering Notes *RS- Roller Shade*

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0545	Filing Cabinet #2	1	No	OSOI

Department:	**11 - Special Education 02 - Life Skills (LS)**
Minimum Area:	**117.00**
Ceiling Height:	**3050.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Direct adjacency to parking lot and school bus drop off area
- Adjacent to sensory room

Design Features

- Physiotherapy area 30sm
- Kitchen 10sm
- Dedicated lift for each space (500kg lifting capacity)
- Physiotherapy area to have floor and wall mats
- Physiotherapy zone, includes physiotherapy wall mounted adjustable height bed/table
- Equipment charging area
- Moveable transparent divide to separate teaching area from general quiet zone. Teaching zone to have TV media area
- Lockable storage units dispersed in room
- Enclosed shelving for books, games, learning tools, etc.
- Storage units for stools, taping supplies, assistive devices, etc. large mirror, must have curtain to block off zone from classroom
- Partitions such as curtains or sliding transparent doors at physiotherapy for student sensory therapy
- Single track ceiling lift in Physiotherapy/General teaching area with power outlet near ceiling

Additional Remarks

- Follow VCH OT/PT standards

Occupancy

Capacity	*18*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Ceiling Finishes

Ceiling Characteristics	*ACT*

Wall Finishes

Wall Characteristics	*Painted GWB*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(2) 1200 x 2400*
Tackboard	☑ *(4) 1200 x 2400*
Short Throw Projector (OSOI)	☑ *(2) (physio and general teaching area)*
Mirror	☑ *300 AFF 1800 H x 1500w (classroom area)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Dishwasher (OSOI)
2. One (1) Stove hood (OSOI)
3. One (1) Washer (stacked) (OSOI)
4. One (1) Dryer (stacked) (OSOI)
5. One (1) Microwave (OSOI)
6. One (1) TV (OSOI)
7. One (1) Physio Bed (OSOI)
8. One (1) single track ceiling lift (OSOI)
9. Track/structural support for ceiling lift (CSCI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Double	☑

Sink Mounting

Counter	☑

Fixtures

Floor Drain	☑

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Must have dedicated gantry track ceiling lift (with power outlet near ceiling)
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*8*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 10*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Dimmer ☑

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N* ☑ *Type direct visual access into sensory room from classroom, no windows to corridor*
Window Covering Notes *RS- Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
003	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
004	Base Cabinet w/ Double Doors & Adjustable Shelves	1	Yes	CSCI
040	Tall Storage Cabinet w/ Lockable Double Doors and Shelves	1	Yes	CSCI
046	Wall Hung Cubbies	10	Yes	CSCI
055	Wall Hung Upper Cabinet w/ Double Doors & Shelves	1	Yes	CSCI

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0581	Stove Oven	1	No	OSOI
0582	Fridge #3	1	No	OSOI
0583	Piano	1	No	OSOI

Department: **11 - Special Education 02 - Life Skills (LS)**

Minimum Area: **6.00** *Ceiling Height:* **2750.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Direct adjacency and direct visual access to LS classroom.

Occupancy

Capacity	*3*

Daylighting

☑ *Indirect*

Acoustics

Acoustic Requirements

Comments	*- Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Computer	☑ *One (1) Computer Workstation (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Desk (OSOI)
2. One (1) Office chair (OSOI)
3. One (1) Filing cabinet (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*2*

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 6*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 600mm wide*
Other Doors *Man-door*☑

Windows

Internal Glazing *Y/N*☑
Window Covering Notes *RS- Roller Shade*

Department: **11 - Special Education 02 - Life Skills (LS)**

Minimum Area: **12.00** *Ceiling Height:* **2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- 4 to 6 students

Critical Adjacencies

- Direct adjacency and visual connection into Classroom, Life Skills (LS)

Design Features

- Ultraviolet lighting
- Fibre optics sensory kits

Occupancy

Capacity	*6*

Daylighting

☐ *Indirect* ☑ *None*

Acoustics

Acoustic Requirements

Comments	*- Refer to Appendix 1C- Acoustic and Noise Control Ratings - Acoustic wall paneling*

Room Finishes

Floor Finishes

Flooring Characteristics	*Carpet tile*

Ceiling Finishes

Ceiling Characteristics	*ACT*

Wall Finishes

Wall Characteristics	*- Acoustic wall paneling*

Equipment and Accessories

Room Accessories

Short Throw Projector (OSOI) ☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Flexible tables and chairs (OSOI) Quantities Owner to confirm
2. One (1) single track ceiling lift (OSOI)
3. Track/structural support for ceiling lift (CSCI)
4. Wall mounted touch screen (viewing for wheel chair user) (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Must have dedicated gantry track ceiling lift (with power outlet near ceiling)
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 3*
Remarks	*Data drop provided for touch screen*

Lighting

Luminaire Type

LED	☑
Other	☑ *Ultraviolet Lighting and Fibre Optic Sensory Kit (selection will be confirmed with Owner)*

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Dimmer	☑

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door* ☑

Windows

Internal Glazing *Y/N* ☑ *Type - glazing into skills room for teacher visibility*
Window Covering Notes *RS- Roller Shade*

Department:	**11 - Special Education 02 - Life Skills (LS)**
Minimum Area:	**14.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Unisex barrier- free washroom

Design Features

- Space for adjustable height change bed/table
- Must have dedicated gantry track ceiling lift (with power outlet near ceiling)
- Provide turning radius of 1520 mm - 1830mm
- No toilet tanks or pipes sticking out of the back - so that the commode can be centered over the bowl. Also, to prevent child from ganging their head against a pipe fixture.
- No air dryer which can be startling for the students

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*- Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient Flooring (smooth surface)*

Ceiling Finishes

Ceiling Characteristics	*ACT*

Wall Finishes

Wall Characteristics	*Tile*

Equipment and Accessories

Sink Accessories

Soap Dispenser	☑
Paper Towel Dispenser	☑
Paper Towel Waste	☑
Air Dryer	☑

Room Accessories

Coat Hook	☑
Mirror	☑ *ADA Compliant, Framed*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Electrical change table (CSCI)
2. One (1) single track ceiling lift (OSOI)
3. Structural support to received track for ceiling lifts (CSCI)
4. Grab bars (CSCI) (Mounted on both side of the toilet - one swing down from the wall so they can moved out of the way if necessary) Elcoma, Configuration 96 or acceptable equivalent
5. Garbage Contain Free standing (OSOI)
6. Toilet Paper Dispenser (CSCI)
7. Sanitary Napkin Disposal (CSCI)
8. Diaper Disposal (CSCI)
9. Shower Seat (CSCI)
10. Shower Curtain Rod (CSCI)
11. Shower Curtain (CSCI)
12. Shower Curtain Hooks (CSCI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Handwash	☑

Sink Mounting

Counter	☑

Fixtures

Barrier Free WC	☑ *Qty: 380mm width x 660mm depth*
Floor Drain	☑
Other	☑ *Hand-held shower*

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*

Electrical Requirements

Power

General Power

- Must have dedicated gantry track ceiling lift (with two (2) outlet near ceiling)
- One (1) outlet at electric change table
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required
- GFI receptacle beside sink

Duplex Min. Qty	*1*
Other Duplex Min. Qty	See General Power requirement above

Communication Requirements

Communication Systems

Remarks	*Two (2) panic/duress stations. One install @ 300mm A.F.F. and another at 1200 A.F.F.*

Lighting

Luminaire Type

LED	☑

Lighting Control

Remarks	*As per VSB Electrical Standards / ASHRAE Requirements* *ADA accessible - not motion sensor*

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door* ☑

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
003	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
	Note: For storage of personal items for up to 8 students			
052	Wall Hung Upper Cabinet open w/ Shelves	1	Yes	CSCI
	Note: For storage of personal items for up to 8 students			

Department:	**11 - Special Education 02 - Life Skills (LS)**
Minimum Area:	**10.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Unisex barrier-free washroom

Critical Adjacencies

- Locate inside of classroom

Design Features

- Space for adjustable height change bed/table
- Must have dedicated gantry track ceiling lift (with power outlet near ceiling)
- Provide turning radius of 1520 mm - 1830mm
- No toilet tanks or pipes sticking out of the back - so that the commode can be centered over the bowl. Also, to prevent child from ganging their head against a pipe fixture.
- No air dryer which can be startling for the students

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*- Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient Flooring (smooth surface)*

Ceiling Finishes

Ceiling Characteristics	*ACT*

Wall Finishes

Wall Characteristics	*Tile*

Equipment and Accessories

Sink Accessories

Soap Dispenser	☑
Paper Towel Dispenser	☑
Paper Towel Waste	☑
Air Dryer	☑

Room Accessories

Coat Hook	☑
Mirror	☑ *ADA Compliant, Framed*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Electrical change table (CSCI)
2. One (1) single track ceiling lift (OSOI)
3. Structural support to received track for ceiling lifts (CSCI)
4. Grab bars (CSCI) (Mounted on both side of the toilet - one swing down from the wall so they can moved out of the way if necessary) Elcoma, Configuration 96 or acceptable equivalent
5. Garbage Contain Free standing (OSOI)
6. Toilet Paper Dispenser (CSCI)
7. Sanitary Napkin Disposal (CSCI)
8. Diaper Disposal (CSCI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Handwash	☑

Sink Mounting

Counter	☑

Fixtures

Barrier Free WC	☑
Floor Drain	☑

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*

Electrical Requirements

Power

General Power

- Must have dedicated gantry track ceiling lift (with two (2) outlet near ceiling)
- One (1) outlet at electric change table
- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required
- GFI receptacle beside sink

Duplex Min. Qty	*1*
Other Duplex Min. Qty	See General Power requirement above

Communication Requirements

Communication Systems

Remarks	*Two (2) panic/duress stations. One install @ 300mm A.F.F. and another at 1200 A.F.F.*

Lighting

Luminaire Type

LED	☑

Lighting Control

	As per VSB Electrical Standards / ASHRAE Requirements
Remarks	*ADA accessible - not motion sensor*

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door* ☑

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
003	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
	Note: For storage of personal items for up to 8 students			
052	Wall Hung Upper Cabinet open w/ Shelves	1	Yes	CSCI
	Note: For storage of personal items for up to 8 students			

Department: **11 - Special Education 02 - Life Skills (LS)**

Minimum Area: **8.00** *Ceiling Height:* **2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Equipment storage

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*-Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Sealed concrete*

Ceiling Finishes

Ceiling Characteristics	*ACT*

Wall Finishes

Wall Characteristics	*Painted GWB*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

HVAC Requirements

HVAC

Minimum Temp (C)	*19*

Electrical Requirements

Power

Duplex Min. Qty	*1*

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 2*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door* ☑

Department:	**11 - Special Education 03 - Life Assistance Life Skills (LALS)**
Minimum Area:	**6.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- 1 workstation and place to meet with 1-2 students
- Visual access to the classroom

Critical Adjacencies

- Adjacent to LALS classroom

Occupancy

Capacity	*3*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*- Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Computer	☑ *One (1) Computer Workstation (OSOI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Desk (OSOI)
2. One (1) Office Chair (OSOI)
3. One (1) Filing Cabinet (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*2*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 6*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 600mm wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N*☑
Window Covering Notes *RS- Roller Shade*

Department:	**11 - Special Education 03 - Life Assistance Life Skills (LALS)**
Minimum Area:	**85.00**
Ceiling Height:	**3050.00**

Room Design Requirements

General Design Requirements

Design Features

- Kitchen 10sm (teaching kitchen) with mobile island for demonstrations

Occupancy

Capacity	*16*

Daylighting

☑ *Direct*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Short Throw Projector (OSOI)	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Mobile Island (CSCI)
2. One (1) Dishwasher (OSOI)
3. One (1) Washer (stackable) (OSOI)
4. One (1) Dryer (stackable) (OSOI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Double	☑

Sink Mounting

Counter	☑

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty *6*

Other Duplex Min. Qty

See General Power requirement above

Other

Clocks ☑

Communication Requirements

Communication Systems

Telephone ☑ *CAT6 Drop Min Qty: 1*

Data ☑ *CAT6 Drop Min Qty: 8*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Dimmer ☑

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*

Other Doors *Man-door* ☑

Windows

Exterior Window Required ☑ ☑ *Operable View to calm and serene exterior view*

Window Covering Notes *RS- Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
004	Base Cabinet w/ Double Doors & Adjustable Shelves	1	Yes	CSCI
	Note: with countertop, near to washer/ dryer. Drawers to be lockable			
013	Bookcase Tall Cabinet w/ Open Shelving	1	Yes	CSCI
025	Mobile Island w/ Storage	1	Yes	CSCI
055	Wall Hung Upper Cabinet w/ Double Doors & Shelves	1	Yes	CSCI
	Note: Upper cabinet to have microwave space			

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0517	Fridge	1	No	OSOI
0518	Oven	1	No	OSOI
0519	Microwave	1	No	OSOI
0531	Filing Cabinet #1	3	No	OSOI

Department:	**11 - Special Education 03 - Life Assistance Life Skills (LALS)**		
Minimum Area:	**16.00**	*Ceiling Height:* **2750.00**	

Room Design Requirements

General Design Requirements

Activities and Functions

- 4-6 students

Critical Adjacencies

- Visual access into classroom for teacher visibility

Design Features

- Ceiling equipped with structural support for future equipment
- Ceiling mounted sensory swing
- Ceiling must have more structural support to accommodate future addition of swings/equipment
- Ultraviolet Lighting
- Fibre Optic Sensory Kit

Occupancy

Capacity	*6*

Daylighting

☐ *Indirect* ☑ *None*

Acoustics

Acoustic Requirements

Comments	*- Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Wall Finishes

Wall Characteristics	*acoustic wall paneling*

Equipment and Accessories

Room Accessories

Short Throw Projector (OSOI) ☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Softer seating (OSOI) Quantities Owner to confirm
2. Flexible tables & chairs (OSOI) Quantities Owner to confirm

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty *4*

- one per wall

Other Duplex Min. Qty

See General Power requirement above

Other

Clocks ☑

Communication Requirements

Communication Systems

Data ☑ *CAT6 Drop Min Qty: 6*

Lighting

Luminaire Type

LED ☑

Other ☑ *Ultraviolet Lighting and Fibre Optic Sensory Kit (selection will be confirmed with Owner)*

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Dimmer ☑

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*

Other Doors *Man-door*☑

Windows

Internal Glazing *Y/N*☑

Window Covering Notes *RS- Roller Shade*

Department:	**11 - Special Education 04 - Learning Assistance Centre (LAC)**		
Minimum Area:	**70.00**	*Ceiling Height:* **3050.00**	

Room Design Requirements

General Design Requirements

Activities and Functions

- Accommodate 30 students

Critical Adjacencies

- Can be on any level
- Must have direct access and direct visual access to PDC

Design Features

- Class layout similar to General Instruction classrooms
- Flexible furniture, individual desks
- Teacher's workstation at front of room

Occupancy

Capacity	*30*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *1200x2400*
Tackboard	☑ *1200x2400*
Short Throw Projector (OSOI)	☑
Computer	☑ *Eight (8) (OSOI) (4 to have hardwire connection, 4 will be on wifi)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Thirty (30) Student Desk (OSOI)
2. Thirty (30) Student Chair (OSOI)
3. One (1) Teacher Chair (OSOI)
4. One (1) Teacher Desk (OSOI)
5. One (1) Teacher Computer Workstation (OSOI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Double	☑

Sink Mounting

Counter	☑

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 16*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide - No windows towards corridor*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N* ☑ *Type only small windows to corridor, visual access to PDC*
Window Covering Notes *RS- Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
005	Base Cabinet w/ Lockable Double Doors & Adjustable Shelves	1	Yes	CSCI
Note: At room permimeter				
015	Computer Work Surface	1	Yes	CSCI
033	Tall Open Wall Shelving	1	Yes	CSCI
Note: At room perimeter				
055	Wall Hung Upper Cabinet w/ Double Doors & Shelves	1	Yes	CSCI

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0568	Filing Cabinet	1	No	OSOI

Department:	**11 - Special Education 04 - Learning Assistance Centre (LAC)**		
Minimum Area:	**70.00**	*Ceiling Height:* **3050.00**	

Room Design Requirements

General Design Requirements

Activities and Functions

- Accommodate 30 students

Critical Adjacencies

- Can be on any level
- Must have direct access and direct visual access to PDC

Design Features

- Class layout similar to General Instruction classrooms
- Flexible furniture, individual desks
- Teacher's workstation at front of room

Occupancy

Capacity	*30*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *1200x2400*
Tackboard	☑ *1200x2400*
Short Throw Projector (OSOI)	☑
Computer	☑ *Eight (8) (OSOI) (4 hardwired, 4 on WIFI)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Thirty (30) Student Desk (OSOI)
2. Thirty (30) Student Chair (OSOI)
3. One (1) Teacher Chair (OSOI)
4. One (1) Teacher Desk (OSOI)
5. One (1) Teacher Computer Workstation (OSOI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Double	☑

Sink Mounting

Counter	☑

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 16*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide - No windows towards corridor*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Internal Glazing *Y/N* ☑ *Type only small windows to corridor, visual access to PDC*
Window Covering *RS- Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
004	Base Cabinet w/ Double Doors & Adjustable Shelves	1	Yes	CSCI
Note: At perimeter, 50%				
005	Base Cabinet w/ Lockable Double Doors & Adjustable Shelves	1	Yes	CSCI
Note: At perimeter, 50%				
015	Computer Work Surface	1	Yes	CSCI
033	Tall Open Wall Shelving	1	Yes	CSCI
Note: Along some wall perimenters				
055	Wall Hung Upper Cabinet w/ Double Doors & Shelves	1	Yes	CSCI

Existing Equipment Unique				
BIM ID	**Item Name**	**Qty**	**To be Modeled**	**Responsibility**
0558	Mini Fridge	2	No	OSOI
0559	Microwave	2	No	OSOI

Department: **11 - Special Education 04 - Learning Assistance Centre (LAC)**

Minimum Area: **8.00** *Ceiling Height:* **2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Refer to General PDC

Additional Remarks

- Refer to diagram in Section 2.0 for PDC typologies

Occupancy

Capacity	*3*

Daylighting

☑ *Indirect*

Acoustics

Acoustic Requirements

Comments	*- Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Resilient*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(1)*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Microwave (OSOI)
2. One (1) Kettle (OSOI)
3. One (1) Collaboration table (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*3*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 2*
Data	☑ *CAT6 Drop Min Qty: 4*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 600mm wide*
Other Doors *Man-door* ☑

Windows

Internal Glazing *Y/N* ☑
Window Covering *RS - Roller Shade*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
003	Base Cabinet Open w/ Adjustable Shelves	1	Yes	CSCI
	Note: With counter, Type-1, provided instead of tall cabinet			
021	General Work Surface	1	Yes	CSCI
039	Tall Storage Cabinet w/ Lockable Doors and Whiteboard	1	Yes	CSCI
	Note: Type-2, provided instead of upper cabinets & Lower Cabinets. Total millwork width: 1200 mm			
052	Wall Hung Upper Cabinet open w/ Shelves	1	Yes	CSCI
	Note: 50% uppers open, Type-1, provided instead of tall cabinet			
058	Wall Hung Upper Cabinet Lockable w/ Double Doors & Shelves	1	Yes	CSCI
	Note: 50% uppers lockable, Type-1, provided instead of tall cabinet			

12

Building Engineering & Operations

Department:	**12 - Building Engineering & Operations**
Minimum Area:	**80.00**
Ceiling Height:	**3050.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Locate near to elevator

Design Features

- Accommodate metal racking / shelving
- Open area for storing furniture

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Concrete, sealed (easy maintenance)*

Ceiling Finishes

Ceiling Characteristics	*Exposed*

Wall Finishes

Wall Characteristics	*Concrete*

Wall Protection

Types	*Plywood protection if walls are not concrete.*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

HVAC Requirements

HVAC

Minimum Temp (C)	*19*

Electrical Requirements

Power

Duplex Min. Qty	*4*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door*☑

Department: **12 - Building Engineering & Operations**

Minimum Area: **30.00** *Ceiling Height:* **3050.00**

Room Design Requirements

General Design Requirements

Design Features

- Metal shelving (No millwork required)
- Flammable storage cabinet
  - Stackable bin storage for items like nuts, bolts, nails, etc.
  - Ladder storage
  - Wall area for tool storage

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*- Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Concrete, sealed (easy maintenance)*

Ceiling Finishes

Ceiling Characteristics	*Exposed*

Wall Finishes

Wall Characteristics	*Concrete*

Wall Protection

Types	*Plywood protection if walls are not concrete.*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*19*

Electrical Requirements

Power

Duplex Min. Qty	*4*
Other Duplex Min. Qty	*6*

- (6) above counter for charging equipment/ drills

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door* ☑

Existing Equipment Unique

Custodial Storage
Room No. 12.002

BIM ID	Item Name	Qty	To be Modeled	Responsibility
1030	Buffer Machine	10	No	OSOI
1032	Filing Cabinet	2	No	OSOI

Loading/Shipping Receiving Room No. 12.003

Department:	**12 - Building Engineering & Operations**
Minimum Area:	**34.00**
Ceiling Height:	**3050.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- Temporary storage for incoming supplies, breakdown space etc.

Design Features

- Metal Shelving
- Laydown area

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Concrete, sealed (easy maintenance)*

Ceiling Finishes

Ceiling Characteristics	*Exposed (5' clearance beyond the overhead door)*

Equipment and Accessories

Sink Accessories

Soap Dispenser	☑
Paper Towel Dispenser	☑

Room Accessories

Whiteboard	☑ *(1) 1200 x 2400*
Tackboard	☑ *(1) 1200 x 2400*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Mop holder (CSCI)
2. Flammable Storage Cabinet - Lockable (CSCI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Janitorial	☑

Sink Mounting

Floor	☑

HVAC Requirements

HVAC

Minimum Temp (C)	*19*

Loading/Shipping Receiving Room No. 12.003

Electrical Requirements

Power

Duplex Min. Qty	*4*

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 2*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Overhead exterior door with view to outside (8' High)*
Other Doors *Man-door* ☑ *Other* ☑ *Overhead Exterior Door*

Department:	**12 - Building Engineering & Operations**
Minimum Area:	**8.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Direct visual access to lunchroom, temporary staging space, and loading/ shipping/receiving
- Visual access to exterior loading

Design Features

- -Laydown area

Occupancy

Capacity	*3*

Daylighting

☑ *Direct* ☐ *Indirect*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Vinyl*

Ceiling Finishes

Ceiling Characteristics	*ACT*

Wall Finishes

Wall Characteristics	*Painted GWB*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(1) 1200 x 2400*
Tackboard	☑ *(1) 1200 x 2400*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Workstation Desk (OSOI)
2. One (1) Office Chair (OSOI)
3. One (1) Computer Workstations (OSOI)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty *2*

Other Duplex Min. Qty

See General Power requirement above

Other

Clocks ☑

Communication Requirements

Communication Systems

Telephone ☑ *CAT6 Drop Min Qty: 1*

Data ☑ *CAT6 Drop Min Qty: 6*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 600mm wide*

Other Doors *Man-door* ☑

Windows

Exterior Window Required ☑ ☑ *Operable*

Internal Glazing *Y/N* ☑

Window Covering *RS - Roller Shade*

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
1043	Filing Cabinet	1	No	OSOI

Department:	**12 - Building Engineering & Operations**
Minimum Area:	**15.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions

- To accommodate approximately 10 staff members

Design Features

- Lunch seating

Occupancy

Capacity	*10*

Daylighting

☑ *Direct*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Vinyl*

Ceiling Finishes

Ceiling Characteristics	*ACT*

Wall Finishes

Wall Characteristics	*Painted GWB*

Equipment and Accessories

Room Accessories

Whiteboard	☑ *(1) 1200X2400*
Tackboard	☑ *(1) 1200x2400*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. One (1) Oven stove (OSOI)
2. One (1) Dishwasher (OSOI)
3. Ten (10) lockers half (stackable) (CSCI)
4. Lunch table for six (6) (OSOI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Double	☑

Sink Mounting

Counter	☑

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*Exhaust above microwave / toaster area sufficient to maintain room at negative pressure relative to adjacent areas. Local on/off switch with BMS control.*
Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power

- Provide power to items listed under Equipment & Accessories and Existing Equipment list as required

Duplex Min. Qty	*6*
Other Duplex Min. Qty	See General Power requirement above

Other

Clocks	☑

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 1*
Data	☑ *CAT6 Drop Min Qty: 4*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Remarks - *Minimum 915 mm - Wood doors - Sidelight 1.5m wide*
Other Doors *Man-door*☑

Windows

Exterior Window Required ☑ ☑ *Operable*
Window Covering Notes *RS- ROLLER SHADE*

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
004	Base Cabinet w/ Double Doors & Adjustable Shelves	1	Yes	CSCI
	Note: with P-Lam countertop			
055	Wall Hung Upper Cabinet w/ Double Doors & Shelves	1	Yes	CSCI

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
1036	Hot Plate	1	No	OSOI
1037	Microwave	1	No	OSOI
1038	Fridge	1	No	OSOI
1040	Toaster Oven	1	No	OSOI

Custodial Closet
Room No. 12.008

Department:	**12 - Building Engineering & Operations**
Minimum Area:	**0.00**
Ceiling Height:	**2750.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Minimum of one per floor
- Must be located centrally located on the floor.

Design Features

- Space for cart storage

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*- Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Sealed Concrete*

Ceiling Finishes

Ceiling Characteristics	*Exposed*

Wall Finishes

Wall Characteristics	*Wall to have protection 1200AFF*

Wall Protection

Types	*Plywood if the walls are not concrete 1200AFF FRP protect behind the mop sink regardless of wall material.*

Equipment and Accessories

Sink Accessories

Soap Dispenser	☑
Paper Towel Dispenser	☑
Paper Towel Waste	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Metal Shelf (CSCI)
2. Broom holders with shelf (CSCI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Fixtures

Floor Drain	☑

Sink Types

Janitorial	☑

Sink Mounting

Floor	☑

HVAC Requirements

HVAC

Exhaust	☑
Remarks	*Exhaust required for chemicals.*
Minimum Temp (C)	*19*

Electrical Requirements

Power

Duplex Min. Qty	*2*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door*	☑

Department:	**12 - Building Engineering & Operations**
Minimum Area:	**95.00**
Ceiling Height:	

Room Design Requirements

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*- Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Concrete, sealed (easy maintenance)*

Ceiling Finishes

Ceiling Characteristics	*Exposed*

Wall Finishes

Wall Characteristics	*Concrete*

Wall Protection

Types	*Plywood protection if walls are not concrete.*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

Plumbing Requirements

Sink Mounting

Wall ☑

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door* ☑

Department:	**12 - Building Engineering & Operations**
Minimum Area:	**30.00**
Ceiling Height:	

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

Electrical Requirements

Power

Duplex Min. Qty	*4*

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 2*

Lighting

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Department:	**12 - Building Engineering & Operations**
Minimum Area:	**29.00**
Ceiling Height:	

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

Electrical Requirements

Power

Duplex Min. Qty	*4*

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 2*

Lighting

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Department:	**12 - Building Engineering & Operations**
Minimum Area:	**13.00**
Ceiling Height:	

Room Finishes

Floor Finishes

Flooring Characteristics	*Sealed Concrete*

Ceiling Finishes

Ceiling Characteristics	*Exposed*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Handwash	☑ *Qty: 1*
Janitorial	☑ *Qty: 1*

Fixtures

Floor Drain	☑ *Qty: 1*

HVAC Requirements

HVAC

Minimum Temp (C)	*16*

Electrical Requirements

Power

Duplex Min. Qty	*4*

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 2*

Lighting

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Department:	**12 - Building Engineering & Operations**
Minimum Area:	**11.00**
Ceiling Height:	

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

Electrical Requirements

Power

Duplex Min. Qty	*4*

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 2*

Lighting

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

13
General Storage

General Bookroom - Level 1

Room No. 13.001

Department: **13 - General Storage**

Minimum Area: **40.00** *Ceiling Height:* **2750.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Locate on level 1

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Sealed concrete*

Ceiling Finishes

Ceiling Characteristics	*Exposed*

Wall Finishes

Wall Characteristics	*Painted GWB*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

Duplex Min. Qty	*2*

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 2*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door*☑

General Bookroom - Level 2
Room No. 13.002

Department: **13 - General Storage**

Minimum Area: **50.00** *Ceiling Height:* **2750.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Locate on level 2

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Sealed concrete*

Ceiling Finishes

Ceiling Characteristics	*Exposed*

Wall Finishes

Wall Characteristics	*Painted GWB*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

Duplex Min. Qty	*2*

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 2*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door*☑

General Bookroom - Level 3

Room No. 13.003

Department: **13 - General Storage**

Minimum Area: **50.00** *Ceiling Height:* **2750.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- Locate on level 3

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Sealed concrete*

Ceiling Finishes

Ceiling Characteristics	*Exposed*

Wall Finishes

Wall Characteristics	*Painted GWB*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

Duplex Min. Qty	*2*

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 2*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door*☑

Department: **13 - General Storage**

Minimum Area: **10.00** *Ceiling Height:* **2750.00**

Room Design Requirements

Daylighting

☑ *None*

Acoustics

Acoustic Requirements

Comments *Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics *Resilient*

Equipment and Accessories

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

HVAC Requirements

HVAC

Minimum Temp (C) *21*

Electrical Requirements

Power

Duplex Min. Qty *1*

Lighting

Luminaire Type

LED ☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door*☑

Millwork Schedule Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
004	Base Cabinet w/ Double Doors & Adjustable Shelves	1	Yes	CSCI
033	Tall Open Wall Shelving	1	Yes	CSCI
Note: For storing file boxes, paper, envelopes, binders, office supplies				
055	Wall Hung Upper Cabinet w/ Double Doors & Shelves	1	Yes	CSCI

Existing Equipment Unique

BIM ID	Item Name	Qty	To be Modeled	Responsibility
0189	Filing Cabinet #10	1	No	OSOI
0190	Metal Shelving Storage #1	1	No	OSOI
0191	Metal Shelving Storage #2	1	No	OSOI

14
Design Space

Last modified: **July 16 2019 06:05 PM**

Details

Typical Program Area: **4.50**
Description:
Notes:

Room Finishes

Floor Finishes

Flooring Characteristics	*Ceramic Tile*

Ceiling Finishes

Ceiling Characteristics	*GWB*

Wall Finishes

Wall Characteristics	*Ceramic Tile*

Equipment and Accessories

Sink Accessories

Soap Dispenser	☑
Air Dryer	☑

Room Accessories

Coat Hook	☑
Mirror	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Toilet Paper Dispenser-Dual (CSCI)
2. Sanitary Napkin Disposal (CSCI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Fixtures

WC	☑
Floor Drain	☑

Sink Types

Lavatory	☑

Sink Mounting

Counter	☑

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door* ☑

Templated Rooms:

Room Function No.	Room No.	Room Name	RDS Status	Program Area
12.010		Washroom-Gender Neutral	From RT.001	4.50
12.011		Washroom-Gender Neutral	From RT.001	4.50
14.01.005		Washroom-Gender Neutral	From RT.001	4.50
14.01.020		Washroom-Gender Neutral	From RT.001	4.50
14.01.021		Washroom-Gender Neutral	From RT.001	4.50
14.01.028		Washroom-Gender Neutral	From RT.001	4.50
14.01.039		Washroom-Gender Neutral	From RT.001	4.50
14.01.040		Washroom-Gender Neutral	From RT.001	4.50

Last modified: **October 22 2019 05:19 PM**

Details

Typical Program Area: **4.50**
Description:
Notes:

Room Finishes

Floor Finishes

Flooring Characteristics	*Ceramic Tile*

Ceiling Finishes

Ceiling Characteristics	*GWB*

Wall Finishes

Wall Characteristics	*Ceramic Tile*

Equipment and Accessories

Sink Accessories

Soap Dispenser	☑
Paper Towel Dispenser	☑
Paper Towel Waste	☑
Air Dryer	☑

Room Accessories

Coat Hook	☑
Mirror	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Toilet Paper Dispenser-Dual (CSCI)
2. Sanitary Napkin Disposal (CSCI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Lavatory	☑

Sink Mounting

Counter	☑

Fixtures

WC	☑
Floor Drain	☑

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1*
Other Duplex Min. Qty	*1*
	GFI receptacle beside sink

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door* ☑

Templated Rooms:

Room Function No.	Room No.	Room Name	RDS Status	Program Area
12.012		Washroom Staff-Female	From RT.002	4.50
14.01.015		Washroom Staff-Female	From RT.002	4.50
14.01.033		Washroom Staff-Female	From RT.002	4.50
14.01.034		Washroom Staff-Female	From RT.002	4.50

Last modified: **July 16 2019 05:53 PM**

Details

Typical Program Area: **4.50**
Description:
Notes:

Room Finishes

Floor Finishes

Flooring Characteristics	*Ceramic Tile*

Ceiling Finishes

Ceiling Characteristics	*GWB*

Wall Finishes

Wall Characteristics	*Ceramic Tile*

Equipment and Accessories

Sink Accessories

Soap Dispenser	☑
Paper Towel Dispenser	☑
Paper Towel Waste	☑
Air Dryer	☑

Room Accessories

Coat Hook	☑
Mirror	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Toilet Paper Dispenser-Dual (OSOI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Lavatory	☑

Sink Mounting

Counter	☑

Fixtures

WC	☑
Floor Drain	☑

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1*
Other Duplex Min. Qty	*1* GFI receptacle beside sink

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door* ☑

Templated Rooms:

Room Function No.	Room No.	Room Name	RDS Status	Program Area
14.01.029		Washroom Staff-Male	From RT.003	4.50
14.01.031		Washroom Staff-Male	From RT.003	4.50
14.01.032		Washroom Staff-Male	From RT.003	4.50

Last modified: **July 16 2019 06:03 PM**

Details

Typical Program Area:	**0.00**
Description:	**Area as per BCBC**
Notes:	

Room Finishes

Floor Finishes

Flooring Characteristics	*Ceramic Tile*

Ceiling Finishes

Ceiling Characteristics	*GWB*

Wall Finishes

Wall Characteristics	*Ceramic Tile*

Equipment and Accessories

Sink Accessories

Soap Dispenser	☑
Air Dryer	☑

Room Accessories

Coat Hook	☑
Mirror	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Toilet Paper Dispenser-Dual (CSCI)
2. Sanitary Napkin Disposal (CSCI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Lavatory	☑ *Qty: As per BCBC*

Sink Mounting

Counter	☑

Fixtures

WC	☑ *Qty: As per BCBC*
Floor Drain	☑

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door* ☑

Templated Rooms:

Room Function No.	Room No.	Room Name	RDS Status	Program Area
14.01.006		Washroom-Students-F	From RT.004	0.00
14.01.022		Washroom-Students-F	From RT.004	0.00
14.01.023		Washroom-Students-F	From RT.004	0.00
14.01.026		Washroom-Students-F	From RT.004	0.00
14.01.037		Washroom-Students-F	From RT.004	0.00
14.01.038		Washroom-Students-F	From RT.004	0.00

Last modified: **July 16 2019 06:03 PM**

Details

Typical Program Area: **0.00**
Description: **Area as per BCBC**
Notes:

Room Finishes

Floor Finishes

Flooring Characteristics	*Ceramic Tile*

Ceiling Finishes

Ceiling Characteristics	*GWB*

Wall Finishes

Wall Characteristics	*Ceramic Tile*

Equipment and Accessories

Sink Accessories

Soap Dispenser	☑
Air Dryer	☑

Room Accessories

Coat Hook	☑
Mirror	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Toilet Paper Dispenser-Dual (CSCI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Lavatory	☑ *Qty: As per BCBC*

Sink Mounting

Counter	☑

Fixtures

Urinal	☑ *Qty: As per BCBC*
WC	☑ *Qty: As per BCBC*
Floor Drain	☑

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1*

Lighting

Luminaire Type

LED	☑

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Room Design - Door & Window Requirements

Doorsets

Other Doors *Man-door* ☑

Templated Rooms:

Room Function No.	Room No.	Room Name	RDS Status	Program Area
14.01.007		Washroom-Students-M	From RT.005	0.00

Templated Rooms:

Room Function No.	Room No.	Room Name	RDS Status	Program Area
14.01.024		Washroom-Students-M	From RT.005	0.00
14.01.025		Washroom-Students-M	From RT.005	0.00
14.01.027		Washroom-Students-M	From RT.005	0.00
14.01.035		Washroom-Students-M	From RT.005	0.00
14.01.036		Washroom-Students-M	From RT.005	0.00

W/C Shower Staff Bike-Male
Room No. 14.01.016

Department: **14 - Design Space 01 - NIP**

Minimum Area: **8.00** *Ceiling Height:* **2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions
- Area: 8 sm

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Ceramic Tile*

Ceiling Finishes

Ceiling Characteristics	*GWB*

Wall Finishes

Wall Characteristics	*Ceramic Tile*

Equipment and Accessories

Sink Accessories

Soap Dispenser	☑
Paper Towel Dispenser	☑
Paper Towel Waste	☑

Room Accessories

Coat Hook	☑ *3*
Mirror	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Toilet Paper Dispenser-Dual (CSCI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Handwash	☑

Fixtures

WC	☑
Floor Drain	☑
Other	☑ *Shower*

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1*
Other Duplex Min. Qty	*1*
	GFI receptacle beside the sink

Lighting

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Department: **14 - Design Space 01 - NIP**

Minimum Area: **0.00** *Ceiling Height:* **2750.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

- locate near gym

Design Features

- provide a track for a future lift

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Tile*

Wall Finishes

Wall Characteristics	*Tile*

Equipment and Accessories

Sink Accessories

Soap Dispenser	☑
Paper Towel Dispenser	☑
Paper Towel Waste	☑
Air Dryer	☑

Room Accessories

Coat Hook	☑
Mirror	☑ *ADA Compliant, Framed*

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Toilet Paper Dispenser-Dual(CSCI)
2. Sanitary Napkin Disposal (CSCI)
3. Grab Bars (CSCI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Lavatory	☑

Sink Mounting

Wall	☑

Fixtures

Barrier Free WC	☑
Floor Drain	☑

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1*
Other Duplex Min. Qty	*2*

- GFI receptacle beside the sink
- Future ceiling lift

Lighting

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

W/C Shower Staff Bike-Female
Room No. 14.01.030

Department: **14 - Design Space 01 - NIP**

Minimum Area: **8.00** *Ceiling Height:* **2750.00**

Room Design Requirements

General Design Requirements

Activities and Functions
- Area: 8 sm

Acoustics

Acoustic Requirements

Comments	*Refer to Appendix 1C- Acoustic and Noise Control Ratings*

Room Finishes

Floor Finishes

Flooring Characteristics	*Ceramic Tile*

Ceiling Finishes

Ceiling Characteristics	*GWB*

Wall Finishes

Wall Characteristics	*Ceramic Tile*

Equipment and Accessories

Sink Accessories

Soap Dispenser	☑
Paper Towel Dispenser	☑
Paper Towel Waste	☑

Room Accessories

Coat Hook	☑ *(3)*
Mirror	☑

Furniture, Fixtures and Equipment

Refer to Existing Equipment and Appendix 1D - Furniture Fixtures and Equipment

1. Toilet Paper Dispenser-Dual (CSCI)
2. Sanitary Napkin Disposal (CSCI)

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Handwash	☑

Sink Mounting

Counter	☑

Fixtures

WC	☑
Floor Drain	☑
Other	☑ *Shower*

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1*
Other Duplex Min. Qty	*1*
	GFI receptacle beside the sink

Lighting

Lighting Control

As per VSB Electrical Standards / ASHRAE Requirements

Selection

Only used

BIM ID 001

Item Name	Base Cabinet Open for Mini-Fridge
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:40 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	001
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description	
	- Counter with open base cabinet for mini-fridge below counter
Size and Weight	
Height	915
Depth	620
Classifications	
Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Floor Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
05.008		PDC- PE	1	1

Note: Type 2- instead of tall cabinet.

Selection

Only used

BIM ID 002

Item Name	Base Cabinet Open for Recycling Bins
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:41 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	002
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description	
	- Open base cabinet for enclosure of recycling bins - Size and number of recycling bins to be confirmed - With countertop for microwave above
Size and Weight	
Height	915
Depth	620
Classifications	
Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Floor Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
03.001		School Commons	1	1

Selection

Only used

BIM ID 003

Item Name	Base Cabinet Open w/ Adjustable Shelves
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:41 PM

Connections		**Other**	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	003
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- For length refer to Room Data Sheet
- Minimum 1 adjustable shelf

Size and Weight

Height	915
Depth	620

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Floor Mounted	☑

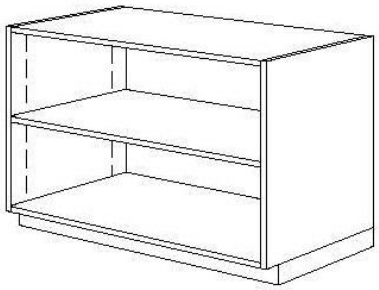
Room Function Number:	Room Number	Room Name	Priority	Gross
02.009		Technology Support Office	1	1
Note: With countertop				
02.018		PDC-Counselling	1	1
Note: With counter, Type-1, provided instead of tall cabinet				
02.019		International Education	1	1
02.030		Career Prep Office	1	1
Note: With countertop				
04.01.004		Ceramic Studio, Equipment & Storage	1	1
Note: - With wood countertop - Along one wall				
04.01.006		Graphic Arts & Photography Lab	1	1
Note: With countertop 50% of total				
04.01.008		PDC-Arts	1	1
Note: With counter, Type-1, provided instead of tall cabinet				
04.04.004		Music Storage	1	1
06.001		Classroom, 1	1	1
Note: with countertop, 50% of room perimeter				
06.002		Classroom, 2	1	1
Note: with countertop, 50% of room perimeter				
06.003		Classroom, 3	1	1
Note: with countertop, 50% of room perimeter				
06.004		Classroom, 4	1	1
Note: with countertop, 50% of room perimeter				
06.005		Classroom, 5	1	1
Note: with countertop, 50% of room perimeter				

BIM ID 003

Room Function Number:	Room Number	Room Name	Priority	Gross
06.006		Classroom, 6	1	1
Note: with countertop, 50% of room perimeter				
06.007		Classroom, 7	1	1
Note: with countertop, 50% of room perimeter				
06.008		Classroom, 8	1	1
Note: with countertop, 50% of room perimeter				
06.009		Classroom, 9	1	1
Note: with countertop, 50% of room perimeter				
06.010		Classroom, 10	1	1
Note: with countertop, 50% of room perimeter				
06.011		Classroom, 11	1	1
Note: with countertop, 50% of room perimeter				
06.012		Classroom, 12	1	1
Note: with countertop, 50% of room perimeter				
06.013		Classroom, 13	1	1
Note: with countertop, 50% of room perimeter				
06.014		Classroom, 14	1	1
Note: with countertop, 50% of room perimeter				
06.015		Classroom, 15	1	1
Note: with countertop, 50% of room perimeter				
06.016		Classroom, 16	1	1
Note: with countertop, 50% of room perimeter				
06.017		Classroom, 17	1	1
Note: with countertop, 50% of room perimeter				
06.018		Classroom, 18	1	1
Note: with countertop, 50% of room perimeter				
06.019		Classroom, 19	1	1
Note: with countertop, 50% of room perimeter				
06.020		Classroom, 20	1	1
Note: with countertop, 50% of room perimeter				
06.021		Classroom, 21	1	1
Note: with countertop, 50% of room perimeter				
06.022		Classroom, 22	1	1
Note: with countertop, 50% of room perimeter				
06.023		Classroom, 23	1	1
Note: with countertop, 50% of room perimeter				
06.024		Classroom, 24	1	1
Note: with countertop, 50% of room perimeter				
06.025		Classroom, 25	1	1
Note: with countertop, 50% of room perimeter				
06.026		Classroom, 26	1	1
Note: with countertop, 50% of room perimeter				
06.027		Classroom, 27	1	1
Note: with countertop, 50% of room perimeter				
06.028		Classroom, 28	1	1
Note: with countertop, 50% of room perimeter				
06.029		Classroom, 29	1	1
Note: with countertop, 50% of room perimeter				
06.030		Classroom, 30	1	1
Note: with countertop, 50% of room perimeter				
06.031		Classroom, 31	1	1
Note: with countertop, 50% of room perimeter				
06.032		Classroom, 32	1	1

Room Function Number:	Room Number	Room Name	Priority	Gross
Note: with countertop, 50% of room perimeter				
06.033		Classroom, 33	1	1
Note: with countertop, 50% of room perimeter				
06.034		Classroom, 34	1	1
Note: with countertop, 50% of room perimeter				
06.035		Classroom, 35	1	1
Note: with countertop, 50% of room perimeter				
06.036		Classroom, 36	1	1
Note: with countertop, 50% of room perimeter				
06.037		Classroom, 37	1	1
Note: with countertop, 50% of room perimeter				
06.039		PDC - English	1	1
Note: With countertop, Type 1- provided instead of tall cabinet.				
06.041		PDC - ELL	1	1
Note: With countertop, Type 1- provided instead of tall cabinet				
06.043		PDC - Math	1	1
Note: With countertop, Type 1- provided instead of tall cabinet.				
06.045		PDC - Social Studies	1	1
Note: With countertop, Type 1- provided instead of tall cabinet.				
06.047		PDC - Languages	1	1
Note: With countertop, Type 1- provided instead of tall cabinet.				
07.003		Storage and Prep-Chemistry	1	1
Note: 760 mm deep. 500 mm long with drawers, remainder open shelving. Acid resistant countertop.				
07.006		Physics Lab	1	1
Note: TBC by science staff				
07.014		PDC-Science	1	1
Note: With counter, Type-1, provided instead of tall cabinet				
08.007		PDC-Industrial	1	1
Note: With counter, Type-1, provided instead of tall cabinet				
10.001		PC Lab	1	1
Note: - 80% of shelving to be lockable, 20 % open, along window wall				
10.003		MAC Lab	1	1
Note: - 100% of shelving to be lockable				
10.004		PDC-Business Ed	1	1
Note: With counter, Type-1, provided instead of tall cabinet				
10.007		Math Programming Lab	1	1
Note: 66% of window cabinets away from teaching wall to be open shelving under windows				
10.008		Computer Lab	1	1
Note: 50% lockable				
10.008		Computer Lab	1	1
11.02.001		Classroom-LS	1	1
11.02.004		WC-Shower-LS	1	1
Note: For storage of personal items for up to 8 students				
11.02.005		Washroom-LS	1	1
Note: For storage of personal items for up to 8 students				
11.04.003		PDC-LAC	1	1
Note: With counter, Type-1, provided instead of tall cabinet				

BIM ID 003



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Selection

Only used

BIM ID 004

Item Name	Base Cabinet w/ Double Doors & Adjustable Shelves
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:41 PM

Connections

Budget	CSCI
Responsibility	IARC
Tender Group	

Other

ASE	No
BIM ID	004
To be modeled	Yes
Reference	Generic Parent
Price Comment	

Summary

Description

- For length refer to Room Data Sheet
- Minimum 1 adjustable shelf
- Provide doors with laminate finish

Size and Weight

Height	915
Depth	620

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Floor Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
02.007		First Aid Room	1	1
Note: All millwork along one wall only				
02.010		Copy/ Prep/Print Room	1	1
Note: with countertop				
02.013		Staff Room	1	1
04.03.002		Change Room	1	1
Note: With countertop				
04.03.003		Green Room & Drama Storage A	1	1
Note: With countertop				
04.04.001		Music Room (Band)	1	1
Note: With countertop, located at work counter for instrument repair, 2' x 10'				
04.04.002		Music Room (Strings)	1	1
Note: With countertop, located at work counter for instrument repair, 2' x 10'				
07.001		Chemistry Lab, 1	1	1
Note: with countertop, acid resistant, only at sink locations				
07.002		Chemistry Lab, 2	1	1
Note: with countertop, acid resistant, only at sink locations				
07.004		Universal Science Lab, 7 (Biology)	1	1
Note: with countertop, acid resistant, only at sink locations				
07.008		Universal Science Lab, 1	1	1
Note: with countertop, acid resistant, only at sink locations				
07.009		Universal Science Lab, 2	1	1
Note: with countertop, acid resistant, only at sink locations				

BIM ID 004

Room Function Number:	Room Number	Room Name	Priority	Gross
07.010		Universal Science Lab, 3	1	1
Note: with countertop, acid resistant, only at sink locations				
07.011		Universal Science Lab, 4	1	1
Note: with countertop, acid resistant, only at sink locations				
07.012		Universal Science Lab, 5	1	1
Note: with countertop, acid resistant, only at sink locations				
07.013		Universal Science Lab, 6	1	1
Note: with countertop, acid resistant, only at sink locations				
11.02.001		Classroom-LS	1	1
11.03.003		Classroom - LALS	1	1
Note: with countertop, near to washer/ dryer. Drawers to be lockable				
11.04.002		Classroom - Jr LAC	1	1
Note: At perimeter, 50%				
12.007		Lunch Room	1	1
Note: with P-Lam countertop				
13.004		Admin Archive Storage	1	1

Selection

Only used

BIM ID 005

Item Name	Base Cabinet w/ Lockable Double Doors & Adjustable Shelves
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:41 PM

Connections		**Other**	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	005
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- For length refer to Room Data Sheet
- Minimum 1 adjustable shelf
- Provide doors with laminate finish, lockable

Size and Weight

Height	915
Depth	620

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Floor Mounted	☑

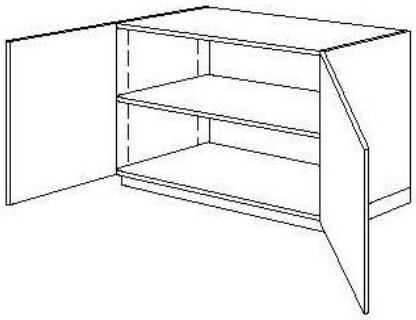
Room Function Number:	Room Number	Room Name	Priority	Gross
02.019		International Education	1	1
Note: with countertop, 50% storage lockable				
04.01.001		Art Studio, 2	1	1
Note: with countertop, located at room perimeter below windows				
04.01.002		Art Studio, 1	1	1
Note: with countertop, located at room perimeter below windows				
04.01.006		Graphic Arts & Photography Lab	1	1
Note: With countertop 50% of total				
04.04.001		Music Room (Band)	1	1
Note: With countertop				
04.04.002		Music Room (Strings)	1	1
Note: With countertop				
05.010		Storage Closet Uniform/Concession	1	1
06.001		Classroom, 1	1	1
Note: with countertop, 50% of room perimeter				
06.002		Classroom, 2	1	1
Note: with countertop, 50% of room perimeter				
06.003		Classroom, 3	1	1
Note: with countertop, 50% of room perimeter				
06.004		Classroom, 4	1	1
Note: with countertop, 50% of room perimeter				
06.005		Classroom, 5	1	1
Note: with countertop, 50% of room perimeter				

BIM ID 005

Room Function Number:	Room Number	Room Name	Priority	Gross
06.006		Classroom, 6	1	1
Note: with countertop, 50% of room perimeter				
06.007		Classroom, 7	1	1
Note: with countertop, 50% of room perimeter				
06.008		Classroom, 8	1	1
Note: with countertop, 50% of room perimeter				
06.009		Classroom, 9	1	1
Note: with countertop, 50% of room perimeter				
06.010		Classroom, 10	1	1
Note: with countertop, 50% of room perimeter				
06.011		Classroom, 11	1	1
Note: with countertop, 50% of room perimeter				
06.012		Classroom, 12	1	1
Note: with countertop, 50% of room perimeter				
06.013		Classroom, 13	1	1
Note: with countertop, 50% of room perimeter				
06.014		Classroom, 14	1	1
Note: with countertop, 50% of room perimeter				
06.015		Classroom, 15	1	1
Note: with countertop, 50% of room perimeter				
06.016		Classroom, 16	1	1
Note: with countertop, 50% of room perimeter				
06.017		Classroom, 17	1	1
Note: with countertop, 50% of room perimeter				
06.018		Classroom, 18	1	1
Note: with countertop, 50% of room perimeter				
06.019		Classroom, 19	1	1
Note: with countertop, 50% of room perimeter				
06.020		Classroom, 20	1	1
Note: with countertop, 50% of room perimeter				
06.021		Classroom, 21	1	1
Note: with countertop, 50% of room perimeter				
06.022		Classroom, 22	1	1
Note: with countertop, 50% of room perimeter				
06.023		Classroom, 23	1	1
Note: with countertop, 50% of room perimeter				
06.024		Classroom, 24	1	1
Note: with countertop, 50% of room perimeter				
06.025		Classroom, 25	1	1
Note: with countertop, 50% of room perimeter				
06.026		Classroom, 26	1	1
Note: with countertop, 50% of room perimeter				
06.027		Classroom, 27	1	1
Note: with countertop, 50% of room perimeter				
06.028		Classroom, 28	1	1
Note: with countertop, 50% of room perimeter				
06.029		Classroom, 29	1	1
Note: with countertop, 50% of room perimeter				
06.030		Classroom, 30	1	1
Note: with countertop, 50% of room perimeter				
06.031		Classroom, 31	1	1
Note: with countertop, 50% of room perimeter				
06.032		Classroom, 32	1	1

Room Function Number:	Room Number	Room Name	Priority	Gross
Note: with countertop, 50% of room perimeter				
06.033		Classroom, 33	1	1
Note: with countertop, 50% of room perimeter				
06.034		Classroom, 34	1	1
Note: with countertop, 50% of room perimeter				
06.035		Classroom, 35	1	1
Note: with countertop, 50% of room perimeter				
06.036		Classroom, 36	1	1
Note: with countertop, 50% of room perimeter				
06.037		Classroom, 37	1	1
Note: with countertop, 50% of room perimeter				
06.038		Yearbook	1	1
Note: With countertop. Furniture system alternate allowed.				
07.001		Chemistry Lab, 1	1	1
Note: with countertop, acid resistant, all lockable except where sink in counter above, run length of exterior wall				
07.002		Chemistry Lab, 2	1	1
Note: with countertop, acid resistant, all lockable except where sink in counter above, run length of exterior wall				
07.004		Universal Science Lab, 7 (Biology)	1	1
Note: with countertop, acid resistant, all lockable except where sink in counter above, run length of exterior wall				
07.006		Physics Lab	1	1
Note: TBC by science staff				
07.008		Universal Science Lab, 1	1	1
Note: with countertop, acid resistant, all lockable except where sink in counter above, run length of exterior wall				
07.009		Universal Science Lab, 2	1	1
Note: with countertop, acid resistant, all lockable except where sink in counter above, run length of exterior wall				
07.010		Universal Science Lab, 3	1	1
Note: with countertop, acid resistant, all lockable except where sink in counter above, run length of exterior wall				
07.011		Universal Science Lab, 4	1	1
Note: with countertop, acid resistant, all lockable except where sink in counter above, run length of exterior wall				
07.012		Universal Science Lab, 5	1	1
Note: with countertop, acid resistant, all lockable except where sink in counter above, run length of exterior wall				
07.013		Universal Science Lab, 6	1	1
Note: with countertop, acid resistant, all lockable except where sink in counter above, run length of exterior wall				
09.003		Textiles Lab	1	1
Note: with countertop, along 2 walls, space for 10 serger machines				
10.001		PC Lab	1	1
Note: - 80% of shelving to be lockable, 20 % open, along window wall				
10.002		Business Education Classroom	1	1
Note: 100% lockable, along the door wall, recessed in the wall				
10.003		MAC Lab	1	1
Note: - 100% of shelving to be lockable				
10.007		Math Programming Lab	1	1
Note: 33% of window wall cabinets to be lockable near teaching wall.				
11.01.001		Classroom- LSP	1	1
11.04.001		Classroom - Sr LAC	1	1
Note: At room perimeter				
11.04.002		Classroom - Jr LAC	1	1
Note: At perimeter, 50%				

BIM ID 005



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Selection

Only used

BIM ID 006

Item Name	Base Cabinet w/ Sliding Doors & Adjustable Shelves
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:41 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	006
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- Length to suit room
- Minimum two (2) adjustable shelf
- Provide sliding doors with laminate finish

Size and Weight

Height	915
Depth	620

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Floor Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
10.005		School Store	1	1

Selection

Only used

BIM ID 007

Item Name	Base Cabinet w/ Drawers
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:41 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	007
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- Number of drawers to be confirmed
- No furniture system alternate allowed

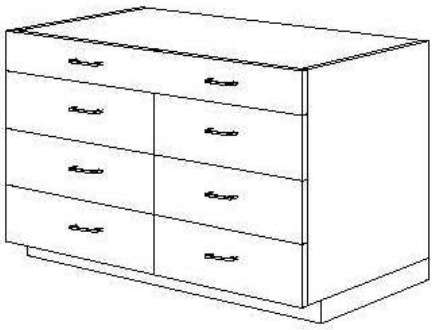
Size and Weight

Height	915
Depth	760

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Floor Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
07.003		Storage and Prep-Chemistry	1	1
Note: With countertop, Allow for wall space for solvent cabinet, acid cabinet & fridge. 500 mm long with drawers, remainder open shelving. Acid resistant countertop.				
09.001		Food Room, 1	1	1
Note: Bank of 4 drawers next to the stove per unit Bank of 2 deep drawers unit				
09.002		Food Room, 2	1	1
Note: Bank of 4 drawers next to the stove per unit Bank of 2 deep drawers unit				



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Selection

Only used

BIM ID 008

Item Name	Base Cabinet w/ Drawers and Double Door Cabinet
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:41 PM

Connections		**Other**	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	008
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- Provide 1 row of drawers
- Provide 1 set of cabinet doors below drawers
- No furniture system alternate allowed

Size and Weight

Height	915
Depth	620

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Floor Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
01.002		Maker Creative Space	1	1
Note: With countertop; provided along 1 side of room, entire room length				
01.005		Librarian Work Space / Cataloguing Office	1	1
Note: With countertop. One bank of drawer of various size drawers. 2/3 of the room perimeter.				
09.001		Food Room, 1	1	1
Note: With countertop. Shelving to be heavy duty to hold heavy kitchen equipment				
09.002		Food Room, 2	1	1
Note: With countertop. Shelving to be heavy duty to hold heavy kitchen equipment				

Selection

Only used

BIM ID 009

Item Name	Base Cabinet, Glazed, w/ Solid Counter, Lockable Sliding Glass Doors
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:41 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	009
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description	
	- Solid counter & solid top to conceal cash drawers - Open storage space for cash drawers, accessible from inside - Glass display case below with pull-out shelving - No furniture system alternate allowed - Lighting to accent merchandise
Size and Weight	
Height	915
Depth	620
Classifications	
Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Floor Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
10.005		School Store	1	1

Selection

Only used

BIM ID 010

Item Name	Bookcase Low Height Cabinet w/ Open Shelving
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:41 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	010
Tender Group		To be modeled	Yes
		Reference	
		Price Comment	

Summary

Description

- 1 shelf
- Provide backing
- Top of bookcase to act as seating
- No systems furniture alternate allowed

Size and Weight

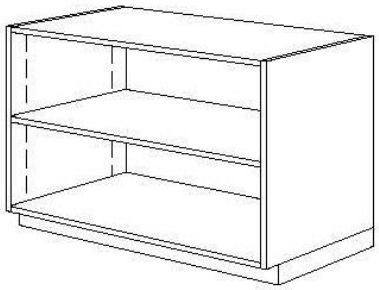
Height	500
Depth	330

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
01.015		Non-Fiction Collection	1	1

Note: Approx. xx linear metres of collections. Ensure stacks are not too high for ease of supervision



Selection

Only used

BIM ID 011

Item Name	Bookcase Medium Height Cabinet w/ Open Shelving
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:41 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	011
Tender Group		To be modeled	Yes
		Reference	
		Price Comment	

Summary

Description

- Minimum 3 adjustable shelves
- Provide backing
- No systems furniture alternate allowed

Size and Weight

Height	1,040
Depth	330

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
01.001		Teacher Librarian Centre Desk	1	1
Note: 2/3 of total				
01.014		Fiction Collection	1	1
Note: Approx. 620 metres total of stacks for collections (320 metres fixed along walls, 300 metres not along perimeters & movable). Ensure stacks are not high for ease of supervision if located in the middle of space				
01.015		Non-Fiction Collection	1	1

Selection

Only used

BIM ID 012

Item Name	Bookcase Medium Height Cabinet w/ Open Shelving Movable
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:41 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	012
Tender Group		To be modeled	Yes
		Reference	
		Price Comment	

Summary

Description

- Minimum 3 adjustable shelves
- Provide backing
- Movable
- No systems furniture alternate allowed

Size and Weight

Height	1,040
Depth	330

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
01.014		Fiction Collection	1	1
Note: 250mm D, provide back stop 100mm high. 5 adjustable shelving. Approx. 620 metres total of stacks for collections (320 metres fixed along walls, 300 metres not along perimeters & movable). Ensure stacks are not high for ease of supervision if located in the middle of space				
01.015		Non-Fiction Collection	1	1

Selection

Only used

BIM ID 013

Item Name	Bookcase Tall Cabinet w/ Open Shelving
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:41 PM

Connections		**Other**	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	013
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description	
	- Height to top of door frame - Minimum 5 adjustable shelves - Provide backing - No systems furniture alternate allowed
Size and Weight	
Depth	330
Classifications	
Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
01.001		Teacher Librarian Centre Desk	1	1
Note: 1/3 of total				
01.014		Fiction Collection	1	1
Note: Approx. 620 metres total of stacks for collections (320 metres fixed along walls, 300 metres not along perimeters & movable). Ensure stacks are not high for ease of supervision if located in the middle of space				
11.03.003		Classroom - LALS	1	1

602
607 w/o Back

Selection

Only used

BIM ID 014

Item Name	Brochure Display
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:41 PM

Connections		**Other**	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	014
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- Provide minimum 4 rows for display of brochures
- Furniture system alternate allowed, must be heavy duty

Size and Weight

Length/Width	890

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Floor Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
02.017		Waiting Area - Counselling and International Education	1	1

Selection

Only used

BIM ID 015

Item Name	Computer Work Surface
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:41 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	015
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- For length refer to Room Data Sheet
- Provide grommets as required for each work station
- Provide CPU holders below work surface as required for each work station
- Furniture system alternate allowed

Size and Weight

Height	760
Depth	620

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
04.03.005		Sound/Lighting Booth	1	1
Note: ADA accessible				
08.002		Electronics/Robotics	1	1
08.004		Drafting Room/Maker Space	1	1
10.001		PC Lab	1	1
Note: At perimeter of room				
10.003		MAC Lab	1	1
Note: At perimeter of room				
10.008		Computer Lab	1	1
11.01.001		Classroom- LSP	1	1
Note: Note: System furniture for 12 computers. Half in quite zone and half in loud zone if furniture system is provided for the workstation make ensure no running wires are on the floor creating tripping hazard.				
11.04.001		Classroom - Sr LAC	1	1
11.04.002		Classroom - Jr LAC	1	1

Selection

Only used

BIM ID 016

Item Name	Counter w/ Lockers Below
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:41 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	016
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description	
	- Counter with 1/2 height lockers below
Size and Weight	
Height	915
Depth	620
Classifications	
Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Floor Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
05.008		PDC- PE	1	1

Selection

Only used

BIM ID 017

Item Name	Counter, no base cabinet
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:41 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	017
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description	
	- For length refer to Room Data Sheet - Furniture system alternate not allowed
Size and Weight	
Height	915
Depth	620
Classifications	
Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
05.006		Locker Room, Female	1	1
05.007		Locker Room, Male	1	1
05.009		Staff Shower/WC	1	1
10.005		School Store	1	1

Selection

Only used

BIM ID 018

Item Name	Deep Open Storage, Instruments (TBD)
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:41 PM

Connections		**Other**	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	018
Tender Group		To be modeled	Yes
		Reference	
		Price Comment	

Summary

Description

- TBD
- Systems furniture alternate allowed

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
04.04.002		Music Room (Strings)	1	40

Note: For 40 violins, minimum 600 mm wide compartments

Selection

Only used

BIM ID 019

Item Name	Deep Open Storage, Physical Education (TBD)
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	019
Tender Group		To be modeled	Yes
		Reference	
		Price Comment	

Summary

Description

- TBD
- Systems furniture alternate allowed

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
04.04.004		Music Storage	1	1
05.004		PE Storage, 1	1	1

Selection

Only used

BIM ID 020

Item Name	Work Surface w/ Cubicles
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		**Other**	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	020
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- 900mm deep
- 900mm high baffle on each side
- Drawer for storing photo paper light tight
- Rest of the area under drawer to be open storage shelving
- Materials must be corrosion resistant for use of darkroom chemicals
- Counter should have a lip to prevent drips of chemicals

Size and Weight

Height	915
Depth	900
Length/Width	1,000

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
04.01.007		Darkroom	1	15

Note: 15 stations, to hold 15 enlargers

Selection

Only used

BIM ID 021

Item Name	General Work Surface
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		**Other**	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	021
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- For length refer to Room Data Sheet
- Furniture system alternate allowed

Size and Weight

Height	760
Depth	620

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
01.005		Librarian Work Space / Cataloguing Office	1	1
Note: 1/3 of the room perimeter				
02.007		First Aid Room	1	1
Note: All millwork along one wall only				
02.016		Conference Room	1	1
02.018		PDC-Counselling	1	1
04.01.008		PDC-Arts	1	1
04.02.002		Dance Studio Storage	1	1
04.03.002		Change Room	1	1
Note: At the mirror, no furniture alternates allowed				
07.014		PDC-Science	1	1
08.005		Storage-Electronic	1	1
08.006		Finishes Room	1	1
08.007		PDC-Industrial	1	1
10.004		PDC-Business Ed	1	1
11.04.003		PDC-LAC	1	1

Selection

Only used

BIM ID 022

Item Name	Lab Counter (TBD)
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	022
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- For length refer to Room Data Sheet
- ADA Compliant
- No furniture system alternate allowed
- TBD

Size and Weight

Depth	620

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
07.001		Chemistry Lab, 1	1	1
07.002		Chemistry Lab, 2	1	1
07.004		Universal Science Lab, 7 (Biology)	1	1
07.008		Universal Science Lab, 1	1	1
07.009		Universal Science Lab, 2	1	1
07.010		Universal Science Lab, 3	1	1
07.011		Universal Science Lab, 4	1	1
07.012		Universal Science Lab, 5	1	1
07.013		Universal Science Lab, 6	1	1

Selection

Only used

BIM ID 023

Item Name	Lab Counter-Teacher Demo Station
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	023
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description	
	- Length TBD - ADA Compliant - No furniture system alternate allowed - With single sink, 3x duplex outlets, 1x Natural gas outlets
Size and Weight	
Height	915
Depth	620
Classifications	
Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
07.006		Physics Lab	1	1

Selection

Only used

BIM ID 024

Item Name	Librarian Circulation Desk
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	024
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- Circular millwork, 14 SM areas with a 2.6 m void in middle for staff & students
- Millwork must allow for 360 degree visibility
- Millwork to provide: lockable drop box, work surface for 2 staff, storage for 2 book carts under counter
- Bar height for drop box and working counter to accommodate 2 staff
- Barrier free and accessibility must be considered for a portion of millwork
- No systems furniture alternate allowed

Coordination Requirements

Electrical	☑

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Floor Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
01.001		Teacher Librarian Centre Desk	1	1

Selection

Only used

BIM ID 025

Item Name	Mobile Island w/ Storage
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	025
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description	
	- Mobile counter - Open adjustable shelves below - Length to be confirmed
Size and Weight	
Height	915
Depth	620
Classifications	
Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Floor Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
11.03.003		Classroom - LALS	1	1

Selection

Only used

BIM ID 026

Item Name	Mobile Shelving
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	026
Tender Group		To be modeled	Yes
		Reference	
		Price Comment	

Summary

Description	
	- Minimum 2 fixed shelves - Cart height - Movable - Systems furniture alternate allowed
Size and Weight	
Depth	500
Length/Width	1,000
Classifications	
Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
04.04.001		Music Room (Band)	1	1
04.04.002		Music Room (Strings)	1	1
04.04.004		Music Storage	1	1

Selection

Only used

BIM ID 027

Item Name	Mobile Shelving-Open w/ Adjustable Shelving
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	027
Tender Group		To be modeled	Yes
		Reference	
		Price Comment	

Summary

Description	
	- Minimum 2 adjustable shelves - On castors - Open, no doors - Can be substituted with furniture system
Size and Weight	
Height	915
Depth	610
Length/Width	1,219
Classifications	
Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
08.002		Electronics/Robotics	1	4
Note: 4 total in room				

Selection

Only used

BIM ID 028

Item Name	Reception Desk
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		**Other**	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	028
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- Bar height counter and working surface counter
- Barrier free and accessibility must be considered for a portion of millwork
- Provide lockable storage under work surface towards the ends
- Provide open shelving under work surface in the middle
- No systems furniture alternate allowed

Coordination Requirements

Electrical	☑

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Floor Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
02.029		Waiting & Reception Area	1	1

Note: Include barrier free accessible height counter area

Selection

Only used

BIM ID 029

Item Name	Tall Cabinet w/ Work Counter
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	029
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description	
	- Open Storage with adjustable shelves - Above counter height (915 mm - 2135), storage width of 320 mm, 3 adjustable shelves, metal rack - Below counter height (0 mm -915), storage width of 620 mm, 3 adjustable shelves - Plywood counter/ worksurface
Size and Weight	
Height	2,135
Depth	620
Classifications	
Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
08.003		Storage-Workshop, Wood	1	1
08.010		Storage-Workshop, Metal	1	1

Selection

Only used

BIM ID 030

Item Name	Tall Cabinet, Admin offices
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		**Other**	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	030
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- Full height cabinet
- Minimum 3 adjustable shelves, open for display (top half of cabinet)
- Sliding double doors with min. 3 adjustable shelves behind (bottom half of cabinet)
- No systems furniture alternate allowed

Size and Weight

Height	2,135
Depth	500

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Floor Mounted	☑
Ceiling Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
02.001		Principal Office	1	1
02.004		Open Office Workstations	1	1

Selection

Only used

BIM ID 031

Item Name	Tall Display Cabinet w/ Adjustable Shelves
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections

Budget	CSCI
Responsibility	IARC
Tender Group	

Other

ASE	No
BIM ID	031
To be modeled	Yes
Reference	Generic Parent
Price Comment	

Summary

Description

- For height and length refer to Functional Program
- Minimum 4 adjustable shelves
- Provide a minimum of 1 glass display door towards the public face, lockable.
- Casework must have lighting such that a top shelf will not block light to a bottom shelf within the display
- No systems furniture alternate allowed

Size and Weight

Depth	500

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Floor Mounted	☑
Ceiling Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
03.001		School Commons	1	1
09.003		Textiles Lab	1	1

Selection

Only used

BIM ID 032

Item Name	Tall Display Cabinet, no Shelves
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	032
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description	
	- For height and length refer to Functional Program - Minimum 4 adjustable shelves - Provide a minimum of 1 glass display door towards the public face, lockable. - Casework must have lighting such that a top shelf will not block light to a bottom shelf within the display - No systems furniture alternate allowed
Size and Weight	
Depth	500
Classifications	
Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Floor Mounted	☑
Ceiling Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
10.005		School Store	1	1
Note: For a mannequin display				

Selection

Only used

BIM ID 033

Item Name	Tall Open Wall Shelving
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		**Other**	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	033
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- For length refer to RDS
- Height to top of door frame
- Minimum 5 adjustable shelves
- Open wall shelving, no doors, no backing
- Capacity to hold books and heavy equipment
- Systems furniture alternate allowed

Size and Weight

Depth	330

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
02.009		Technology Support Office	1	1
02.010		Copy/ Prep/Print Room	1	1
Note: For storing file boxes, paper, envelopes, binders, office supplies				
02.030		Career Prep Office	1	1
08.004		Drafting Room/Maker Space	1	1
Note: Along one wall 1200 wide				
08.005		Storage-Electronic	1	1
08.006		Finishes Room	1	1
09.001		Food Room, 1	1	1
Note: Shelving to be heavy duty to hold heavy kitchen equipment				
09.002		Food Room, 2	1	1
Note: Shelving to be heavy duty to hold heavy kitchen equipment				
11.04.001		Classroom - Sr LAC	1	1
Note: At room perimeter				
11.04.002		Classroom - Jr LAC	1	1
Note: Along some wall perimeters				
13.004		Admin Archive Storage	1	1
Note: For storing file boxes, paper, envelopes, binders, office supplies				

Selection

Only used

BIM ID 034

Item Name	Tall Open Wall Shelving- Art Studio
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		**Other**	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	034
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description	
	- For storage of student work in progress - Height to top of door frame - Minimum 6 adjustable shelves - Open wall shelving, no doors, no backing - Capacity to hold heavy items - Systems furniture alternate allowed
Size and Weight	
Height	2,134
Depth	620
Length/Width	2,134
Classifications	
Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
04.01.001		Art Studio, 2	1	1
04.01.002		Art Studio, 1	1	1

Selection

Only used

BIM ID 035

Item Name	Tall Open Wall Shelving w/ Lip
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections

Budget	CSCI
Responsibility	IARC
Tender Group	

Other

ASE	No
BIM ID	035
To be modeled	Yes
Reference	Generic Parent
Price Comment	

Summary

Description

- For length refer to RDS
- Height to top of door frame
- Minimum 12 adjustable shelves
- Lip at each shelf to ensure no spills
- Open wall shelving, no doors, no backing
- Capacity to hold books and heavy equipment
- Systems furniture alternate allowed

Size and Weight

Depth	400

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
07.003		Storage and Prep-Chemistry	1	1
07.005		Storage-Biology/Physics	1	1
Note: provide space for fridge				
11.01.001		Classroom- LSP	1	1

Selection

Only used

BIM ID 036

Item Name	Tall Open Wall Shelving, Narrow-Art Studio
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	036
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description	
	- For storage of paper - Open wall shelving, no doors, no backing - Fixed shelves spaced every 254 mm (10") - Capacity to hold heavy items
Size and Weight	
Height	2,134
Depth	305
Length/Width	2,134
Classifications	
Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
04.01.003		Art Studio Storage	1	1

Selection

Only used

BIM ID 037

Item Name	Tall Storage Cabinet w/ 4 Doors and Adjustable Shelving & Door Shelving
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:41 PM

Connections		**Other**	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	037
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description	
	- 2 upper doors - 2 lower doors - 4 adjustable shelves - 4 adjustable shelves which are attached to back of doors
Size and Weight	
Height	2,135
Depth	620
Length/Width	1,220
Classifications	
Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
08.001		Wood Workshop	1	2
Note: 1220 wide, 2 in room				
08.008		Metalwork Workshop	1	2
Note: 1220 wide, 2 in room				

Selection

Only used

BIM ID 038

Item Name	Tall Storage Cabinet w/ Double Doors and Shelves
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		**Other**	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	038
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description	
	- Height to top of door frame - Minimum 5 adjustable shelves - Provide laminate finish - No systems furniture alternate allowed
Size and Weight	
Height	2,135
Depth	620
Length/Width	1,220
Classifications	
Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
09.001		Food Room, 1	1	1
Note: Shelving to be heavy duty to hold heavy kitchen equipment				
09.002		Food Room, 2	1	1
Note: Shelving to be heavy duty to hold heavy kitchen equipment				

Selection

Only used

BIM ID 039

Item Name	Tall Storage Cabinet w/ Lockable Doors and Whiteboard
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		**Other**	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	039
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- Height to top of door frame
- Minimum 6 adjustable shelves
- 2 sliding doors on top half of millwork with whiteboard finish
- Double doors with p-lam finish below
- Lockable
- No systems furniture alternate allowed

Size and Weight

Depth	620

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
02.018		PDC-Counselling	1	1
Note: Type-2, provided instead of upper cabinets & Lower Cabinets. Total millwork width: 1800 mm				
04.01.008		PDC-Arts	1	1
Note: Type-2, provided instead of upper cabinets & Lower Cabinets. Total millwork width: 1800 mm				
05.008		PDC- PE	1	1
Note: Type 1- Provide instead of Base cabinet & Upper cabinets. Total millwork width of 2400 mm.				
06.039		PDC - English	1	1
Note: Type 2- provided instead of lowers & uppers. Total millwork width: 1800 mm				
06.041		PDC - ELL	1	1
Note: Type 2- provided instead of lowers & uppers. Total millwork width: 1200 mm				
06.043		PDC - Math	1	1
Note: Type 2- provided instead of lowers & uppers. Total millwork width: 1800 mm				
06.045		PDC - Social Studies	1	1
Note: Type 2- provided instead of lowers & uppers. Total millwork width: 1800 mm				
06.047		PDC - Languages	1	1
Note: Type 2- provided instead of lowers & uppers. Total millwork width: 1800 mm				
07.014		PDC-Science	1	1
Note: Type-2, provided instead of upper cabinets & Lower Cabinets. Total millwork width: 1800 mm				
08.007		PDC-Industrial	1	1
Note: Type-2, provided instead of upper cabinets & Lower Cabinets. Total millwork width: 1200 mm				
10.004		PDC-Business Ed	1	1
Note: Type-2, provided instead of upper cabinets & Lower Cabinets. Total millwork width: 1800 mm				

BIM ID 039

Room Function Number:	Room Number	Room Name	Priority	Gross
11.04.003		PDC-LAC	1	1

Note: Type-2, provided instead of upper cabinets & Lower Cabinets. Total millwork width: 1200 mm

Selection

Only used

BIM ID 040

Item Name	Tall Storage Cabinet w/ Lockable Double Doors and Shelves
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		**Other**	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	040
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- Height to top of door frame
- Minimum 5 adjustable shelves
- Provide laminate finish
- Lockable double door
- No systems furniture alternate allowed

Size and Weight

Depth	620
Length/Width	1,220

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
04.01.001		Art Studio, 2	1	1
04.01.002		Art Studio, 1	1	1
04.03.004		Drama Storage B	1	1
04.03.005		Sound/Lighting Booth	1	1
Note: on opposite wall from computer work surface				
06.001		Classroom, 1	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.002		Classroom, 2	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.003		Classroom, 3	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.004		Classroom, 4	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.005		Classroom, 5	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.006		Classroom, 6	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.007		Classroom, 7	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.008		Classroom, 8	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.009		Classroom, 9	1	1

Room Function Number:	Room Number	Room Name	Priority	Gross
Note: On sidewall adjacent to corridor, for teacher storage				
06.010		Classroom, 10	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.011		Classroom, 11	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.012		Classroom, 12	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.013		Classroom, 13	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.014		Classroom, 14	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.015		Classroom, 15	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.016		Classroom, 16	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.017		Classroom, 17	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.018		Classroom, 18	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.019		Classroom, 19	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.020		Classroom, 20	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.021		Classroom, 21	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.022		Classroom, 22	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.023		Classroom, 23	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.024		Classroom, 24	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.025		Classroom, 25	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.026		Classroom, 26	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.027		Classroom, 27	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.028		Classroom, 28	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.029		Classroom, 29	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.030		Classroom, 30	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.031		Classroom, 31	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.032		Classroom, 32	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.033		Classroom, 33	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.034		Classroom, 34	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.035		Classroom, 35	1	1
Note: On sidewall adjacent to corridor, for teacher storage				

BIM ID 040

Room Function Number:	Room Number	Room Name	Priority	Gross
06.036		Classroom, 36	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
06.037		Classroom, 37	1	1
Note: On sidewall adjacent to corridor, for teacher storage				
09.004		Storage-Food	1	1
Note: Shelving to be heavy duty. Secure storage tall shelving along all the walls (Storage e.g. blenders, staff function dishes, baking pans, etc.); shared and located between 2 Food Labs; lockable Lengths of each cabinet unit to be confirmed with the user/client. To be around 3 sides of room.				
10.002		Business Education Classroom	1	1
Note: 100% lockable along the door wall, same as typical classroom. Provide charging outlets for 30 laptops				
11.02.001		Classroom-LS	1	1

Selection

Only used

BIM ID 041

Item Name	Tall Storage Cabinet w/ Lockable Drawers and Whiteboard
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	041
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- Height to top of door frame
- For width, refer to RDS
- Minimum 3 adjustable shelves
- 2 sliding doors on top half of millwork with whiteboard finish
- Full extension drawers on lower half
- Provide laminate finish
- Lockable
- No systems furniture alternate allowed

Size and Weight

Depth	620

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
07.001		Chemistry Lab, 1	1	1
07.002		Chemistry Lab, 2	1	1
07.004		Universal Science Lab, 7 (Biology)	1	1
07.008		Universal Science Lab, 1	1	1
07.009		Universal Science Lab, 2	1	1
07.010		Universal Science Lab, 3	1	1
07.011		Universal Science Lab, 4	1	1
07.012		Universal Science Lab, 5	1	1
07.013		Universal Science Lab, 6	1	1

Selection

Only used

BIM ID 042

Item Name	Tall Storage Cabinet w/ Lockable Drawers and Whiteboard, wide
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	042
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- Minimum 6 adjustable shelves
- Provide laminate finish
- Lockable
- No systems furniture alternate allowed
- Cabinet length: full perimeter of one wall
- Cabinet location in the room to be confirmed with the Owner.

Size and Weight

Height	2,135
Depth	800

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
04.04.001		Music Room (Band)	1	1
Note: full perimeter of one wall				
04.04.002		Music Room (Strings)	1	1
Note: full perimeter of one wall				

Selection

Only used

BIM ID 043

Item Name	Tall Storage Cabinet w/ 4 Doors and Adjustable Shelving
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:35 PM

Connections		**Other**	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	043
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description	
	- 2 upper doors - 2 lower doors - 4 adjustable shelves -
Size and Weight	
Height	2,135
Depth	620
Length/Width	1,220
Classifications	
Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
08.001		Wood Workshop	1	6
Note: 1220 wide, 6 in room				
08.008		Metalwork Workshop	1	2
Note: 1220 wide, 2 in room				

Selection

Only used

BIM ID 044

Item Name	Uniform Storage (TBD)
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	044
Tender Group		To be modeled	Yes
		Reference	
		Price Comment	

Summary

Description

- TBD
- Systems furniture alternate allowed

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
05.010		Storage Closet Uniform/Concession	1	1

Selection

Only used

BIM ID 045

Item Name	Vertical Storage for sheet material
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:41 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	045
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description	
	- Height to top of door frame - For storing sheet material
Size and Weight	
Depth	620
Length/Width	1,220
Classifications	
Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
08.001		Wood Workshop	1	1
08.008		Metalwork Workshop	1	1

Selection

Only used

BIM ID 046

Item Name	Wall Hung Cubbies
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections

Budget	CSCI
Responsibility	IARC
Tender Group	

Other

ASE	No
BIM ID	046
To be modeled	Yes
Reference	Generic Parent
Price Comment	

Summary

Description

- Open cubbies
- Dimensions TBC

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
11.02.001		Classroom-LS	1	10

Selection

Only used

BIM ID 047

Item Name	Wall Hung Cubbies, Lockable
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	047
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description	
	- Lockable cubbies with door - Height TBC
Size and Weight	
Depth	500
Length/Width	1,190
Classifications	
Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
09.003		Textiles Lab	1	140

Note: 140 cubbies minimum

Selection

Only used

BIM ID 048

Item Name	Wall Hung Mailbox
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	048
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- Height and length must be provided to accommodate mailboxes for XX staff
- Provide fixed horizontal and vertical shelves and dividers
- Each mailbox slot must be able to fit a 9"x12" document and have a minimum clear height of 125mm
- No furniture system alternate allowed

Size and Weight

Depth	305

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Wall Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
02.011		Mailboxes	1	1
Note: 140 cubbies				

Selection

Only used

BIM ID 049

Item Name	Wall Hung Pegboard
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		**Other**	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	049
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- Height, length, and depth to be confirmed
- Pegboard with solid backing
- For flexible storage of art equipment and supplies

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Wall Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
04.01.001		Art Studio, 2	1	1
04.01.002		Art Studio, 1	1	1

Selection

Only used

BIM ID 050

Item Name	Wall Hung Pegboard w/ Lockable Doors
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	050
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- Depth to be confirmed
- Pegboard with solid backing
- For flexible storage of art equipment and supplies
- Lockable doors on hinges that allow for securing of items stored on pegboard

Size and Weight

Height	1,200
Length/Width	2,400

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Wall Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
04.01.004		Ceramic Studio, Equipment & Storage	1	2

Note: - 2 units in room

Selection

Only used

BIM ID 051

Item Name	Wall Hung Recessed Cubbies
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	051
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description	
	- Open storage cubbies - Recessed into wall
Size and Weight	
Height	406
Depth	305
Length/Width	356
Classifications	
Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
04.02.001		Dance Studio	1	30

Selection

Only used

BIM ID 052

Item Name	Wall Hung Upper Cabinet open w/ Shelves
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	052
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- For length refer to Functional Program
- Minimum 1 adjustable shelf
- Provide lighting at bottom of upper cabinet
- Systems furniture alternate allowed

Size and Weight

Height	760
Depth	330

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Wall Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
01.005		Librarian Work Space / Cataloguing Office	1	1
02.009		Technology Support Office	1	1
02.018		PDC-Counselling	1	1
Note: 50% uppers open, Type-1, provided instead of tall cabinet				
02.030		Career Prep Office	1	1
04.01.004		Ceramic Studio, Equipment & Storage	1	1
Note: - Along one wall				
04.01.008		PDC-Arts	1	1
Note: 50% uppers open, Type-1, provided instead of tall cabinet				
06.038		Yearbook	1	1
Note: With lighting at underside of cabinets. Furniture system alternate allowed.				
06.039		PDC - English	1	1
Note: 50% of total, Type 1- provided instead of tall cabinet.				
06.041		PDC - ELL	1	1
Note: 50% of total, Type 1- provided instead of tall cabinet				
06.043		PDC - Math	1	1
Note: 50% of total, Type 1- provided instead of tall cabinet.				
06.045		PDC - Social Studies	1	1
Note: 50% of total, Type 1- provided instead of tall cabinet.				
06.047		PDC - Languages	1	1
Note: 50% of total, Type 1- provided instead of tall cabinet.				
07.014		PDC-Science	1	1

BIM ID 052

Room Function Number:	Room Number	Room Name	Priority	Gross
Note: 50% uppers open, Type-1, provided instead of tall cabinet				
08.007		PDC-Industrial	1	1
Note: 50% uppers open, Type-1, provided instead of tall cabinet				
10.004		PDC-Business Ed	1	1
Note: 50% uppers open, Type-1, provided instead of tall cabinet				
11.02.004		WC-Shower-LS	1	1
Note: For storage of personal items for up to 8 students				
11.02.005		Washroom-LS	1	1
Note: For storage of personal items for up to 8 students				
11.04.003		PDC-LAC	1	1
Note: 50% uppers open, Type-1, provided instead of tall cabinet				

Selection

Only used

BIM ID 053

Item Name	Wall Hung Upper Cabinet Open, 450 depth
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	053
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description	
	- Length to suit room - Minimum 4 adjustable shelves - shelves depth of 450 mm, start above counter
Size and Weight	
Height	2,135
Depth	450
Classifications	
Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Wall Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
10.005		School Store	1	1

Selection

Only used

BIM ID 054

Item Name	Wall Hung Upper Cabinet Open, 400 depth
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	054
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- For length refer to Functional Program
- Minimum 1 adjustable shelf
- Provide lighting at bottom of upper cabinet
- Systems furniture alternate allowed

Size and Weight

Height	760
Depth	400

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Wall Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
07.003		Storage and Prep-Chemistry	1	1

Note: Allow for wall space for solvent cabinet, acid cabinet & fridge.

Selection

Only used

BIM ID 055

Item Name	Wall Hung Upper Cabinet w/ Double Doors & Shelves
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		**Other**	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	055
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- For length refer to Functional Program
- Minimum 1 adjustable shelf
- Provide doors with laminate finish
- Provide lighting at bottom of upper cabinet
- Systems furniture alternate allowed

Size and Weight

Height	760
Depth	330

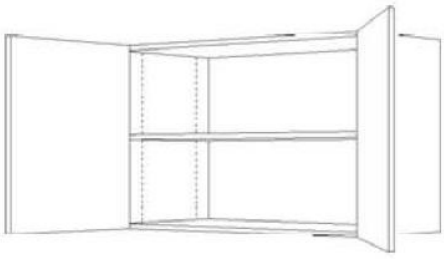
Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Wall Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
02.007		First Aid Room	1	1
Note: All millwork along one wall only				
02.013		Staff Room	1	1
04.03.003		Green Room & Drama Storage A	1	1
05.008		PDC- PE	1	1
Note: Along 1 wall. Type 2- instead of tall cabinet.				
09.001		Food Room, 1	1	1
Note: Shelving to be heavy duty to hold heavy kitchen equipment				
09.002		Food Room, 2	1	1
Note: Shelving to be heavy duty to hold heavy kitchen equipment				
09.003		Textiles Lab	1	1
Note: Above the sink, along 1 wall				
10.001		PC Lab	1	1
Note: - Upper storage along perimeter above computers (except @ window walls), underlit				
10.002		Business Education Classroom	1	1
Note: - 100% lockable upper storage along perimeter above computers along the back of the classroom, under-lit				
10.003		MAC Lab	1	1
Note: - Upper storage along perimeter above computers, underlit				
10.008		Computer Lab	1	1
11.02.001		Classroom-LS	1	1
11.03.003		Classroom - LALS	1	1

BIM ID 055

Room Function Number:	Room Number	Room Name	Priority	Gross
Note: Upper cabinet to have microwave space				
11.04.001		Classroom - Sr LAC	1	1
11.04.002		Classroom - Jr LAC	1	1
12.007		Lunch Room	1	1
13.004		Admin Archive Storage	1	1



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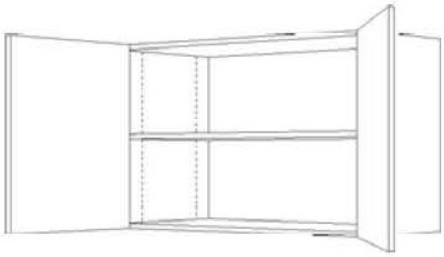


302

Selection

Only used

BIM ID 056

Item Name	Wall Hung Upper Cabinet w/ Double Glass Doors & Shelves
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		**Other**	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	056
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- For length refer to Functional Program
- Minimum 1 adjustable shelf
- Provide glass doors
- If counter below, install 530mm above counter
- No systems furniture alternate allowed

Size and Weight

Height	760
Depth	380

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Wall Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
07.001		Chemistry Lab, 1	1	1
07.002		Chemistry Lab, 2	1	1
07.004		Universal Science Lab, 7 (Biology)	1	1
07.006		Physics Lab	1	1
07.008		Universal Science Lab, 1	1	1
07.009		Universal Science Lab, 2	1	1
07.010		Universal Science Lab, 3	1	1
07.011		Universal Science Lab, 4	1	1
07.012		Universal Science Lab, 5	1	1
07.013		Universal Science Lab, 6	1	1

Selection

Only used

BIM ID 057

Item Name	Wall Hung Lockable Medicine Cabinet
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	057
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- For length refer to Functional Program
- Minimum 5 adjustable shelves
- Provide doors with laminate finish, lockable.
- Systems furniture alternate allowed

Size and Weight

Height	760
Depth	330

Classifications

Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Wall Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
02.007		First Aid Room	1	1

Note: All millwork along one wall only

Selection

Only used

BIM ID 058

Item Name	Wall Hung Upper Cabinet Lockable w/ Double Doors & Shelves
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:42 PM

Connections		Other	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	058
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description

- For length refer to Functional Program
- Minimum 1 adjustable shelf
- Provide doors with laminate finish, lockable.
- Provide lighting at bottom of upper cabinet
- Systems furniture alternate allowed

Size and Weight

Height	760
Depth	330

Classifications

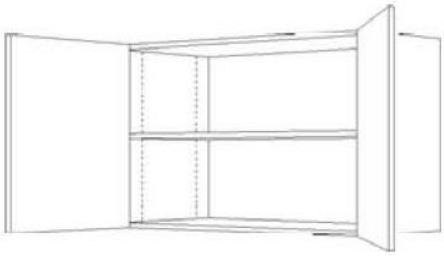
Masterformat Spec Reference	06 41 00 Architectural Wood Casework
Wall Mounted	☑

Room Function Number:	Room Number	Room Name	Priority	Gross
01.002		Maker Creative Space	1	1
02.018		PDC-Counselling	1	1
Note: 50% uppers lockable, Type-1, provided instead of tall cabinet				
04.01.008		PDC-Arts	1	1
Note: 50% uppers lockable, Type-1, provided instead of tall cabinet				
06.039		PDC - English	1	1
Note: 50% of total, Type 1- provided instead of tall cabinet.				
06.041		PDC - ELL	1	1
Note: 50% of total, Type 1- provided instead of tall cabinet				
06.043		PDC - Math	1	1
Note: 50% of total, Type 1- provided instead of tall cabinet.				
06.045		PDC - Social Studies	1	1
Note: 50% of total, Type 1- provided instead of tall cabinet.				
06.047		PDC - Languages	1	1
Note: 50% of total, Type 1- provided instead of tall cabinet.				
07.014		PDC-Science	1	1
Note: 50% uppers lockable, Type-1, provided instead of tall cabinet				
08.007		PDC-Industrial	1	1
Note: 50% uppers lockable, Type-1, provided instead of tall cabinet				
10.004		PDC-Business Ed	1	1
Note: 50% uppers lockable, Type-1, provided instead of tall cabinet				

BIM ID 058

Room Function Number:	Room Number	Room Name	Priority	Gross
11.04.003		PDC-LAC	1	1

Note: 50% uppers lockable, Type-1, provided instead of tall cabinet



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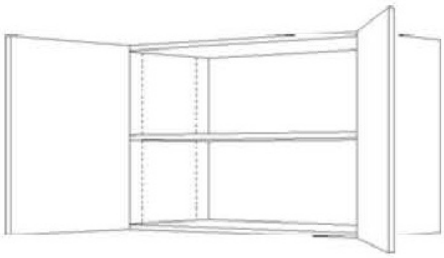

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Selection

Only used

BIM ID 059

Item Name	Workbench
Function Location:	06 - Wood, Plastics, Composites / 4000 - Architectural Woodwork & Casework
Last modified	Qureshi, Halima, 7/16/2019 5:41 PM

Connections		**Other**	
Budget	CSCI	ASE	No
Responsibility	IARC	BIM ID	059
Tender Group		To be modeled	Yes
		Reference	Generic Parent
		Price Comment	

Summary

Description	
	- For length refer to Room Data Sheet - Furniture system alternate not allowed
Size and Weight	
Height	760
Depth	620
Classifications	
Masterformat Spec Reference	06 41 00 Architectural Wood Casework

Room Function Number:	Room Number	Room Name	Priority	Gross
08.001		Wood Workshop	1	1
08.008		Metalwork Workshop	1	1

APPENDIX 1C

ACOUSTIC AND NOISE CONTROL RATINGS

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APPENDIX 1C

ACOUSTIC AND NOISE CONTROL RATINGS

This Appendix will be read in conjunction with the rest of Schedule 1 – Statement of Requirements.

1 DEFINITIONS AND ACRONYMS

1.1 In this Appendix, in addition to the definitions set out in Schedule 1 – Statement of Requirements and the main body of the Agreement:

1.1.1 "**ASTC**" means Apparent Sound Transmission Class;

1.1.2 "**NC**" means noise Criteria;

1.1.3 "**NIC**" means Noise Isolation Class;

1.1.4 "**NRC**" means Noise Reduction Coefficient. NRC is a single number rating of the sound absorbing properties of a material – derived by arithmetically averaging the Sabine absorption coefficients at 250 Hz, 1000 Hz, 2000 Hz and 4000 Hz. An NRC of 0.00 indicates zero absorption while; an NRC of 1.00 indicates 100% absorption;

1.1.5 "**Reverberation Time**" means the time (in seconds) required for the level of steady sound to decay by 60 dB, and is a measure used to quantify the quality of a room's acoustic environment with respect to verbal communication and musical quality; and

1.1.6 "**Speech Confidentiality**" means the sum of the composite STC and the A-weighted background noise level shall be at least 75.

2 ACOUSTIC SEPARATION AND DESIGN PRINCIPLES

2.1 The Design-Builder will:

2.1.1 provide an acoustic and vibration consultant who will review and provide direction for the design and detailing of all assemblies having acoustic separation and vibration isolation requirements, assemblies associated with Speech Confidentiality, acoustical wall and ceiling treatments and other building components to ensure adequacy for the intended separation and use of the space. The consultant will be a Professional Engineer registered in the Province of British Columbia with demonstrated experience in providing analysis and recommendations for acoustic and vibration performance of buildings;

2.1.2 locate noise sources remotely from sensitive areas;

2.1.3 isolate noise generated within the Facility at the source;

2.1.4 isolate plumbing and mechanical noise from the building structure;

2.1.5 ensure that the noise generated by mechanical equipment and diffusers along with design and detailing of vibration isolation for mechanical equipment is reviewed and directed by the acoustic and vibration consultant;

2.1.6 satisfactory acoustical performance is critical within the Facility, including but not limited to classrooms, music, dance, drama and Library Learning Commons. Furthermore, areas such as the gymnasium and service rooms, including the mechanical and electrical rooms and, if provided the generator room, all present unique challenges to minimize transmission of sound to adjoining spaces. Care must be taken throughout the design development phase and during Construction to ensure that the level of design and workmanship achieves and maintains the required room acoustic conditions, sound isolation performance of the assemblies and appropriate background noise level ratings; and

2.1.7 develop assemblies in consultation with their acoustic and vibration consultant. The suitability of the proposed assembly will be reviewed throughout design development and the final constructed assembly may, at the Owner's discretion, be subjected to in-situ testing to determine the ASTC by an independent agency prior to or after occupancy. In situ testing shall record a maximum of five (5) points below the STC target requirement.

2.2 Sound control will include:

2.2.1 attenuation of sound within public, student and staff environments;

2.2.2 sound isolation between the exterior and interior spaces;

2.2.3 sound isolation between interior spaces within the Facility at both horizontal and vertical separations;

2.2.4 sound and vibration isolation of building service noises and sound isolation of building service rooms;

2.2.5 a Facility layout so that noise sources are remote from sensitive areas;

2.2.6 where practicable, isolate noise generated within the Facility at the source; and

2.2.7 block flanking sound paths through fixed walls and floors and isolate plumbing and mechanical noise from the structure.

3 ACOUSTIC SEPARATION REQUIREMENTS

3.1 The Design-Builder will provide acoustic separation at the following locations in compliance with Section 4 and to conform to the STC values provided in Table 1: STC Value:

3.1.1 between areas of high noise generation (industrial education rooms, the gymnasium, music room) and all other areas;

3.1.2 between adjacent instruction, administration, and office spaces, and between those spaces and adjacent circulation spaces; and

3.1.3 between music instruction area and remainder of School by sound locks with double sets of doors.

3.2 The Design-Builder will provide acoustic separations as follows:

3.2.1 at walls, airborne sound insulation will be provided for gypsum board/steel stud assembly to close

off air leaks and flanking paths by which noise can go around the assembly. Assemblies will be airtight. Recessed wall fixtures such as cabinets or electrical, telephone and television which perforate the gypsum board surface, will not be located back-to-back. In addition, any opening for fixtures will be carefully cut to the proper size and piping penetrations will be appropriately sealed. Conduit/duct/piping penetrations will be sealed with tape and filled at the plenum barrier. The entire perimeter of a sound insulating assembly will be made airtight to prevent sound flanking. An acoustic caulking compound or acoustical sealant will be used to seal between the assembly and all dissimilar surfaces (including at window mullions);

3.2.2 for walls containing doors between classrooms and adjacencies that open only to one classroom space, the minimum STC ratings apply to the wall exclusive the door. In all other cases, the STC rating applies to the composite construction including the effects of doors, windows and all other penetrations;

3.2.3 construct walls, partitions between spaces to the STC value required by ANSI/ASA S12.60-2010 as appropriate for the types of adjacent spaces;

3.2.4 partition and ceiling construction will provide approximately the same degree of sound control through each assembly. When a partition is used for sound isolation, the sound control construction will extend from slab to slab;

3.2.5 optimum sound isolation requires that the integrity of gypsum board partitions and ceilings (mass) never be violated by vent or grille cut-outs or by recessed cabinets, light fixtures, surface mounted element or element penetrating the surface;

3.2.6 where penetrations are necessary, placing them back-to-back and next to each other will be minimized. Electrical boxes and outlets will be staggered, preferably by at least one stud space. Mineral fibre insulation will be used to seal joints around all cut-outs such as electrical, video and telephone outlets, plumbing escutcheons, recessed cabinets, and similar;

3.2.7 construct floor/ceiling assemblies of normally occupied rooms located above Formal Learning Spaces to have the IIC (Impact Insulation Class) required by ANSI/ASA S12.60-2010. Do not locate the gymnasium, dance rooms, or other high-floor impact activity areas over classrooms or other core learning spaces;

3.2.8 constructions such as ducts, rigid conduits, or corridors that act as speaking tubes to transmit sound from one area to another will be minimized. Common supply and return ducts will have sound attenuation liners at the diffuser and/or grill to maintain assemblies' STC. Conduit will be sealed;

3.2.9 to isolate structure-borne vibrations and sound, equipment capable of transmitting or inducing structure-borne vibrations and sound will be decoupled from the structure through use of vibration isolation mounting. Ducts, pipes, and conduits will have resilient, non-rigid boots or flexible couplings where they leave the vibrating equipment; and they will be isolated from the structure with resilient gaskets and sealant where they pass through walls, floors, or other building surfaces; and

3.2.10 acoustic screens, vibration isolators, and carefully selected exterior equipment will be used to prevent exterior noise that the neighbouring community might find offensive.

4 STC RATINGS

4.1 Walls and floors between the following spaces to meet or exceed performance of the STC value as follows:

Table 1: STC Value

Type	1	2	3	4	5	6	7	8
1	-	-						
2	-	-	-					
3	65	-	53					
4	65	60	60	50				
5	65	53	60	60	45			
6	65	55	60	53	55	50	50	
7	65	53	66	53	60	50	53	
8	65	53	53	53	53	50	50	45

4.2 Space Types for Table 1:

(1) Not used

(2) Building Engineering and Operations spaces, Weight Room

(3) Music Room (String)*, Music Room (Band)*, Music Room (Choral)*, Drama Studio*, Dance Studio*, Sound/Lighting Booth, Music Practice Rooms

(4) Library Learning Commons*

(5) Gymnasium Large, Gymnasium Small

(6) Administration, Health, Counselling and International Education offices, Staff Room

(7) Formal Learning spaces*

(8) General Storage spaces, Washrooms, custodial rooms, circulation

*****Refers to spaces that STC rating minimum apply to the wall (excluding door and windows). In all other cases, the STC rating applies to the composite construction including the doors and windows.

4.3 STC rating of 43 between spaces where moveable walls are incorporated.

4.4 For any given adjacency, where both adjacencies do not have an *, the lowest requirement for door performance applies when dissimilar wall with composite STC rating requirements are encountered.

4.5 STC 45 demising walls between classrooms and corridors is acceptable where ever there is an access door between the spaces.

4.6 Health & Fitness Studio/Weight Room (category 2) to Corridor (category 8) and Gymnasiums (category 5) to Corridor (category 8), where glazing is used shall be minimum STC 42 (6 mm

tempered glass – 12 mm airspace – 6 mm laminated glass).

4.7 Offices (category 6) to Corridor (category 8), where glazing is used and when immediately next to a door shall be STC 30 glazing (6 mm tempered glass) for up to 1 m^2 of glazing.

4.8 STC 30 rated doors between Offices (Category 6) to Corridor (Category 8) is acceptable.

4.9 Acoustical door is not required between General Storage Spaces, Washrooms, Custodial rooms, Circulation (Category 8) to General Storage Spaces, Washrooms, Custodial rooms, Circulation (Category 8).

4.10 STC 45 demising wall between general spaces and corridors and non-acoustical door for these adjacencies is acceptable.

4.11 The corridor acoustical requirement is with the consideration that space is being used as an ancillary learning space which functions are social interaction or similar activity other than formal instruction.

5 ACOUSTIC REQUIREMENTS FOR DOORS

5.1 Speech Confidentiality is required in private consultation rooms, including Principal's office and Vice Principal's Offices, and meeting rooms. Doors, sidelights and walls located in these rooms will be designed as an assembly to provide Speech Confidentiality. If doors and sidelights provided in these rooms have an STC rating lower than the wall in which they are located, the Design-Builder will provide an acoustic consultant's report confirming the assembly's acoustic performance and will verify the performance of the assembly with post-construction in-situ testing at 2 typical locations chosen by the Owner.

5.2 Acoustic Doors

5.2.1 Entry door assemblies to Music Rooms from corridors will be rated minimum STC 40. A vestibule entry composed of two sets of minimum STC 30 rated door assemblies will be considered to conform to STC 40 requirement. Entry door assemblies to Practice Rooms will be rated minimum STC 30 inclusive of vision light in door. All music room doors will be solid core wood doors with perimeter sound seal as per Section 6.7.9.1 (10) of Schedule 1 – Statement of Requirements. Such vestibules will:

5.2.1.1 provide maneuverability requirements (including door sizes wide enough) that are sufficient for moving large equipment;

5.2.1.2 ensure spatial layout is adequate; and

5.2.1.3 achieve required acoustic ratings.

6 ACOUSTIC TREATMENT REQUIREMENTS

6.1 Absorptive and reflective material to instruction spaces to provide acceptable acoustic conditions for instruction.

6.2 Acoustic treatment to have appropriate impact and wear resistant for each intended location.

6.3 Provide appropriate materials including acoustic wall panels, ceilings and decking to provide acceptable acoustic condition for the following areas:

6.3.1 Gymnasium: to be suitable for School meetings, assemblies and athletic events;

6.3.2 Music instruction: to be suitable for musical instruction, rehearsal, and recording. Provide non-parallel surfaces and provisions for uniform sound distribution;

6.3.3 Music practice rooms: to be suitable for rehearsal; and

6.3.4 Drama Studio, multi-purpose room: to be suitable for theatrical/musical instruction and performances, School meetings and assemblies, in accordance to standards by ANSI/ASA for appropriate and intended use.

7 REVERBERATION TIME (RT)

7.1 Maximum Reverberation Time to be in accordance with the requirements of ANS/ASI S12.60-2010 as appropriate for the type of space, and as the following table:

Table 2: Reverberation Time (RT)

Room type	Maximum unoccupied reverberation time (seconds)
Music Practice Rooms	0.3 – 0.4
Drama Studio	0.8 – 1.0
Music Room (Band)	0.6 – 0.8
Formal Learning Spaces – 250m^3 volume or less	0.6
Formal Learning Spaces – 250m^3 to	0.7
Formal Learning Spaces – Larger than 566m^3	0.8 – 1.0
Offices	0.7
Music Room (Strings)	0.8
Library Learning Commons	0.8
Open Office Workstations	0.8
Music Room (Choral)	0.8 – 0.9
School Commons	1.1
Gymnasium	1.5

7.2 Reverberation Time calculation through sampling procedure will be performed by an acoustical engineer. Reverberation Time will be measured when the calculated reverberation time exceeds the limits from Appendix 1C – Acoustic and Noise Control Ratings -Table 2. Measurements will be conducted in conformance to ASTM E336.

7.3 Refer to Appendix 1J – Auditorium Specifications for information on RT for the Auditorium and supporting spaces.

8 BACKGROUND NOISE LEVEL (BNL)

8.1 The maximum background noise levels shall include the sound from all relevant HVAC sources and paths and do not apply to teaching equipment that can be switched on and off as needed.

8.2 Refer to ANSI/ASA S12.60-2010 for definitions of terms and further information.

8.3 Maximum reverberation time to be in accordance with the requirements of ANSI/ASA S12.60-2010 as appropriate for the type of space, and as the following table:

Table 3: Background Noise Level (BNL)

	Maximum one-hour-average A-weighted steady background noise level, dB	Maximum unoccupied reverberation time (seconds)
Formal Learning space* with enclosed volume <283 m^3	40	0.6
Formal Learning space with enclosed volume > 283m^3 and ≤ 566 m^3	40	0.7
Formal Learning spaces with enclosed volumes > 566 m^3 and ancillary learning spaces**	40	See 3.3. in annex C of ANSI S12.60-2010 – Part 1

8.4 ***** Refers to spaces that STC rating minimum apply to the wall (excluding door and windows). In all other cases, the STC rating applies to the composite construction including the doors and windows

8.5 ** Ancillary learning spaces are spaces where good communication is important but for which the primary functions are informal learning such as corridors, Food Servery and the Gymnasium.

8.5.1 When corridors and Gymnasium are not used for structured learning activities, the one-hour average A-weighted background noise level in such spaces shall not exceed 45 dBA.

8.6 When the Facility achieved Substantial Completion, background noise levels through sampling procedure within spaces with expected highest level of background noise will be conducted by the Design-Builder's acoustical engineer to verify that the Facility meets the acoustical requirements and ANSI 12.60 standard criteria.

9 CHILDCARE CENTER REQUIREMENTS

9.1 The general principles for acoustic performance outlined in sections 1-8 of Appendix 1C apply to the Childcare Centre.

9.2 Background noise level in unoccupied, furnished Childcare Centre indoor spaces to meet maximum one-hour-average A-weighted steady background noise level of 40dB.

9.3 Maximum reverberation time in unoccupied, furnished Childcare Centre indoor spaces to be 0.6 seconds.

9.4 Exterior noise:

9.4.1 Outdoor play areas will be acoustically buffered from traffic noise, mechanical equipment noise and any other disruptive noises to achieve a maximum sound pressure level of 55 dB(A) 24 hour equivalent sound level.

9.5 Exterior-to-interior noise:

9.5.1 Exterior noise, such as traffic, mechanical equipment or other disruptive noises will be controlled by acoustical design of the exterior wall assemblies to meet the allowable noise level for residential living, dining, and recreation rooms as defined in the local zoning by-law. Under no circumstances is the exterior noise to exceed a sound pressure level of 45 dB(A) 24 hour equivalent sound level in the interior of the Childcare Centre in all spaces occupied by children.

9.6 Interior-to-interior noise from spaces outside the Childcare Centre:

9.6.1 Provide STC rating of 65 at party walls between the Childcare Centre and any adjacent non-Childcare Centre interior spaces.

9.7 Interior noise within a Childcare Centre will be controlled with acoustic surface treatment for interior finishes:

9.7.1 75% of ceiling area will be T-bar ceiling with NRC (noise reduction coefficient) = 0.70 or better, or

9.7.2 Alternately the room design will meet an equivalent acoustical performance; and

9.7.3 Ceilings are not to exceed 3m; if a deviation to this be accepted, additional acoustic treatment is required.

APPENDIX 1D

FURNITURE, FIXTURES AND EQUIPMENT

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APPENDIX 1D

FURNITURE, FIXTURES AND EQUIPMENT

1. DEFINITIONS

1.1 In this Appendix:

(a) "**Acceptance Protocol**" has the meaning set out in Section 5.11 of this Appendix;

(b) "**Category 1 Equipment**" means the furniture, fixtures and equipment described and listed as "Category 1" in the Equipment Lists (or similar equipment);

(c) "**Category 2 Equipment**" means the furniture, fixtures and equipment described and listed as "Category 2" in the Equipment Lists (or similar equipment);

(d) "**Category 3 Equipment**" means the furniture, fixtures and equipment described and listed as "Category 3" in the Equipment Lists (or similar equipment);

(e) "**Commission**" means to test and commission the equipment or system in accordance with any commissioning requirements set out in this Agreement, and applicable standards and good industry practice, including to ensure that the Equipment is operating in accordance with the manufacturer's requirements and specifications, and "Commissioned" and "Commissioning" have a corresponding meaning;

(f) "**Deliver**" means to deliver Equipment to the Facility, and "Delivered" and "Delivery" have corresponding meanings;

(g) "**Equipment**" means the Category 1 Equipment, the Category 2 Equipment and the Category 3 Equipment as described in this Appendix;

(h) "**Equipment Committee**" means the committee established pursuant to Section 5.8 of this Appendix;

(i) "**Equipment Lists**" means the lists of Equipment included in the "Equipment and Accessories" and "Existing Equipment" sections of both the School Room Data Sheets and the Childcare Centre Room Data Sheets and in Appendix 1G – Food Services Equipment.

(j) "**Equipment Logistics Schedule**" has the meaning set out in Section 5.12 of this Appendix;

(k) "**Install**" means to install in the Facility, including making connections to necessary building services (including plumbing, heating, cooling, ventilation dust and fume extraction and electricity) and connections to necessary communication or network interfaces or devices, and "Installed" and "Installation" have corresponding meanings;

(l) "**Receive**" means the provision of equipment and staff to accept Delivery and provide an appropriate and secure staging and storage area to be used prior to Setup, and "Received" and "Receiving" have corresponding meanings;

(m) "**Setup**" includes:

(i) transportation and movement within the Facility from the Delivery or storage location to the final installation location;

(ii) placement in the final location within the Facility; and

(iii) any necessary unwrapping, unpacking, disposing and/or recycling all wrapping and packaging materials, assembly; and

(n) "**Supply**" means the management and completion of procurement processes, up to and including Delivery, for Equipment, including the payment to vendors, and "Supplied" has a corresponding meaning.

2. CATEGORY 1 EQUIPMENT (DESIGN-BUILDER SUPPLIED, DESIGN-BUILDER INSTALLED)

2.1 Responsibilities for Category 1 Equipment

The Design-Builder will Supply, Deliver, Receive, Setup, Install and Commission all Category 1 Equipment. Category 1 Equipment is also referred to as 'CSCI' in the Equipment Lists.

2.2 Standards for Equipment

The Design-Builder will cause all Category 1 Equipment to be:

(a) new;

(b) of good quality and in a safe, serviceable and clean condition

(c) in accordance any applicable specifications or requirements in the Equipment Lists;

(d) of the type specified in the Statement of Requirements, if applicable;

(e) in compliance with all Laws; and

(f) in compliance with all certifications or standards that would be reasonable for similar equipment in a similar application if Supplied and Installed by the Owner.

The Design-Builder will, as soon as practicable after receiving a request from the Owner, supply to the Owner evidence demonstrating its compliance with this Section 2.2.

2.3 Warranties

The Design-Builder will ensure that all manufacturer's and vendor's warranties for all Category 1 Equipment:

(a) commence no earlier than the date of first use of the relevant item of Category 1 Equipment; and

(b) are in the Owner's name.

2.4 Training

The Design-Builder will include the Owner's staff and other representatives in all stages of the Receiving, Setup, Installation and Commissioning to ensure there is a comprehensive overview of the Category 1 Equipment, including its features, calibration and interfaces. The Design-Builder will

provide prior notice to the Owner to allow such participation.

The Design-Builder will be knowledgeable on the proper use and maintenance of all Category 1 Equipment and will provide sufficient training and education to the Owner and persons designated by the Owner to enable proper use and maintenance of the Category 1 Equipment. The Design-Builder will not be responsible for providing the Owner with training and education in respect of Category 2 Equipment and Category 3 Equipment.

On or before the Target Substantial Completion Date, the Design-Builder will transfer and deliver to the Owner all guidance material and manuals relating to Category 1 Equipment items as produced and provided by the manufacturer or the vendor of such items.

3. CATEGORY 2 EQUIPMENT (OWNER SUPPLIED, DESIGN-BUILDER INSTALLED)

3.1 Responsibilities For Category 2 Equipment

The Owner intends to, but is not obligated to, Supply the Category 2 Equipment. Category 2 Equipment is also referred to as 'OSCI' in the Equipment Lists. Where applicable, the Owner may, at its discretion Supply new Category 2 Equipment in lieu of relocating existing Category 2 Equipment.

The Design-Builder will Receive, Setup, Install and Commission all Category 2 Equipment.

The Design-Builder will be responsible for notifying the Owner of any Category 2 Equipment that is Delivered damaged or short of the complete quantities on the weigh bill/bill of lading. Such discrepancy will be noted on the weigh bill/bill of lading provided to the shipper.

3.2 Timing of Delivery and Installation of Category 2 Equipment

The Design-Builder will:

(a) as early as practicable provide on the Equipment Logistics Schedule the dates by which each item of Category 2 Equipment must be Delivered, Installed and Commissioned so as not to delay the Design, the Construction, Substantial Completion or the Owner's use and occupation of the Facility; and

(b) as required from time to time until Substantial Completion, but no less than once per calendar month, update the information in Section 3.2(a) above so that at all times it is an accurate, reasonable and realistic representation of the Design-Builder's plans for the completion of the Design and Construction of the Facility.

The Owner will cause each item of Category 2 Equipment to be Delivered by the date specified by the Design-Builder under Section 3.2(a) above.

4. CATEGORY 3 EQUIPMENT (OWNER SUPPLIED, OWNER INSTALLED)

4.1 Responsibilities For Category 3 Equipment

The Owner intends to, but is not obligated to, Supply, Receive, Setup, Install and Commission the Category 3 Equipment. Category 3 Equipment is also referred to as 'OSOI' in the Equipment Lists. Where applicable, the Owner may, at its discretion Supply new Category 3 Equipment in lieu of relocating existing Category 3 Equipment.

4.2 Timing of Delivery and Installation of Category 3 Equipment

The Design-Builder will:

(a) as early as practicable:

(i) for each item of Category 3 Equipment, provide on the Equipment Logistics Schedule the earliest date when the Facility will be available to the Owner to Install such item, which date must, for all Category 3 Equipment and any required Setup or Installation equipment that will not fit through the constructed doorways and other physical constraints on access, be a reasonable period in advance of the construction of such doorways and other physical constraints on access; and

(ii) identify to the Owner the date by which each item of Category 3 Equipment must be Delivered, Installed and Commissioned so as not to delay the Design, the Construction, Substantial Completion of the Facility or the Owner's use and occupation of the Facility; and

(b) as required from time to time until Substantial Completion, but no less than once per calendar month, update the information in Section 4.2(a) above so that at all times it is an accurate, reasonable and realistic representation of the Design-Builder's plans for the completion of the Design and Construction of the Facility; and

(c) provide electrical power, mechanical connections and the required infrastructure for the Category 3 Equipment as per the specific equipment requirements.

The Owner will cause the relevant item of Category 3 Equipment the Owner wishes to have Installed in the Facility to be Delivered by the date specified by the Design-Builder under Section 4.2(a) above.

Subject to Section (a)(i) above and unless otherwise noted on the Equipment Lists or the Equipment Logistics Schedule, no Category 3 Equipment will be Delivered prior to Substantial Completion. Delivery after Substantial Completion will not relieve the Design-Builder of its obligations under the Agreement to complete the Design and Construction to accommodate the Equipment in the Facility and the obligations under this Appendix.

5. GENERAL

5.1 School Room Data Sheets and Childcare Centre Room Data Sheets

The equipment quantity listed under the "Existing Equipment" section for rooms coded as 'RT' in both the School Room Data Sheets and the Childcare Centre Room Data Sheets is a total cumulative count, not a quantity for an individual room.

5.2 Integration of Equipment with Design of Facility

The Design-Builder will ensure that all Equipment is integrated with the overall Design of the Facility and will include such Equipment as part of the development of Design under this Agreement. To the extent practicable, any required changes to the Design of the Facility as a result of changes to Equipment requirements will be resolved as part of the Design development process.

5.3 Changes affecting Design or Construction

If the Owner increases or decreases the quantities of Equipment, procures other items in substitution for those identified on the Equipment Lists or otherwise changes the items to be procured and there is

an effect on the Design or Construction, such increase, decrease, procurement or change, and the effect thereof, will constitute a Change. The parties will endeavour to agree to an expedited Change process to deal with Equipment changes.

5.4 Staging and Storage

The Design-Builder will:

(a) provide a secure, dry space to accommodate staging and storage of Equipment;

(b) allow Owner representatives to access and work within the space;

(c) ensure that the space is able to maintain a reasonable temperature to store and work in; and

(d) provide power to the space and will notify the Owner, in advance, of any power interruptions.

5.5 Storage Costs

The Owner will reimburse the Design-Builder for any incremental out of pocket storage costs for any item of Category 2 Equipment or Category 3 Equipment if such item is Delivered materially in advance of the earliest delivery date for such item as identified by the Design-Builder under Section 3.2(a) or 4.2(a) of this Appendix in the Equipment Logistics Schedule.

Any storage costs incurred by the Design-Builder due to Equipment being Delivered by the delivery date as set out in the Equipment Logistics Schedule delivery date, but not ready for Setup, will be borne by the Design-Builder.

5.6 Equipment Commissioning

The Design-Builder will incorporate its Commissioning responsibilities under this Appendix into its commissioning activities for the Facility as contemplated in this Agreement.

All Category 2 Equipment and Category 3 Equipment must be Commissioned, and the Acceptance Protocol completed where applicable, prior to Substantial Completion.

5.7 Addition of Additional Equipment or Replacement of Existing Equipment

If the Owner identifies Equipment that is in addition to, or in replacement of certain items of, the Equipment, the Owner may in its discretion:

(a) elect to have the Design-Builder Supply, Deliver, Receive, Setup, Install and/or Commission such additional Equipment, in accordance with and subject to the procedures for Changes; or

(b) itself perform any of such activities.

5.8 Equipment Committee

The parties will establish an Equipment Committee composed of 2 (or any other number agreed between the parties) representatives of each party. The Equipment Committee will meet regularly (and not less than once per month) to review the status of, and to provide advice to the parties with respect to the Equipment Supply, Delivery, Receiving, Setup, Installation and Commissioning.

5.9 Title

The Design-Builder will cause the procurement arrangements for Category 1 Equipment to provide for a direct transfer of title to such Equipment from the vendors to the Owner. Title to Category 1 Equipment may be reserved by third party unpaid vendors until the earlier of the date of payment and the Target Substantial Completion Date. The Design-Builder will pay all such unpaid vendors prior to the Target Substantial Completion Date for amounts owing on outstanding invoices.

5.10 Damage and Loss

Any damage or loss occurring prior to the Substantial Completion Date to:

(a) Category 1 Equipment or Category 2 Equipment after it has been Received; or

(b) Category 3 Equipment after it is Installed if it is installed prior to the Substantial Completion Date,

is the responsibility of the Design-Builder.

5.11 Acceptance Protocol

The Design-Builder will provide a document to the Owner for each items of Category 1 Equipment and Category 2 Equipment that certifies all testing of the relevant Equipment has been completed to demonstrate that it has been installed in accordance with the manufacturer's requirements and is functioning in accordance with the specifications included in the relevant equipment purchase contract or purchase order (the "**Acceptance Protocol**").

Without limiting the Design-Builder's obligation to Commission the relevant Equipment, the Design- Builder will, to the Owner's reasonable satisfaction, complete all of the aspects of the Acceptance Protocol for each item of Category 1 Equipment and Category 2 Equipment.

If:

(a) prior to the Substantial Completion Date, the Design-Builder fails to complete any aspect of an Acceptance Protocol for any item of Category 1 Equipment or Category 2 Equipment; and

(b) the Owner waives the requirement for the Design-Builder to complete the relevant Acceptance Protocol prior to the Substantial Completion Date,

then subject to meeting the other requirements for Substantial Completion of the Facility each such failure will be a deficiency and the Owner may make a deficiency withholding described in the Agreement.

5.12 Equipment Logistics Schedule

The Design-Builder will propose a draft schedule (the "**Equipment Logistics Schedule**") within 30 days after the Effective Date and the parties will seek to finalize the Equipment Logistics Schedule, each party acting reasonably, within 90 days after the Effective Date, in accordance with the following principles:

(a) in order to take advantage of the most recent technological advances, final decisions on the selection of Equipment sensitive to or anticipated to be revised with newer technology prior to the Target Substantial Completion Date, together with any training or service requirements, will not be made by the Owner until as late as possible in the

period for Construction;

(b) the Design-Builder will require adequate time to issue competitive bidding documents, receive proposals, clarify aspects of proposals, and Receive, Install and Commission the Equipment;

(c) the Owner will require the ability to take advantage of bulk or other purchase opportunities advantageous to it; and

(d) the Design-Builder will undertake the precautions set out by Equipment vendors to protect any Equipment that is required to be Delivered or Installed while construction is still underway; however, as an additional precaution some sensitive Equipment (such as equipment with electronic components) may require Delivery, Installation and Commissioning dates that are late in the period for Construction.

The parties may modify the Equipment Logistics Schedule by mutual agreement, each acting reasonably.

APPENDIX 1E

CHILDCARE CENTRE REQUIREMENTS

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SECTION 1 - INTRODUCTION

1.1 General

1.1.1 Definitions

1.1.1.1 For all definitions, see the Statement of Requirements.

1.1.2 Guiding Principles

1.1.2.1 The Design-Builder will create a safe, secure, licensable Childcare Centre that provides a range of opportunities for the social, intellectual, and physical development of children. In order for a Building Permit and an Occupancy Permit to be issued, and subsequently for an Operator to be eligible for a license for the Childcare Centre, Vancouver Coastal Health Community Care Facilities Licensing must provide their approval of the physical premises (i.e. “sign-off”).

1.1.3 Overview

1.1.3.1 The Design-Builder will design and construct a Childcare Centre comprised of 69 licensed spaces (Infant, Toddler, Preschooler and Preschool) with indoor program areas accompanied by adjacent outdoor play areas, including covered outdoor play space (fit, finished and equipped by the Design-Builder as described in the Childcare Centre Room Data Sheets).

1.1.3.2 The Childcare Centre will be comprised of the following connected Group spaces:

1.1.3.2 (1)	12 spaces	Infant Group;
1.1.3.2 (2)	12 spaces	Toddler Group;
1.1.3.2 (3)	25 spaces	Preschooler Group; and
1.1.3.2 (4)	20 spaces	Preschool.

1.1.3.3 The Child Care Licensing Regulation in the *Community Care and Assisted Living Act* (British Columbia) provides the minimum operational and design requirements for the Childcare Centre related to licensing. More specifically, the Vancouver Coastal Health Community Care Facilities Licensing Program (CCFL) is the licensing agency for the Childcare Centre. The Childcare Centre plans require review and approval by the licensing agency, so consultation with Vancouver Coastal Health Care Facilities Licensing Program early in the design is required, as well as at key milestones throughout the project.

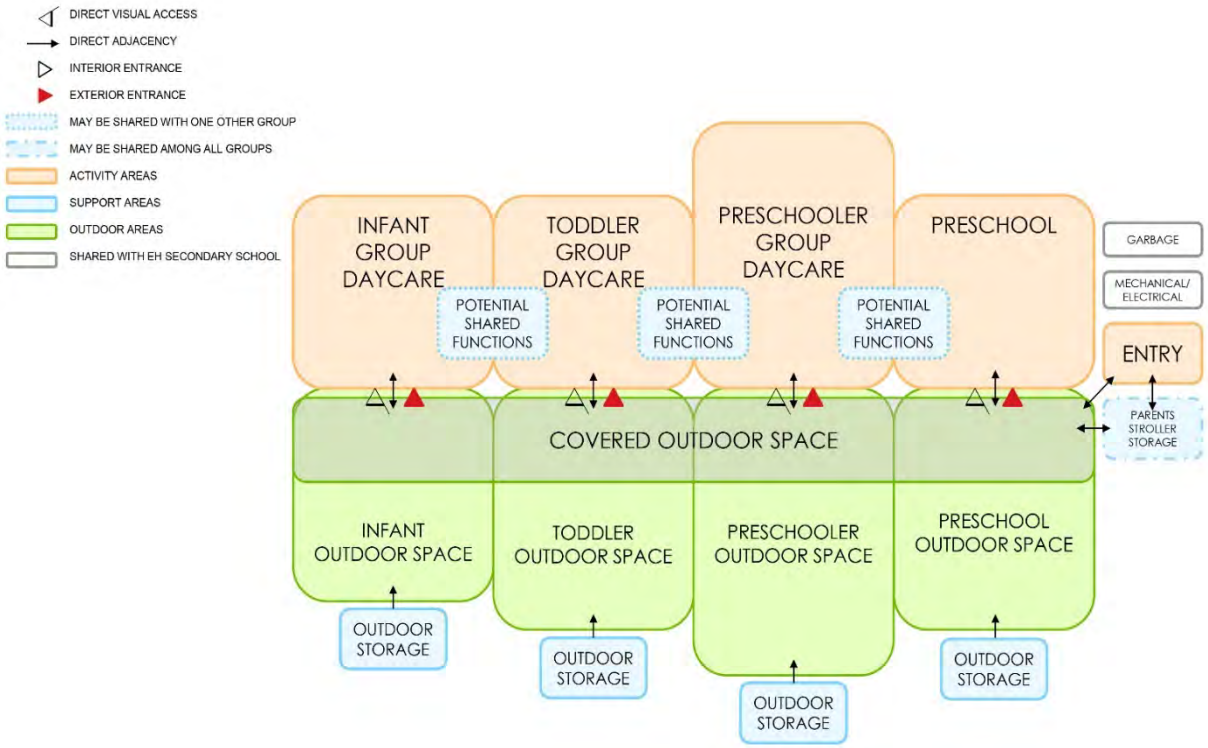
1.1.3.4 Further, the City of Vancouver has developed “Childcare Design Guidelines” and “Childcare Technical Guidelines” which are publicly available on its website. The Design-Builder is responsible for reviewing the guidelines in developing their design of the Childcare Centre.

1.1.3.5 The Design-Builder will locate the Childcare Centre on the highest occupied level of the Facility, will be fully integrated into the structure of the Facility, and will have a separate entrance.

1.1.3.6 The Design-Builder will locate the Childcare Centre at the east end of the Facility, to minimize the impact of noise and airborne pollution generated from Oak Street.

1.1.3.7 The Design-Builder will provide the Childcare Centre with an at-grade, dedicated, separate entrance vestibule and stairs. Vertical circulation (elevator and exit stairs) will be shared by the Childcare Centre and the School. Refer to Section 6.12 - Conveying Equipment (Division 14) of the Statement of Requirements. For half-height handrail requirement, refer to Section 4.9.4.1(13) of the Statement Requirements.

1.1.4 Overall Childcare Centre Adjacency Diagram



Space Relation and Adjacency Diagram 1: Overall

1.1.5 Overall Area Summary

1.1.5.1 Table 1 is a summary of space requirements for the Childcare Centre.

Table 1: Overall Childcare Areas

Reference	Minimum Net Activity Area (SM)	Minimum Net Support Area (SM)	Outdoor Area (SM) Covered & Uncovered	Outdoor Storage (SM)	Total Group Area (SM)
1.0 Infant Group Daycare - 12 Spaces	82 Room #: 15.01.001-15.01.003	58 Room #: 15.01.004-15.01.011	85 Room #: 15.01.012	2.8 Room #: 15.01.013	227.8
2.0 Toddler Group Daycare - 12 Spaces	82 Room #: 15.02.001-15.02.004	58 Room #: 15.02.005-15.02.012	170 Room #: 15.02.013	2.8 Room #: 15.02.014	312.8
3.0 Preschooler Group Daycare – 25 Spaces	128 Room #: 15.03.001-15.03.004	62 Room #: 15.03.005-15.03.012	350 Room #: 15.03.013	4.6 Room #: 15.03.014	544.6
4.0 Preschool – 20 Spaces	78 Room #: 15.04.001-15.04.002	49 Room #: 15.04.003-15.04.007	140 Room #: 15.04.009	3.7 Room #: 15.04.010	270.7
Total Minimum Net Area	**370.0**	**227.0**	**745.0**		
Net to Gross Ratio	1.3	1.3			
Total Minimum Gross Area	**481.0**	**295.1**			

Additional Area		
5.0 General Shared Childcare Spaces	**Indoor Spaces (SM)**	**Outdoor Spaces (SM)**
• Childcare Centre Entry Level 1 (includes entry vestibule, stair, and shared elevator with school)	57.4 Room #: 15.05.001	
• Childcare Centre Entry Level 4 (includes only entry vestibule)	24.3 Room #: 15.05.002	
• Parent Stroller Storage		9.5 Room #: 15.05.003
Total Additional Area (SM)	**81.7**	**9.5**

1.1.5.2 Note that room numbers given in this Table 1 relate to the Childcare Centre Room Data Sheets.

1.1.5.3 Because four Groups are aggregated, support spaces may be shared but there will be no reduction in total area.

1.1.5.4 The Design-Builder's design of the shared spaces will encourage cross-daycare contact and opportunities to share materials and equipment. Refer to Section 2.2.5.9 – Shared Support Spaces for additional space requirements when four Groups are aggregated in the Childcare Centre.

1.1.5.5 Sufficient space is essential to quality childcare. The space requirements are based on research and experience with custom-designed childcare facilities in high-density, urban settings. Note that these requirements are higher than the provincial community care facility minimums. Refer to Section 3 for area requirements per Group and to the Childcare Centre Room Data Sheets for room-by-room area requirements.

1.1.6 Understanding This Document

1.1.6.1 This document is the compilation of space requirements, relationships, and adjacencies and is used to translate the findings into design criteria. Sections 1 – 4 present a summary of the Childcare Centre scope and general requirements for each functional component as they relate to use, location, and adjacencies within the context of the Facility. Detailed information for each programmed room in the Childcare Centre can be found in the Childcare Centre Room Data Sheets.

SECTION 2 - GENERAL PLANNING CRITERIA

2.1 SITE & BUILDING REQUIREMENTS

2.1.1 Site and Access

The Design-Builder will:

2.1.1.1 ensure that access from the street or drop-off area to the Childcare Centre is as direct and simple as possible;

2.1.1.2 ensure that pedestrian access to the Childcare Centre is safe, secure, and universally accessible; and

2.1.1.3 provide convenient access to the Childcare Centre for strollers and bikes.

2.1.2 Parking and Drop-off Areas

The Design-Builder will:

2.1.2.1 provide safe vehicular access to the Childcare Centre as described in section 4.12.2 Vehicular Access and Parking of the Statement of Requirements;

2.1.2.2 provide dedicated drop-off parking stalls for parents and staff parking as described in Section 4.12.2 – Vehicular Access and Parking of the Statement of Requirements;

2.1.2.3 provide one drop-off stall for every eight (8) full-time equivalent Childcare spaces;

2.1.2.4 locate drop-off parking as close as possible to the Childcare Centre entry and in no case more than 100 metres from the entry;

2.1.2.5 provide only full-size drop-off parking spots, not small car only spaces which do not allow for easy loading and unloading of children into car seats;

2.1.2.6 ensure drop off spaces include a maximum of one handicapped accessible space;

2.1.2.7 provide a minimum of two on-site parking spaces for the Childcare Centre staff; one for the first staff member to arrive in the morning and one for the last staff member to leave in the afternoon;

2.1.2.8 provide secure bicycle parking for Childcare Centre staff and parents as follows:

2.1.2.8 (1) secure bicycle parking will be provided in accordance with the City's "Bicycle Parking Guidelines"; and

2.1.2.8 (2) ensure bicycle parking for parent drop-off will be within easy access of the Childcare Centre entrance.

2.1.3 Air Quality

The Design-Builder will:

2.1.3.1 ensure that the outdoor play area is protected from noise, dirt, wind, pollution, and noxious smells;

2.1.3.2 not locate exhaust vents from building or parking garages and other hazardous elements adjacent to outdoor play areas; and

2.1.3.3 ensure that science labs and their venting and exhaust are not directly adjacent to the Childcare Centre and are located as far from the Childcare Centre as possible. This will be accommodated at the outset of the design to avoid issues with licensing.

2.1.4 Sunlight, Natural Light, and Provision of Shade

The Design-Builder:

2.1.4.1 acknowledges and agrees that availability of natural light is important to the creation of a suitable childcare space;

2.1.4.2 will ensure that sunlight penetrates into the outdoor area for a minimum of three hours per day at the winter solstice, two hours of which will occur during the typical playtimes of 9:30 to 11:30 or 1:30 to 4:00. This is important in Infant and Toddler programs due to the limited mobility of the children;

2.1.4.3 protect sunlight access by design techniques such as glazing in south-facing fences or parapets. Sun will reach the transition zone between indoor and outdoor space;

2.1.4.4 ensure south side fences or parapets are glazed or open;

2.1.4.5 ensure that all major indoor activity spaces used by children will have a direct source of natural light from a minimum of 10 percent of the wall area of the room. These major spaces will have a balanced distribution of windows;

2.1.4.6 will prioritize natural light (which is preferred, but not required) for staff offices and rooms;

2.1.4.7 not be required to ensure natural light in support areas such as washrooms, kitchens and storage rooms;

2.1.4.8 use non-glare surfaces on highly exposed sun areas; and

2.1.4.9 provide removable solar shades for a portion of the outdoor play area, specifically over play elements such as the sandbox.

2.1.5 Surveillance

The Design-Builder will:

2.1.5.1 ensure that the entire Childcare Centre and its entries are visible to many people and adjacent to actively used public circulation routes. Entries and routes will be well lit; and

2.1.5.2 ensure the main entry will be immediately recognizable as a childcare with effective signage and domestic scale design elements.

2.1.6 Exiting

The Design-Builder will:

2.1.6.1 plan public exits in such a way that the public does not have to cross through a secure Childcare Centre space for exiting; and

2.1.6.2 install half-height handrails in exit stairs to be used by Childcare Centre egress, in addition to full-height handrails.

2.1.7 General Hazards and Entrapment

2.1.7.1 For prevention of entrapment, the Design-Builder will ensure that spaces (i.e. holes or openings) accessible to children must be smaller than 90 millimetres or larger than 230 millimetres. Slots that vary in dimension such that either of the above conditions are encountered are not acceptable.

2.1.7.2 The Design-Builder will not permit small dimension protuberances that may cause eye or puncture injuries.

2.1.7.3 The Design-Builder will ensure that all edges and corners are rounded and eased. Sharp edges and corners are not acceptable.

2.1.8 Garbage and Recycling

2.1.8.1 The Design-Builder will accommodate recycling and composting and include both for interior and exterior planning. The Childcare Centre will have a dedicated garbage collection incorporated in the School garbage collection area located at grade level. Refer to Section 4.12.2.1(24) of the Statement of Requirements.

2.1.9 Building Form

The Design-Builder will:

2.1.9.1 provide space and headroom for mechanical and electrical equipment and maintain minimum 2.44 metre clear ceiling heights throughout the Childcare Centre;

2.1.9.2 ensure minimum of floor-to-floor height of 3.66 metres; and

2.1.9.3 design the Childcare Centre to prevent the entry of pests.

2.2 INTERNAL DESIGN OF THE CHILDCARE CENTRE

2.2.1 Activity Settings

2.2.1.1 Comfortable surroundings reduce anxiety, promote understanding, and enable children to engage in genuine exploratory and discovery behaviours. Detailed information relating to programmed rooms within each Group can be found in the Childcare Centre Room Data Sheets.

2.2.1.2 Each Group has a number of activity settings. Activity settings are designated areas in which activities or programs directly involving the children take place. Activity settings are to be designed to accommodate a variety of discrete activities. Some examples of activity settings are art-sensory, puzzles and manipulative toys, climbing and crawling, dramatic play, and reading.

2.2.1.3 Provision of specific numbers of activity settings is a key determinant of the quality of the childcare program. See Section 3.1, 3.2, 3.3, and 3.4 for the minimum number of activity settings and activities by Group.

2.2.1.4 Large settings such as dramatic play and large blocks can be represented in planning by a 3 metre diameter circle.

2.2.1.5 Small settings for intense activities such as puzzles can be represented by a 2 metre diameter circle (size varies by age group and activity).

2.2.1.6 Movement activities require a dedicated area which will include convenient storage for wheeled toys, large blocks, musical instruments, and climbing equipment.

2.2.1.7 Activity settings are defined by the following: physical location, visible boundaries, work and sitting surfaces, materials storage and display, a mood or personality. Activity settings will be:

2.2.1.7 (1) delineated by a combination of fixed and movable elements;

2.2.1.7 (2) fixed elements include changes in level, ceiling height, materials, room corners, partial walls, and special windows; and

2.2.1.7 (3) movable elements include movable and hung partitions, bookcases, storage units, and furniture. Ramps will be used where changes in level are employed.

2.2.1.8 Activity settings will include places to observe, to play alone, to play alongside, and to play together.

2.2.1.9 Retreat points will be provided adjacent to activity areas and will be visually monitorable by staff in the main activity area.

2.2.2 Activity Room

The Design-Builder will provide an activity room that complies with the following requirements:

2.2.2.1 the activity room will be the largest of the program spaces. It will include a mixture of open spaces and smaller alcove-type spaces and will be designed to accommodate a variety of activity settings. The design will emphasize flexibility by utilizing movable elements to define spaces;

2.2.2.2 an irregular square with alcoves and nooks is a suitable shape for the room. Avoid long, narrow rooms. The plan will direct children from one activity to the next and delineate, protect, and support activities in each setting;

2.2.2.3 zone the activity settings such that noisy and quiet, intense and calm, and messy/wet and tidy activities are separated. These zones will be shown on submitted plans;

2.2.2.4 the messy/wet zone will be used for art activities and eating and will be located adjacent to the kitchen and to the outdoor play area so that, on sunny days, doors can be open, and activities can flow between indoor and outdoor areas. There will be enough space for art/eating tables, easels, water and texture tables, and storage. Enough space is required to seat all children at once for snacks and meals; and

2.2.2.5 circulation within an activity room will be clear and straightforward, but not overly simplified and uninteresting. The optimum circulation path is highly visible and snakes throughout the space, overlooking each activity. "Shopping" among activities is itself an activity. Circulation paths will respect the boundaries of activity areas by meandering around but not passing through activity settings. Allow space for children engaged in activities to play uninterrupted by others passing by them.

2.2.3 Gross Motor / Nap Room

The Design-Builder will provide a gross motor/nap room that complies with the following requirements:

2.2.3.1 an enclosed gross motor/nap room that can be opened up to the activity room to promote shared use and flexibility. When used as a gross motor room, it will be the setting for noisy, boisterous, physical activities such as climbing, group games, or larger scale, intense, small group activities such as large blocks, music, and noise makers. It will also accommodate large scale group activities such as singing and circle time;

2.2.3.2 as a nap room, it will allow children to sleep without being disturbed by activities around them;

2.2.3.3 the room will be located away from outdoor play areas;

2.2.3.4 one corner will be designed for large block play with child accessible storage for the blocks; and

2.2.3.5 another corner will be for music with both higher, adult-only storage for a music player and instruments and child accessible storage for instruments. Larger physical play equipment can be moved into the room from storage.

2.2.4 Quiet Room

The Design-Builder will provide a quiet room that complies with the following requirements:

2.2.4.1 a quiet room will be provided for Toddler, Preschooler, and Preschool Groups;

2.2.4.2 the quiet room will be a separate room with a door which can be used for quiet activities involving one staff member and up to three children. There will be enough space for a small table, chairs, and some storage; and

2.2.4.3 a quiet room fulfills a number of other useful functions: a space where children can be quiet and escape briefly from the hubbub of the activity room, a room for the use of professionals working with children on a one-to-one basis, and a place where sick children can rest while waiting for parents to pick them up.

2.2.5 Support Spaces

The Design-Builder will provide support spaces that comply with the following requirements:

2.2.5.1 Kitchen

2.2.5.1 (1) provide a kitchen for the preparation and clean-up of snacks and lunches. Two Groups may share one kitchen if it is readily accessible by both Groups;

2.2.5.1 (2) kitchens may be located in an alcove within the primary activity space but separated from the activity room by a child-height counter. This permits children to be included in the kitchen activities without bringing them into the kitchen itself which raises safety concerns. It also allows staff to supervise activities in the activity room while in the kitchen. An open kitchenette (along a wall) is not permissible;

2.2.5.2 Cubby Area

2.2.5.2 (1) provide a separate cubby area for each Group. This area will be directly accessible to the washroom and to the outdoor covered play

area. One cubby for each child will be provided and extra cubbies for part-time children will be included. The number of cubbies required is equal to the licensed capacity of the Group plus an extra 20% for part-time children. There will be open floor space for a group of eight (8) children and one (1) staff member to get dressed for winter conditions separated from the activities of the other children;

2.2.5.2 (2) the cubby area is best located immediately inside the entry used by children when using the outdoor play yard. This arrangement ensures that wet and muddy outer clothes and boots are not brought into the activity areas of the Childcare. If possible, parents of Infants and Toddlers will enter through the cubby area so that shoes can be removed before entering areas where children are playing on the floor;

2.2.5.3 Indoor Storage

2.2.5.3 (1) storage is a key factor in providing good childcare. Provide for three categories of storage for each Childcare Group:

2.2.5.3 (1) (a) active storage - accessible to children from the activity setting;

2.2.5.3 (1) (b) semi-active storage shelves and cabinets accessible to staff above or near activity settings; and

2.2.5.3 (1) (c) a storage room for longer-term storage and larger equipment;

2.2.5.3 (2) provide a dedicated built-in storage for sleeping mats adjacent to the sleeping area, personal storage for children and staff, a variety of wall cabinets and shelves, floor units and open visible storage;

2.2.5.3 (3) provide storage space for parent-owned strollers and for car seats left for a return trip in another vehicle;

2.2.5.3 (4) all storage will be designed to address seismic safety concerns by ensuring that all furnishings greater than 1.22 metres high, heavy cupboards and other furniture items are fixed to the wall;

2.2.5.3 (5) various distinct storage measures are required, however, depending on the layout, it may be possible to combine some of these. For the required total areas of storage in each Group, refer to Sections 3.1, 3.2, 3.3, and 3.4;

2.2.5.4 Children’s Washroom and Diapering Area

2.2.5.4 (1) the Toddler, Preschooler, and Preschool Groups will have a children's washroom for each Group immediately accessible from the cubby and activity areas. Staff will be able to visually supervise the entrance to the washroom from the main activity area;

2.2.5.4 (2) in the Infant and Toddler program, the children's toilets will be unscreened. For Preschool and Preschooler Groups, there will be one partially screened toilet. Do not provide a urinal. The number of fixtures must conform to the licensing regulations;

2.2.5.4 (3) for additional requirements for children's washrooms and diaper changing areas, refer to the Childcare Centre Room Data Sheets;

2.2.5.5 Accessible Staff Washroom

2.2.5.5 (1) provide one individual accessible staff washroom with one toilet and a sink. One toilet room is required for up to 25 staff members. Provision of an accessible shower within the staff washroom is required for staff end-of-trip facilities and care of the disabled. This washroom will be large enough to permit assisted toileting and special physical care of disabled children. A change table is to be provided. One staff washroom may be shared by two or more Groups;

2.2.5.6 Parents' Room

2.2.5.6 (1) provide a small, separate room for parents as a resource room for reading, staff/parent conferences, or breast-feeding. It will be private from the program areas and separate from the staff office. One parent room may be shared by two or more Groups;

2.2.5.7 Staff Offices

2.2.5.7 (1) provide staff offices for administrative activities, private interviews, and meetings, and as a refuge during staff breaks. The offices will be within hearing range of the primary activity areas. Visual supervision of the primary activity areas from the office by means of a window or door is preferred but not required;

2.2.5.7 (2) a single staff office may be shared by two or more Groups if it is easily accessible to each Group and if a staff room is provided. Refer to the Childcare Centre Room Data Sheets for staff room requirements;

2.2.5.7 (3) it is preferred that the Design-Builder arrange the layout of shared staff facilities to create a clustered staff area comprised of a staff office, staff room, and an accessible staff washroom;

2.2.5.8 Laundry / Janitorial Area

2.2.5.8 (1) provide a lockable laundry area with a floor sink, storage shelves, and impervious wall coverings within the Childcare Centre. A washer, dryer, and folding counter will be provided. One laundry area may be shared by two or more Groups. The laundry area is not required to be wheelchair accessible;

2.2.5.8 (2) provide a lockable janitorial room with floor sink, space for storing buckets, mops, brooms, vacuum, ladder, supplies for cleaning, shelves for paper products, light bulbs, and other janitorial supplies. It is preferred but not required to have two separate rooms for laundry and janitorial;

2.2.5.8 (3) refer to the Childcare Centre Room Data Sheets for laundry / janitorial area requirements;

2.2.5.9 Shared Support Spaces

2.2.5.9 (1) as four Groups are located together, provide additional shared support spaces. Support spaces will provide for central bulk storage, longer-

term storage, circulation, garbage collection, reception, and janitorial functions. Space gained from sharing staff office, accessible staff washroom, and parent rooms may be devoted to the above noted spaces.

2.2.6 Exit / Entry Security

The Design-Builder will provide exit/entry security that complies with the following requirements:

2.2.6.1 design the entry to facilitate supervision and security and to provide a welcoming reception;

2.2.6.2 an individual will not be required to pass through one Group's indoor space to access another Group’s indoor space;

2.2.6.3 for security and programming reasons, each entry will be directly from the covered outdoor play space; and

2.2.6.4 the preferred entry sequence is via the cubby area and from there to the primary activity space. This arrangement minimizes tracking wet and dirt inside.

2.2.7 Corridors

The Design-Builder will:

2.2.7.1 avoid use of corridors as they block visual communication for both children and staff. Most support spaces will open directly into activity areas;

2.2.7.2 avoid long, harshly lit, institutional hallways. Partial walls to delineate a circulation path may be necessary; and

2.2.7.3 provide access to all childcare Groups within the Childcare Centre to permit visiting of siblings, occasional use of each other's program spaces, staff sharing and support.

2.2.8 Mechanical and Electrical

The Design-Builder will:

2.2.8.1 provide a separate, lockable mechanical and electrical rooms to safely accommodate items such as hot water tanks, sprinkler trees, electrical panels, data, telephone and security equipment panels, gas, water or hydro meters, and any other mechanical or electrical equipment that needs to be accommodated within the Childcare Centre. Access to these rooms will not be through nap rooms, nor will any equipment be located in nap room ceiling spaces. Mechanical units (i.e. fan coil units, etc.) shall not be located in the ceilings in nap rooms.

2.2.9 Millwork

2.2.9.1 Specific millwork is needed for specific functions. See Childcare Centre Room Data Sheets for specific millwork in each room. Refer to Section 4.3 – Millwork Reference for typical dimensions. Alternative creative solutions to the ones proposed in Section 4.3 – Millwork Reference will be considered, but are not to proceed without prior discussion and acceptance by the Owner and the City Childcare Group (as defined in Schedule 2 of the Agreement).

2.3 OUTDOOR DESIGN REQUIREMENTS

2.3.1 Environment

2.3.1.1 A high quality and large outdoor play area is necessary to provide opportunities for adventure, challenge and wonder in as natural an environment as possible. All children spend some time outdoors every day regardless of the weather. The more time children spend outdoors, the lower the incidence rate of sickness.

2.3.1.2 The outdoor play space will have a favourable microclimate (i.e. wind protection and direct sunlight), have a rich range of materials and settings including contact with the living natural world, and be safe and secure. The design will allow for the safe exposure of children to natural elements and sun, wind, rain, plants, and water.

2.3.1.3 The outdoor play space will include a covered area and an uncovered area to accommodate the various outdoor activities. Between one-third and one-half of the outdoor area will be clear space for group activities and physical movement.

2.3.1.4 Since open areas can be taken over by riding toys unless other opportunities are provided, a paved path or route for wheeled toys will wind around other activity areas.

2.3.1.5 Children will be free to move from activity to activity outdoors as they are indoors without disrupting activities in activity zones.

2.3.1.6 The Design-Builder will ensure that outdoor space will be acoustically buffered from traffic and parking and other disruptive noises, fumes and odours. Particular attention will be given to the building's mechanical equipment and vents. Locate the Childcare Centre outdoor space to reduce noise from children disturbing adjacent uses.

2.3.1.7 Wind effects are one of the major drawbacks in the use of above grade roof or deck areas for outdoor play. These impacts will be mitigated through design techniques such as fences, screens, and deflectors. The Design-Builder will select and install vegetation and play equipment to be wind resistant. Awnings, if provided, will be retractable or designed to resist the wind.

2.3.1.8 For sunlight requirements, see Section 2.1.4 Sunlight, Natural Light, and Provision of Shade.

2.3.1.9 Since the outdoor play space is located on a roof, the Design-Builder will ensure that play space will be free of skylights, roof vents and/or other mechanical equipment. If an access panel is located in a child-accessible area, the panel must have smooth, rounded and eased edges, and be tamper-proof. The roof structure must be designed to carry the weight of play space elements and landscaping, particularly sand, soil, and play equipment. Large play equipment and planters or massed plantings may have to be specially placed. Locate heavy items over beams and columns. Use light weight soil, equipment, and surfacing (e.g. rubber mat impact protection under play equipment).

2.3.1.10 The Design-Builder will provide anchorage for all planting and play equipment against the wind, and normal use. It is better to plan and prepare for anchorage points during construction. Use smaller play equipment to reduce weight and wind effects. Design anchorage to retain integrity of roof membranes (e.g. some play equipment can be anchored at any location into an 89 millimetre thick concrete topcoat).

2.3.1.11 The Design-Builder will protect against future roof leakage.

2.3.1.12 The Design-Builder will provide sectional play elements that allow for incremental roof repair and a redundant roof layer for extra protection.

2.3.1.13 Safety is a primary concern as roof decks are a more hazardous environment. The Design-Builder will locate higher equipment at the centre of the deck, use rubber matting under equipment, anchor all equipment and use non-slip surfaces.

2.3.2 Activity Zones

The Design-Builder will:

2.3.2.1 organize outdoor space to offer specific activity zones for exploration by the children.

2.3.2.2 divide the outdoor play area into play zones, as follows:

2.3.2.2 (1) Covered Play Area - This is a transition zone from the indoors to the outside and will be located adjacent to the entry. This zone is intended for quiet or concentrated activities such as painting/art, clay/water table, outdoor meals and for active play on rainy days. It is also used for napping in Infant programs;

2.3.2.2 (2) Creative Zone - This will be located near the indoors and may be part of covered area. Activities in this zone may include carpentry and art projects that are messy and/or noisy;

2.3.2.2 (3) Fantasy Zone - This area will be near the covered play area, the Social Zone, and the Dramatic Zone. This zone provides for play either standing or sitting and encourages projective and fantasy play. Activity areas will include sand, water table, water source, table, and other small toys as well as storage for these play props;

2.3.2.2 (4) Social Zone - This area will provide a quiet place to sit, tell and listen to stories, talk with staff or friends in a central location which is shady in summer and sunny in winter;

2.3.2.2 (5) Dramatic Zone - A place to play "house" and dress-up will be provided. This zone provides for symbolic and parallel play and for associative and co-operative activities. Space will be provided for a house setting, props and utensils, large blocks, and interlocking construction toys. The wheeled toy route to extend can into this area;

2.3.2.2 (6) Physical Zone - An area with stationary equipment for balancing, climbing, sliding, and swaying will be provided. Equipment will be designed to provide graduated challenges for each age group. This zone will be located away from quieter zones but adjacent to the Dramatic Zone. Physical development can also be promoted through the use of mounds, boulder clusters, paths for wheeled toys and other features throughout the outdoor setting; and

2.3.2.2 (7) Natural Element Zone - natural elements will be included everywhere to provide an experience of nature including vegetable plots, fragrant flowers, soil for digging, animal hutches, sand, water, trees and shrubs, and wind toys such as sails or banners.

2.3.3 Landscaping

The Design-Builder:

2.3.3.1 will provide significant areas of soft landscaping will be provided in all outdoor play yards whether above grade or on grade. Natural features and vegetation are important. This will include grassed areas, shrubs, massed planting, trees, and planters. Use wind tolerant and draught resistant landscape planting (small soil pockets dry out quickly). Toxic plants are not permitted and plants with thorns must also be avoided in or near areas where children will play;

2.3.3.2 will ensure that in all cases, the outdoor space will offer a variety of surfaces and terrains;

2.3.3.3 since the outdoor play space is located on a roof structure, it is critical that the roof will be designed to permit substantial areas of landscaping to be supported. Provision will be made to support lawn areas with the soil depth required for healthy growth of grass. All vegetation will be irrigated. A hose bib will be provided for watering purposes; it would also be useful to support sand play and water play by filling wading pools or operating a sprinkler to run through on a hot day;

2.3.3.4 will provide a resilient fall surface, as approved by the public health inspector, at all places where children can climb, slide, or fall. Assume that children will climb everywhere possible;

2.3.3.5 will contain loose materials such as “Fibar” with curbs or planters, surrounded by wooden decking or with other edging solutions. Areas of loose materials will be separated from the entry to indoors by an expanse of paving which can be swept clean periodically;

2.3.3.6 will provide drainage. Clean outs will be accessible and have catch basins. Provide 2 percent slope to drain at hard surfaces and greater for other surfaces. Wood decking drains well, while artificial turf traps water and freezes. For additional drainage requirements, see Section 4.2.13.3 – Plumbing;

2.3.3.7 will provide an automatic watering system with soil sensors. (Timed equipment often overwaters plants causing failure.); and

2.3.3.8 may use plant boxes can serve as dividers and climbing structures. Also provide plant boxes for vegetables and flowers and one grassed area within the Infant outdoor area for picnics and lying about.

2.3.4 Fences and Boundaries

2.3.4.1 The Design-Builder will ensure that the boundaries of the outdoor space are secure and visible from many vantage points within the space to allow for supervision of children. Fences will be provided of a height and material strength to prevent children from getting out of the yard and strangers from reaching or climbing into the yard. Refer to Section 4.2.4 for additional fencing requirements. It is also desirable for the outdoor play space to be visible from the indoors within the primary activity space. Vision panels in perimeter safety rails and fences around above-grade play yards will be provided to discourage climbing. The fencing must be set back from the edge to minimize vertigo. All fences will be designed to not be climbable.

2.3.4.2 The Design-Builder will develop the outdoor play area as a fenced, private space.

2.3.5 Outdoor Storage

2.3.5.1 The area required for exterior storage is part of the outdoor space requirement. See Sections 3.1, 3.2, 3.3, and 3.4 for exterior storage areas shown in area tables. For specific requirements, see the Childcare Centre Room Data Sheets for Exterior Storage for each Group.

2.3.5.2 Convenient and secure storage is key to the regular use and maintenance of outdoor play equipment. The Design-Builder will ensure that the storage area is protected from rain and wind to prevent equipment from rusting or getting waterlogged and dirty. It will be securely locked to prevent unauthorized entry.

2.3.5.3 The Design-Builder will ensure that storage allows for outdoor toys, wheeled vehicles, play equipment and maintenance equipment to be stored in a convenient fashion for easy access. All storage will be secure from unsupervised entrance by children and outfitted with hooks, bins, and shelving.

2.3.5.4 The Design-Builder will provide storage such that maintenance and landscaping material and equipment is stored separately from program equipment.

2.3.5.5 The Design-Builder will provide storage for:

2.3.5.5 (1) small toys using adjustable shelving and bins;

2.3.5.5 (2) for push toys, tricycles, balls, and other outdoor toys; and

2.3.5.5 (3) for large items such as carts, wading pools, hoses, balance beams, and sand box covers.

2.3.6 Relationship to Indoor Space

2.3.6.1 Outdoor space will be at the same level as the indoor space (plus or minus 0.5 metres) and contiguous with it. The Design-Builder will plan the two areas together. The Design-Builder will provide ramps for wheeled equipment when a level change exists, and protect the area against flooding.

2.3.6.2 The Design-Builder will ensure a strong visual connection exists between the indoor and outdoor activity areas.

2.3.6.3 The Design-Builder will ensure that the indoor and outdoor spaces allow for inter-related indoor and outdoor activities and free movement by children. The Childcare Centre will be oriented to facilitate the surveillance of outdoor play areas from the primary indoor activity area.

2.3.7 Shared Outdoor Space

2.3.7.1 When several Groups share an outdoor area, the Design-Builder will provide designated areas to support age-appropriate play for each Group. This will facilitate supervision and control and minimize use conflicts among children of different ages.

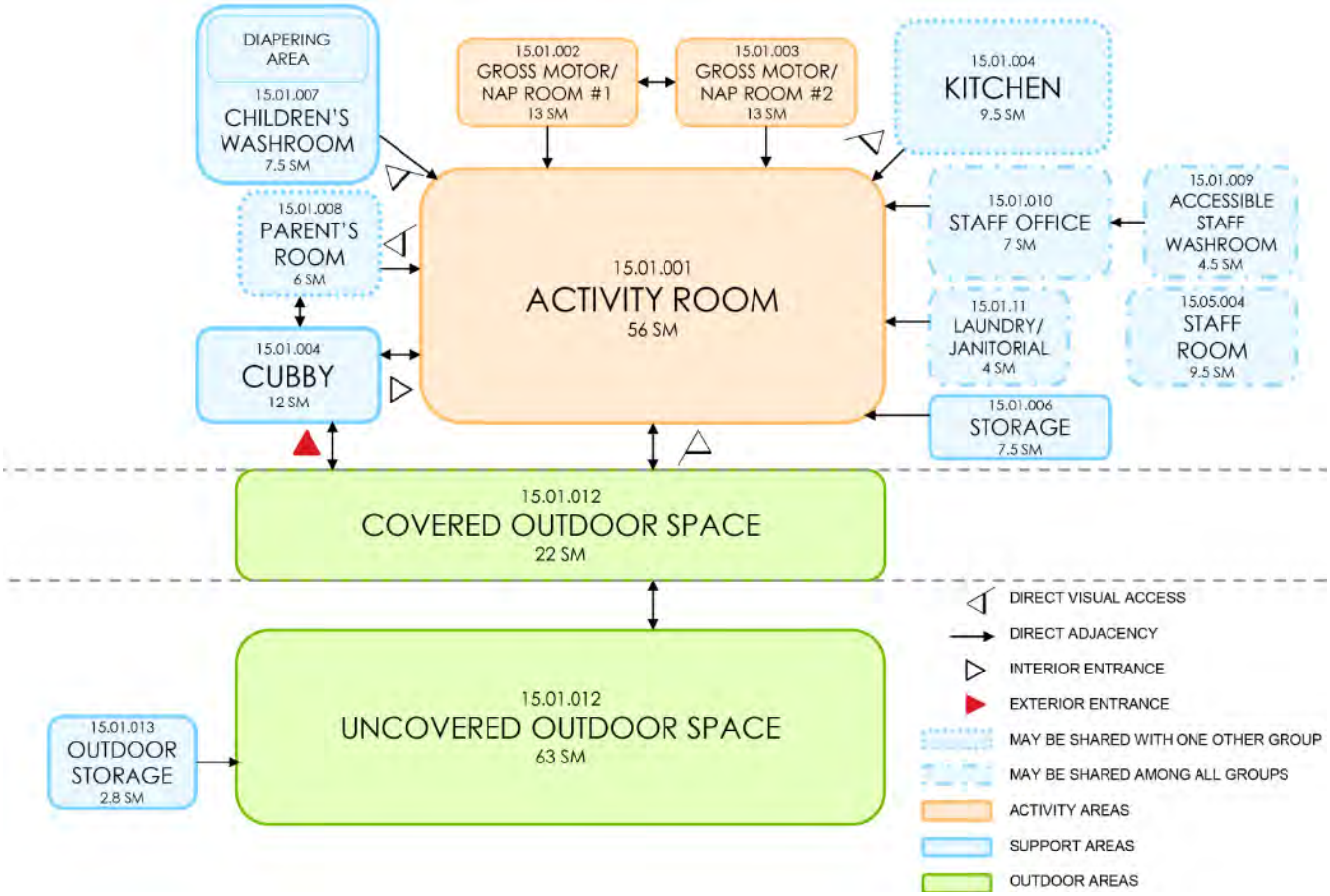
SECTION 3 - CHILDCARE COMPONENT REQUIREMENTS

3.1 INFANT GROUP DAYCARE

3.1.1 Description

3.1.1.1 The Infant Group daycare is a fully furnished and equipped component of the Childcare Centre which provides full time care to 12 children under 18 months of age.

3.1.2 Space Relation and Adjacency Diagram



Space Relation and Adjacency Diagram 2: Infant Group Daycare

3.1.3 Indoor Space

The Design-Builder will ensure that the indoor space for the Infant Group complies with the following requirements:

3.1.3.1 Activities in Infant Group Daycare

3.1.3.1 (1) for the general requirements and information about activity settings, see Section 2.2.1– Activity Settings. Table 2 lists the minimum number of activity settings for Infant Group daycare:

Table 2: Activity Settings for Infant Group Daycare

Minimum Number of Settings	Types of Activities
7	Art – Sensory / Dramatic play / Manipulative Toy
2	Quiet Reading Settings
2	Climbing and Crawling

3.1.3.1 (2) the Childcare Centre will accommodate activity settings in the following discrete spaces: The activity room, the gross motor/nap room, and the quiet room. The gross motor/nap room will be designed to open to the activity room to enable shared use and to enhance flexibility;

3.1.3.2 Special Infant Group Daycare Requirements

3.1.3.2 (1) the entry sequence for Infant Group Daycare will be via the cubby area and from there to the primary activity space. This arrangement minimizes tracking wet and dirt into the Childcare. This is important in Infant programs where children spend much of their time on the floor;

3.1.3.2 (2) the Infant Group Daycare will have two smaller rooms for napping so that fussy Infants do not disturb sleeping Infants. These rooms can accommodate more than one activity and will both open to the primary activity space;

3.1.3.3 Storage

3.1.3.3 (1) the Childcare Centre will provide storage space for parent-owned strollers and for car seats left for a return trip in another vehicle;

3.1.3.3 (2) separate and distinct from parent-owned stroller storage, there will be a storage space for two (2) 3-position strollers in Infant Group Daycare near the Infant cubbies. The size of stroller is 1.9 metre long by 0.6 metre wide by 1 metre high. Ensure circulation space from entrance to stroller storage accommodates the turning radius of the stroller;

3.1.3.4 Controlled Access

3.1.3.4 (1) Specific areas require controlled access for children, by way of a half-height gate or door. These are:

3.1.3.4 (1) (a) Infant washroom: gated;

3.1.3.4 (1) (b) kitchen at Infant Group: gated; and

3.1.3.4 (1) (c) cubbies at Infant Group: gated;

3.1.3.5 Washrooms

3.1.3.5 (1) in the Infant program the children's toilets will be unscreened;

3.1.3.6 Indoor Area Breakdown and Description

Table 3: Indoor Area Breakdown and Description – Infant Group Daycare

Room #:	**Infant Group Daycare (12 Children)**	Quantity	Minimum NSM	Minimum Total NSM	Notes:
	Indoor Activity Spaces				
15.01.001	Activity Room Table and Art Area – 11 SM Reading, Cozy Corner – 8 SM Open Area for Other Activity Settings – 37 SM	1	56	56	
15.01.002	Gross Motor/Nap Room #1	1	13	13	
15.01.003	Gross Motor/Nap Room #2	1	13	13	
	Net Activity Area			**82**	
	Support Spaces				
15.01.004	Cubby	1	12	12	
15.01.005	Kitchen*	1	9.5	9.5	Can be shared with another Group. In this case the total area will be at least 12 SM.
15.01.006	Storage	1	7.5	7.5	
15.01.007	Children's Washroom	1	7.5	7.5	

Room #:	Infant Group Daycare (12 Children)	Quantity	Minimum NSM	Minimum Total NSM	Notes:
15.01.008	Parent's Room**	1	6	6	Can be shared with other Groups.
15.01.009	Accessible Staff Washroom**	1	4.5	4.5	Can be shared with other Groups.
15.01.010	Staff Office***	1	7	7	Can be shared with other Groups. If shared, a staff room will be provided too.
15.01.011	Laundry/Janitorial**	1	4	4	Can be shared with other Groups.
	Net Support Area		**58**	**58**	
INDOOR AREA TOTAL, INFANTS			**Minimum**	**140.0 NSM 182.0 GSM**	**Net to gross ratio=1 to 1.3**

* If kitchen is shared by two (2) Groups the total kitchen area will be at least 12 SM.

** The noted support spaces may be shared by more than one Group, but no reduction in total area will occur. The area gained from sharing may be required for garbage collection, janitorial, reception/waiting, central storage and circulation, depending on proposed layout.

*** If a single office is shared by two (2) or more Groups a staff room will also be provided. See the Childcare Centre Room Data Sheets for staff room requirements.

3.1.4 Outdoor Space

The Design-Builder will ensure that the outdoor space for the Infant Group complies with the following requirements:

3.1.4.1 Infant Group Outdoor Areas Requirements

3.1.4.1 (1) refer to Section 2.3 – Outdoor Design Requirements for the general criteria on the Group outdoor areas;

3.1.4.1 (2) covered play area is a transition zone from the indoors to the outside and will be located adjacent to the entry. This zone is intended for quiet or concentrated activities such as painting/art, clay/water table, outdoor meals and for active play on rainy days. It is also used for napping in Infant programs;

3.1.4.2 Outdoor Area Breakdown and Description

Table 4: Outdoor Area Breakdown and Description – Infant Group Daycare

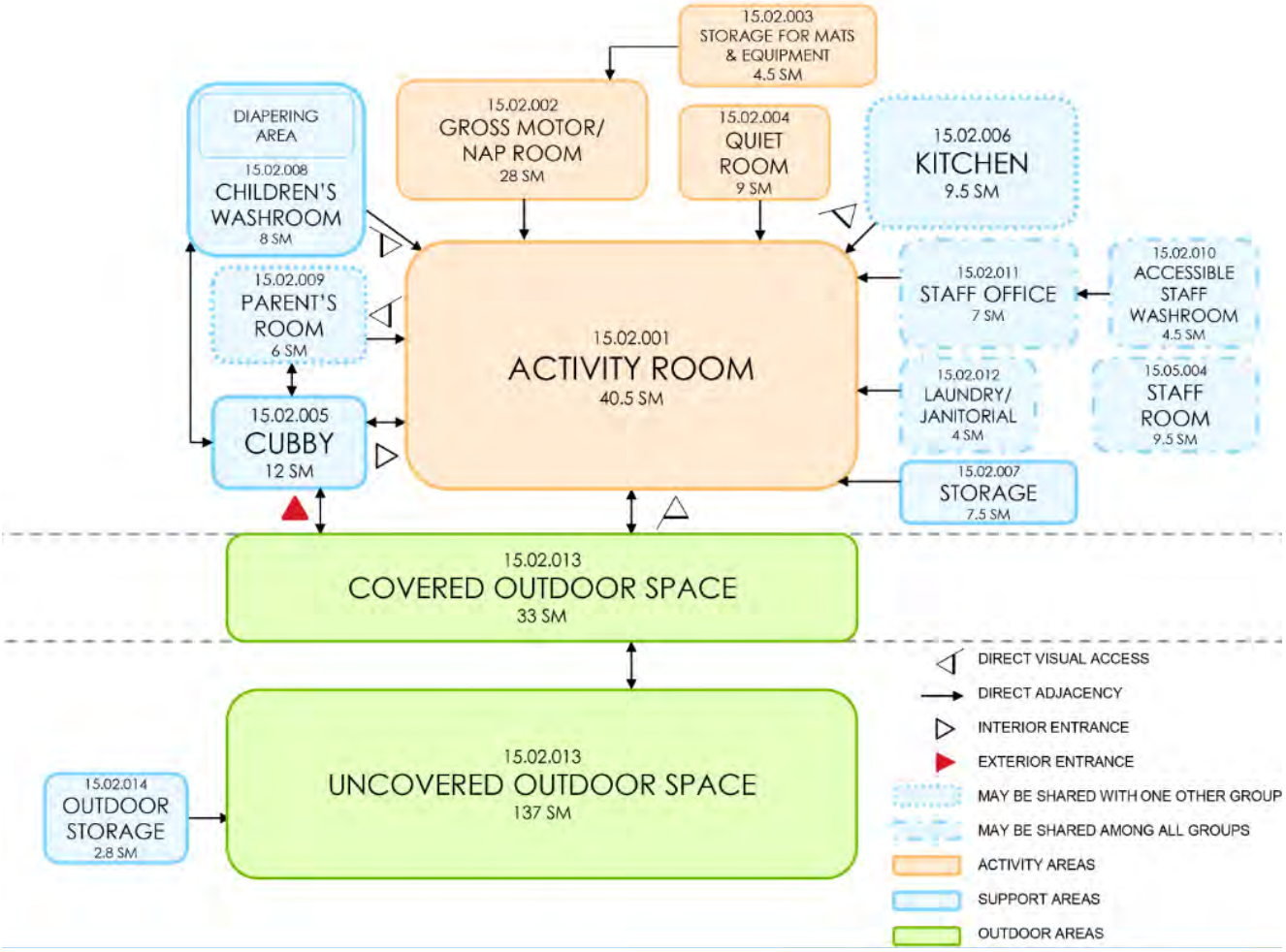
Room #:	**Infant Group Daycare Outdoor Areas**	Covered Outdoor Space SM	Uncovered Outdoor Space SM	Total Outdoor Space SM	Notes:
15.01.012	Outdoor Space Infant	22	63	85	
OUTDOOR AREA TOTAL, INFANTS				**85 NSM**	
Room #:	**Infant Group Daycare Outdoor Storage**	Quantity	Minimum NSM	Minimum Total NSM	Notes:
15.01.013	Outdoor Storage	1	2.8	2.8	
OUTDOOR STORAGE TOTAL, INFANTS				**2.8 NSM**	

3.2 TODDLER GROUP DAYCARE

3.2.1 Description

3.2.1.1 The Toddler Group daycare is a fully furnished and equipped component of the Childcare Centre which provides full time care to 12 children between 18 to 36 months of age.

3.2.2 Space Relation and Adjacency Diagram



Space Relation and Adjacency Diagram 3: Toddler Group Daycare

3.2.3 Indoor Space

The Design-Builder will ensure that the indoor space for the Toddler Group complies with the following requirements:

3.2.3.1 Activities in Toddler Group Daycare

3.2.3.1 (1) refer to Section 2.2.1 – Activity Settings for the general requirements and information about activity settings. Table 5 lists the minimum number of activity settings for Toddler Group daycare;

Table 5: Activity Settings for Toddler Group Daycare

Minimum Number of Settings	Types of Activities
8	Art Water, Sand, Sensory Reading Dramatic Play Blocks Puzzles and Manipulative Toys Gross Motor, Movement Quiet Retreat for 1-2 children

3.2.3.1 (2) the Childcare Centre will accommodate activity settings in the following discrete spaces: The activity room, the gross motor/nap room, and the quiet room. The gross motor/nap room and the quiet room will be designed to open to the activity room to enable shared use and to enhance flexibility;

3.2.3.2 Special Toddler Group Daycare Requirements

3.2.3.2 (1) parents of Toddlers will enter through the cubby area so that shoes can be removed before entering areas where children are playing on the floor;

3.2.3.3 Storage

3.2.3.3 (1) the Childcare Centre will provide storage space for parent-owned strollers and for car seats left for a return trip in another vehicle;

3.2.3.3 (2) there will be a storage space for two 3-position strollers in the Toddler Group daycare near the Toddler cubbies. The size of the stroller is 1.9 metres long by 0.6 metres wide by 1 metres high. Ensure circulation space from entrance to stroller storage accommodates the turning radius of the stroller;

3.2.3.4 Controlled Access

3.2.3.4 (1) specific areas require controlled access for children, by way of a half-height gate or door. These are:

3.2.3.4 (1) (a) Toddler washroom: gated;

3.2.3.4 (1) (b) kitchen at Toddler Group: gated; and

3.2.3.4 (1) (c) cubbies at Toddler Group: gated;

3.2.3.5 Washrooms

3.2.3.5 (1) for the Toddler Group daycare, provide a children's washroom immediately accessible from the cubby and activity areas. Staff will be able to visually supervise the entrance to the washroom from the main activity area.

3.2.3.6 Indoor Area Breakdown and Description

Table 6: Indoor Area Breakdown and Description – Toddler Group Daycare

Room #:	**Toddler Group Daycare (12 Children)**	Quantity	Minimum NSM	Minimum Total NSM	Notes:
	Indoor Activity Spaces				
15.02.001	Activity Room Art Area - 9 SM Table Area - 11 SM Other Activity Settings - 20.5 SM	1	40.5	40.5	
15.02.002	Gross Motor/Nap Room	1	28	28	
15.02.003	Storage for Mats & Equipment	1	4.5	4.5	
15.02.004	Quiet Room	1	9	9	
	Net Activity Area			**82**	
	Support Spaces				
15.02.005	Cubby	1	12	12	
15.02.006	Kitchen*	1	9.5	9.5	Can be shared with another Group. In this case the total area will be at least 12 SM.
15.02.007	Storage	1	7	7	
15.02.008	Children's Washroom	1	8	8	

Room #:	Toddler Group Daycare (12 Children)	Quantity	Minimum NSM	Minimum Total NSM	Notes:
15.02.009	Parent's Room**	1	6	6	Can be shared with other Groups.
15.02.010	Accessible Staff Washroom**	1	4.5	4.5	Can be shared with other Groups.
15.02.011	Staff Office***	1	7	7	Can be shared with other Groups. If shared, a staff room will be provided too.
15.02.012	Laundry/Janitorial**	1	4	4	Can be shared with other Groups.
	Net Support Area	1	58	58	
TOTAL, Toddler Group Daycare			**Minimum**	**140.0 NSM 182.0 GSM**	**Net to gross ratio = 1 to 1.3**

* If kitchen is shared by two (2) Groups the total kitchen area will be at least 12 SM.

** The noted support spaces may be shared by more than one Group, but no reduction in total area will occur. The area gained from sharing may be required for garbage collection, janitorial, reception/waiting, central storage and circulation, depending on proposed layout.

*** If a single office is shared by two (2) or more Groups a staff room will also be provided. See the Childcare Centre Room Data Sheets for staff room requirements.

3.2.4 Outdoor Space

The Design-Builder will ensure that the outdoor space for the Toddler Group complies with the following requirements:

3.2.4.1 Toddler Group Outdoor Area Requirements

3.2.4.1 (1) refer to Section 2.3 – Outdoor Design Requirements for the general criteria on the Group outdoor areas.

3.2.4.2 Outdoor Area Breakdown and Description

Table 7: Outdoor Area Breakdown and Description – Toddler Group Daycare

Room #:	Toddler Group Daycare Outdoor Areas	Covered Outdoor Space SM	Uncovered Outdoor Space SM	Total Outdoor Space SM	Notes:
15.02.013	Outdoor Space Toddler	33	137	170	

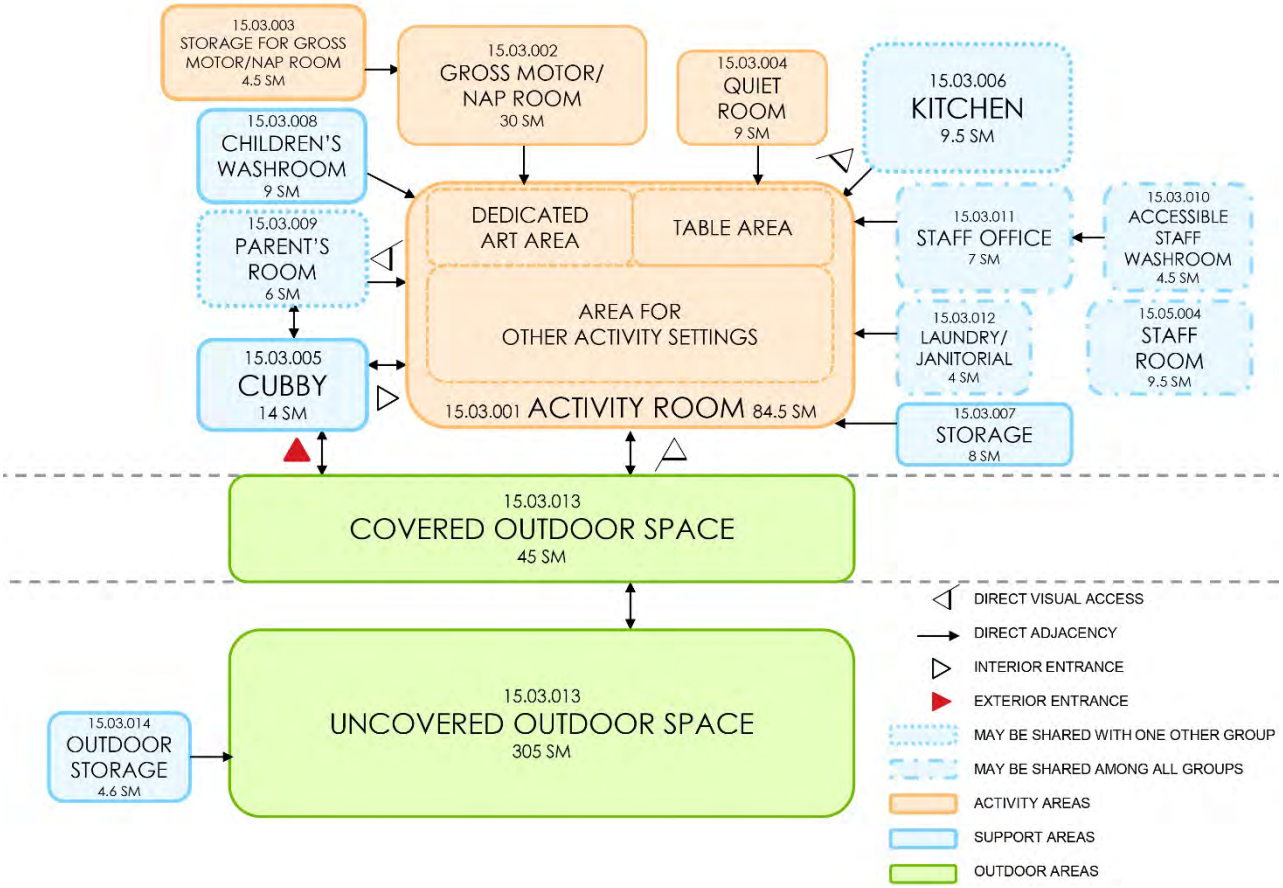
OUTDOOR AREA TOTAL, TODDLER				**170 NSM**	
Room #:	**Toddler Group Daycare Outdoor Storage**	Quantity	Minimum NSM	Minimum Total NSM	Notes:
15.02.014	Outdoor Storage	1	2.8	2.8	
OUTDOOR STORAGE TOTAL, TODDLER				**2.8 NSM**	

3.3 PRESCHOOLER GROUP DAYCARE

3.3.1 Description

3.3.1.1 The Preschooler Group daycare is a fully furnished and equipped component of the Childcare Centre which provides full time care to 25 children between 2 ½ and 5 years of age.

3.3.2 Space Relation and Adjacency Diagram



Space Relation and Adjacency Diagram 4: Preschooler Group Daycare

3.3.3 Indoor Space

The Design-Builder will ensure that the indoor space for the Preschooler Group complies with the following requirements:

3.3.3.1 Activities in Preschooler Group Daycare

3.3.3.1 (1) refer to Section 2.2.1 – Activity Settings for the general requirements and information about activity settings. Table 8 lists the minimum number of activity settings for Preschooler Group daycare:

Table 8: Activity Settings for Preschooler Group Daycare

Minimum Number of Settings	Types of Activities
12	Art Water Sand/Texture Dramatic Play Science Puzzles and Games Manipulative Toys Blocks Gross Motor, Circle Reading Wheeled and Construction Toys Quiet Retreat for 1-2 children

3.3.3.1 (2) the Childcare Centre will accommodate activity settings in the following discrete spaces: The activity room, the gross motor/nap room, and the quiet room. The gross motor/nap room and the quiet room will be designed to open to the activity room to enable shared use and to enhance flexibility;

3.3.3.2 Controlled Access

3.3.3.2 (1) Specific areas require controlled access for children, by way of a half-height gate or door. These are:

3.3.3.2 (1) (a) Preschooler washroom: open;

3.3.3.2 (1) (b) kitchen at Preschooler Group: gated; and

3.3.3.2 (1) (c) cubbies at Preschooler Group: gated;

3.3.3.3 Indoor Area Breakdown and Description

Table 9: Indoor Area Breakdown and Description – Preschooler Group

Room #:	**Preschooler Group Daycare (25 Children)**	Quantity	Minimum NSM	Minimum Total NSM	Notes:
	Indoor Activity Spaces				
15.03.001	Activity Room Dedicated Art Area (wet messy) – 10 SM Table Area – 14 SM Area for other Activity Settings – 60.5 SM	1	84.5	84.5	
15.03.002	Gross Motor/Nap Room	1	30	30	
15.03.003	Storage for Gross Motor/Nap Room	1	4.5	4.5	
15.03.004	Quiet Room	1	9	9	
	Net Activity Area			**128**	
	Support Spaces				
15.03.005	Cubby	1	14	14	
15.03.006	Kitchen*	1	9.5	9.5	Can be shared with another Group. In this case the total area will be at least 12 SM.
15.03.007	Storage	1	8	8	
15.03.008	Children's Washroom	1	9	9	
15.03.009	Parent's Room**	1	6	6	Can be shared with other Groups.
15.03.010	Accessible Staff Washroom	1	4.5	4.5	Can be shared with other Groups.
15.03.011	Staff Office***	1	7	7	Can be shared with other Groups. If shared, a staff room will be provided too.

Room #:	Preschooler Group Daycare (25 Children)	Quantity	Minimum NSM	Minimum Total NSM	Notes:
15.03.012	Laundry/Janitorial**	1	4	4	Can be shared with other Groups.
	Net Support Area		62	62	
TOTAL, Preschooler Group Daycare			**Minimum**	**190.0 NSM 247.0 GSM**	**Net to gross ratio = 1 to 1.3**

* If kitchen is shared by two (2) Groups the total kitchen area will be at least 12 SM.

** The noted support spaces may be shared by more than one Group, but no reduction in total area will occur. The area gained from sharing may be required for garbage collection, janitorial, reception/waiting, central storage and circulation, depending on proposed layout.

*** If a single office is shared by two (2) or more Groups a staff room will also be provided. See the Childcare Centre Room Data Sheets for staff room requirements.

3.3.4 Outdoor Space

The Design-Builder will ensure that the outdoor space for the Preschooler Group complies with the following requirements:

3.3.4.1 Preschooler Group Outdoor Area Requirements

3.3.4.1 (1) refer to Section 2.3 - Outdoor Design Requirements for the general criteria for Group outdoor areas.

3.3.4.2 Outdoor Area Breakdown and Description

Table 10: Outdoor Area Breakdown and Description – Preschooler Group

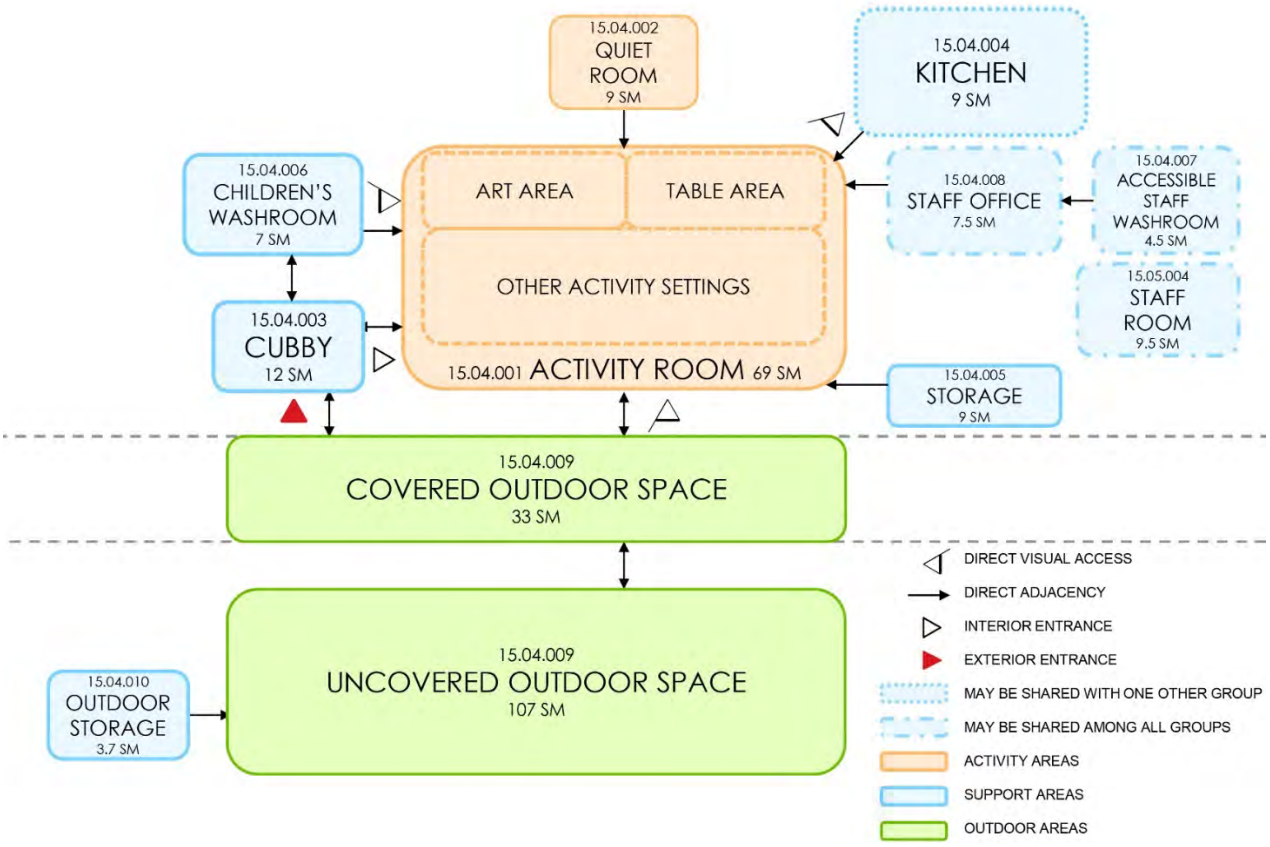
Room #:	**Preschooler Group Daycare Outdoor Areas**	Covered Outdoor SM	Uncovered Outdoor SM	Total Outdoor SM	Notes:
15.03.013	Outdoor Space Preschooler	45	305	350	
OUTDOOR AREA TOTAL, PRESCHOOLER				**350 NSM**	
Room #:	**Preschooler Group Daycare Outdoor Storage**	Quantity	Minimum NSM	Minimum Total NSM	Notes:
15.03.014	Outdoor Storage	1	4.6	4.6	
OUTDOOR STORAGE TOTAL, PRESCHOOLER				**4.6 NSM**	

3.4 PRESCHOOL PART-DAY PROGRAM

3.4.1 Description

3.4.1.1 The Preschool program is a part-day service with 20 spaces for children 3-5 years old. Children attend either morning or afternoon sessions of 2 to 3 hours each session.

3.4.2 Space Relation and Adjacency Diagram



Space Relation and Adjacency Diagram 5: Preschool

3.4.3 Indoor Space

The Design-Builder will ensure that the indoor space for the Preschool Group complies with the following requirements:

3.4.3.1 Activities in Preschool Part-Day Program

3.4.3.1 (1) for the general requirements and information about activity settings, see Section 2.2.1 – Activity Settings. Table 11 lists the minimum number of activity settings for Preschool program:

Table 11: Activity Settings for Preschool Group

Minimum Number of Settings	Types of Activities
12	Art Water Sand/Texture Dramatic Play Science Puzzles and Games Manipulative Toys Blocks Gross Motor, Circle Reading Wheeled and Construction Toys Quiet Retreat for 1-2 children

3.4.3.1 (2) the Childcare Centre will accommodate activity settings in the following discrete spaces: the activity room, the gross motor/nap room, and the quiet room. The gross motor/nap room and the quiet room will be designed to open to the activity room to enable shared use and to enhance flexibility.

3.4.3.2 Controlled Access

3.4.3.2 (1) Specific areas require controlled access for children, by way of a half-height gate or door. These are:

3.4.3.2 (1) (a) Preschool washroom: open;

3.4.3.2 (1) (b) kitchen at Preschool Group: open; and

3.4.3.2 (1) (c) cubbies at Preschool Group: open;

3.4.3.3 Washrooms

3.4.3.3 (1) a children's washroom will be provided for the Preschool Group immediately accessible from the cubby and activity areas. Staff will be able to visually supervise the entrance to the washroom from the main activity area. One partially screened toilet will be provided;

3.4.3.4 Indoor Area Breakdown and Description

Table 12: Indoor Area Breakdown and Description - Preschool

Room #:	**Preschool Space List (20 Children)**	Quantity	Minimum NSM	Minimum Total NSM	Notes:
	Indoor Activity Spaces				
15.04.001	Activity Room Art Area - 7.5 SM Table Area - 14.0 SM Other Activity Settings - 47.5 SM	1	69	69	
15.04.002	Quiet Room	1	9	9	
	Net Activity Area			**78**	
	Support Spaces				
15.04.003	Cubby	1	12	12	
15.04.004	Kitchen*	1	9	9	Can be shared with another Group. In this case the total area will be at least 12 SM.
15.04.005	Storage	1	9	9	
15.04.006	Children's Washroom	1	7	7	
15.04.007	Accessible Staff Washroom**	1	7.5	7.5	Can be shared with other Groups.
15.04.008	Staff Office**	1	4.5	4.5	If shared, a staff room will be provided too.
	Net Support Area			49	
TOTAL, Preschool			**Minimum**	**127.0 NSM 165.1 GSM**	**Net to gross ratio = 1 to 1.3**

* If kitchen is shared by two (2) Groups the total kitchen area will be at least 12 SM.
** The noted support spaces may be shared by more than one Group, but no reduction in total area will occur. The area gained from sharing may be required for garbage collection, janitorial, reception/waiting, central storage and circulation, depending on proposed layout.
*** If a single office is shared by two (2) or more Groups a staff room will also be provided. See the Childcare Centre Room Data Sheets for staff room requirements.

3.4.4 Outdoor Space

The Design-Builder will ensure that the outdoor space for the Preschool Group complies with the following requirements:

3.4.4.1 Preschool Group Outdoor Areas Requirements

3.4.4.1 (1) Refer to Section 2.3 – Outdoor Design Requirements for the general criteria on Group outdoor areas.

3.4.4.2 Outdoor Area Breakdown and Description

Table 13: Outdoor Area Breakdown and Description - Preschool

Room #:	**Preschool Group Outdoor Areas**	Covered Outdoor Space SM	Uncovered Outdoor Space SM	Total Outdoor Space SM	Notes:
15.04.009	Outdoor Space Preschool	33	107	140	
OUTDOOR AREA TOTAL, PRESCHOOL				**140 NSM**	
Room #:	**Preschool Group Outdoor Storage**	Quantity	Minimum NSM	Minimum Total NSM	Notes:
15.04.010	Outdoor Storage	1	3.7	3.7	
OUTDOOR STORAGE TOTAL, PRESCHOOL				**3.7 NSM**	

SECTION 4 - TECHNICAL SUPPLEMENT

4.1 GENERAL

4.1.1 Intent

4.1.1.1 The Design-Builder will:

4.1.1.1 (1) read these technical requirements conjunction with Vancouver Coastal Health's "Design Resource for Child Care Facilities" and "Director of Licensing Standards of Practice – Safe PlaySpace";

4.1.1.1 (2) note that these technical requirements are based on content from City of Vancouver Childcare Design Guidelines – June 1993 and City of Vancouver Childcare Technical Guidelines – Jan 2019;

4.1.1.1 (3) apply the design and construction of this Childcare Centre; and

4.1.1.1 (4) note that these technical requirements are to clarify the minimum standard required by the City of Vancouver for materials, finishes, equipment, and other items.

4.1.2 Regulations and Standards

4.1.2.1 The Design-Builder will ensure that all applicable building codes, government acts and health regulations are met. These include, but are not limited to:

4.1.2.1 (1) the VBBL;

4.1.2.1 (2) the *Community Care and Assisted Living Act* (British Columbia) and Child Care Licensing Regulation; and

4.1.2.1 (3) Occupational Health and Safety Regulation (Work Safe BC).

4.1.2.2 The Design-Builder is responsible for ensuring all applicable updates or revisions to the code, act or regulations are addressed and included in the Design-Builder's work.

4.1.3 Sustainability

4.1.3.1 The Design-Builder will design and construct the Childcare Centre to achieve a minimum of 35% reduction in energy consumption compared to the VBBL (ASHRAE 90.1 2010 or NECB 2011), and reduce greenhouse gas emissions through the use of only low carbon fuel sources.

4.1.4 Universal Design

4.1.4.1 Universal design is required. For further guidelines, beyond that required by the VBBL, refer to:

4.1.4.1 (1) Supported Child Care: Enhancing Accessibility; A Resource Manual for Communities, Child Care Settings and Child Care Providers put out jointly by the governments of British Columbia and Canada.

4.1.4.1 (2) www.specialinkcanada.org, website for The National Center for Childcare Inclusion.

4.1.5 Disclaimers

4.1.5.1 Any specific products named in this document are not to be taken as an endorsement of that product, but rather as an example of a standard of quality that has proven successful in the past. Any other products that meet this level of quality will be considered for use, but their use is not to proceed without prior discussion and acceptance by the Owner in consultation with the City of Vancouver.

4.2 TECHNICAL

4.2.1 Guarantees and Warranties

4.2.1.1 For clarity, the provisions of Section 37 of the body of the Agreement apply to the Childcare Centre as well.

4.2.1.2 In general, guarantees and warranties are to be provided per the industry standard.

4.2.1.3 The Design-Builder will provide, in addition to any guarantees and warranties required in the body of the Agreement, any additional or extended guarantees or warranties set out herein.

4.2.1.4 The Design-Builder will ensure that certificates for any extended guarantee and warranties are issued to the Owner.

4.2.2 Hazardous Materials

4.2.2.1 The Design-Builder will only use materials that are free of hazardous materials, including materials such as asbestos, lead and PCBs, in the constructing and finishing of the Childcare Centre.

4.2.3 General Finish Requirements

4.2.3.1 The Design-Builder will finish all surfaces, edges, corners, and protrusions to reduce or prevent hazards to children. All corners will be rounded, edges eased, and surfaces will be smooth. Particular attention will be focused on concrete surfaces, windowsills, flashings, and laminate edges/corners.

4.2.4 Landscaping

4.2.4.1 Fences

The Design-Builder will:

4.2.4.1 (1) ensure that fencing materials for rooftop perimeter fence are unclimbable tempered and laminated glazing. Dividing fences between Groups will be unclimbable glazed panels, wooden pickets, steel fencing, or an approved alternative;

4.2.4.1 (2) refer to Sections 6.7.1.1.(4) and 6.7.14 of the Statement of Requirements for general glazing requirements, except for tempered and laminated glazing which the Design-Builder will provide for the Childcare Centre in accordance with Section 4.2.7.1(3);

4.2.4.1 (3) ensure all steel fencing are hot dipped galvanized, then primed and painted;

4.2.4.1 (4) ensure that all steel fencing will not be climbable; no gaps in fence to be larger than 100 millimetres (chain link openings to be no more than 38 millimetres);

4.2.4.1 (5) provide fences that meet the following minimum heights (all heights will be measured above any climbable permanent fixture located within 1.22 metres of the fence such as planters, benches play equipment):

- 4.2.4.1 (5) (a) 1.22 metres minimum typically;
- 4.2.4.1 (5) (b) 1.82 metres where the grade outside the fence drops by at least 0.6 metres or a down slope of greater than 45 degrees;
- 4.2.4.1 (5) (c) 2.44 metres where the grade outside the fence drops by at least 3.05 metres, for example at a roof top. 1.82 metres with an extra 0.6 metres sloping 45 degrees inwards is also acceptable; and
- 4.2.4.1 (5) (d) 1.82 metres at any pool or pond;

4.2.4.1 (6) ensure all gates are equipped with child-proof latches;

4.2.4.1 (7) ensure all gates are self-closing; and

4.2.4.1 (8) review door hardware with a Code specialist for all gates and doors along an emergency path.

4.2.4.2 Landscaped areas / playgrounds (general)

The Design-Builder will:

4.2.4.2 (1) design and construct the outdoor play areas to create a natural environment utilizing a variety of textures and natural materials;

4.2.4.2 (2) place playground equipment, such as climbers, at the edge of the play area to maximize the available outdoor open play space;

4.2.4.2 (3) not use dark colours for impervious and play surfaces to reduce heat island effects and protect children from hot surfaces;

4.2.4.2 (4) not use very light and reflective materials as they cause glare problems;

4.2.4.2 (5) ensure that all play and walking surfaces are non-slip;

4.2.4.2 (6) not use grass in areas other than Infant play areas. It cannot sustain the traffic in programs with older children unless the outdoor area is well over the minimum allowable area;

4.2.4.2 (7) ensure that plants are of a size to withstand the use of the area. Plant species will be non-toxic, vigorous, and easy maintenance;

4.2.4.2 (8) note that natural plantings are preferred, however, artificial turf may be used for small areas of roof-top play areas providing that sand (rather than rubber chips) is used as the medium to hold it in place and that the turf specified is to the satisfaction of CCFL. The Design-Builder will submit all safety information regarding the product to CCFL for review;

4.2.4.2 (9) ensure that all growing media are mushroom free;

4.2.4.2 (10) provide soil medium of appropriate depth to support vegetation and trees; and

4.2.4.2 (11) ensure the outdoor play area has pavers/decking and sandboxes.

4.2.4.3 Playground fall protection surfaces requirements

The Design-Builder will:

4.2.4.3 (1) design playground fall protection surfaces to cushion falls;

4.2.4.3 (2) ensure that the playground fall protection surfaces conform to the following requirements:

4.2.4.3 (2) (a) 1.8 metres clearance around equipment;

4.2.4.3 (2) (b) depth guidelines for loose fill materials;

.i minimum 0.15 metres for 1.5 metres high equipment; and

.ii minimum 0.30 metres for 2.3 metres high equipment;

4.2.4.3 (2) (c) for equipment that is over 0.45 metres but less than 1.5 metres, fall protection surfacing is required;

4.2.4.3 (2) (d) playground fall protection surfaces will be designed to accept wheelchairs / crutches;

4.2.4.3 (2) (e) playground fall protection surfaces will drain effectively;

4.2.4.3 (2) (f) engineered wood chip system complete with drainage, for example Fibar System 300; and

4.2.4.3 (2) (g) poured-in-place rubber system or a pre-approved alternative.

4.2.4.4 Playground equipment requirements

The Design-Builder:

4.2.4.4 (1) will design the playground equipment to meet the following safety requirements:

4.2.4.4 (1) (a) structures that incorporate stairs, landings, ladders, tunnels, or bridges must have safety barriers, guardrails, and railings;

4.2.4.4 (1) (b) equipment for Toddlers must be no more than 0.90 metres in height; and

4.2.4.4 (1) (c) equipment for Preschool children must be no more than 1.5 metres in height;

4.2.4.4 (2) may provide playground equipment that is custom-built, prefabricated or a combination of both;

4.2.4.4 (3) for prefabricated equipment, will provide a minimum two year guarantee on all plastic, metal and moving parts, and a minimum ten year guarantee on all wood parts;

4.2.4.4 (4) will not use pressure treated wood that contains arsenic;

4.2.4.4 (5) ensure that all wood in contact with soil or moisture is pressure treated; exposed wood that may be handled by children will not be pressure treated;

4.2.4.4 (6) provide sandboxes that conform to the following requirements:

4.2.4.4 (6) (a) sandboxes will have liners that are water-permeable and prevent sand leakage;

4.2.4.4 (6) (b) sandboxes will have protection board between the sand and the roof assembly;

4.2.4.4 (6) (c) sandboxes will be large enough for several children to play in at once;

4.2.4.4 (6) (d) sandboxes will be located away from entrance to minimize sand tracking inside the Childcare Centre;

4.2.4.4 (6) (e) sand depth will be:

.i minimum 305 millimetres for the Infant and Toddler playgrounds; and

.ii minimum 457 millimetres for the Preschool and Preschooler Group playgrounds; and

4.2.4.4 (6) (f) sand will meet that of play sand quality.

4.2.4.5 Drainage and grading requirements

The Design-Builder will:

4.2.4.5 (1) provide positive drainage of all areas including lawns and paved areas. Water ponding is not acceptable;

4.2.4.5 (2) provide drainage away from building entrances. Drainage of surface water towards buildings, across sidewalks or onto neighbouring properties is not acceptable;

4.2.4.5 (3) ensure all drains are lower than interior floors;

4.2.4.5 (4) ensure that all drains near engineered wood chip or sand play areas have the capability to trap sediment with an easily removable and cleanable sediment trap;

4.2.4.5 (5) ensure that drains are bi-level to drain both surface and roof waterproofing membrane;

4.2.4.5 (6) slope both surface and waterproofing membrane to drains;

4.2.4.5 (7) ensure all roofs have scuppers at a lower elevation than the interior floor elevation;

4.2.4.5 (8) design drainage such that, if any roof drain gets blocked, the ponded water will be able to flow to another exterior drain so that no water will enter the interior; and

4.2.4.5 (9) slope lawns from 1.5% to 6%.

4.2.4.6 Irrigation requirements

The Design-Builder will:

4.2.4.6 (1) ensure that all rooftop play areas are irrigated;

4.2.4.6 (2) ensure that irrigation uses high-efficiency irrigation technology;

4.2.4.6 (3) ensure that irrigation includes an irrigation controller as part of DDC system; stand-alone irrigation control systems are not acceptable; and

4.2.4.6 (4) provide hose bibs at minimum 15.25 metres apart.

4.2.5 Architectural Millwork

4.2.5.1 Construction / Quality

The Design-Builder will:

4.2.5.1 (1) refer to Section 6.5.1 of Statement of Requirements;

4.2.5.1 (2) provide a AWMAC guarantee as follows:

4.2.5.1 (2) (a) the Work will be subject to an inspection at the plant and/or site by an appointed AWMAC certified inspector. The Work will include all required inspections. Shop drawings will be submitted to the AWMAC Chapter office for review before the Work commences. Work that does not meet the AWMAC's standards as specified, will be replaced, reworked, and/or refinished by the architectural woodwork manufacturer, to the approval of AWMAC, at no additional cost to the Owner;

4.2.5.1 (2) (b) if the woodwork manufacturer is an AWMAC manufacturer member in good standing, a two year AWMAC guarantee certificate will be issued. The AWMAC guarantee will cover replacing, reworking and/or refinishing any deficient architectural woodwork due to faulty workmanship or defective materials supplied and/or installed by the woodwork manufacturer, which may appear during a two year period following the date of guarantee issuance; and

4.2.5.1 (2) (c) if the woodwork manufacturer is not an AWMAC manufacturer member they will provide the Owner with a two year maintenance bond, in lieu of the AWMAC guarantee certificate, to the full value of the architectural woodwork contract;

4.2.5.1 (3) use wood certified in accordance with the Forest Stewardship Council's Principles and Criteria if it is competitively priced with non-certified wood; and

4.2.5.1 (4) use adhesives and sealants that have low VOC levels per the LEED requirements listed under credit 4.1 "Low-Emitting Materials, Adhesives and Sealants."

4.2.5.2 Casework

4.2.5.2 (1) Refer to Section 6.5.1 of the Statement of Requirements for general requirements.

4.2.5.2 (2) The Design-Builder will provide the following:

4.2.5.2 (2) (a) Cabinets: 19 millimetre natural hardwood ply interiors with 12 millimetre natural hardwood ply backs. (Good quality melamine interiors have been used acceptably except under art sink, kitchen sink and around the dishwasher – these must be water resistant plywood core with plastic laminate to resist wet or stainless steel);

4.2.5.2 (2) (b) Drawers: 12 millimetre hardwood ply drawer sides, 6 millimetre hardwood ply bottoms, or pre-approved drawer systems;

4.2.5.2 (2) (c) Doors and drawer fronts, end panels, and all exposed edges and corners: 3 millimetres solid edges - all edges eased and corners rounded;

4.2.5.2 (2) (d) Finish (clear finish on wood): one coat of clear sealer, two coats of catalyzed clear lacquer finish - lacquer to be water and bleach (mild solution) resistant;

4.2.5.2 (2) (e) Base: toe kick height of all cabinets will be consistent with rubber base used in the Childcare Centre; rubber base over 19 millimetre plywood. Toe kick depth to be minimum 100 millimetres; and

4.2.5.2 (2) (f) Art drying rack: for perforated art shelves, use egg-crate light lenses in frames.

4.2.5.3 Countertops

The Design-Builder will provide countertops that comply with the following:

4.2.5.3 (1) refer to Section 6.5.1 of the Statement of Requirements for general requirements;

4.2.5.3 (2) 19 millimetre, high-density particle board post-formed with backer under unsupported spans over 914 millimetres, except, all counters with sinks will be water-resistant plywood core;

4.2.5.3 (3) exposed 90-degree corners in child areas to be rounded, all edges will be eased; and

4.2.5.3 (4) acceptable materials: plastic laminate (post-formed edges).

4.2.5.4 Backsplashes

The Design-Builder will provide backsplashes that comply with the following:

4.2.5.4 (1) refer to Section 6.5.1 of Statement of Requirements for general requirements;

4.2.5.4 (2) all counters with sinks will have minimum 100 millimetres backsplashes and sidesplashes, additionally provide water impervious surface on wall above art sinks and kitchen sinks min 600 millimetres high (or to underside of cabinets above);

4.2.5.4 (3) gypsum board with paint finish or vinyl wall covering not acceptable; and

4.2.5.4 (4) acceptable materials: plastic laminate (post-formed), ceramic tile, glass or other.

4.2.5.5 Hardware

The Design-Builder will provide hardware that complies with the following:

4.2.5.5 (1) refer to Section 6.5.1 of the Statement of Requirements for general requirements;

4.2.5.5 (2) all hardware to be commercial grade.

4.2.5.5 (3) Hinges:

- 4.2.5.5 (3) (a) 125° minimum, Blum or Mepla, or pre-approved equal; and
- 4.2.5.5 (3) (b) System screw mounting plates required at all hinges;

4.2.5.5 (4) Drawers:

- 4.2.5.5 (4) (a) Up to 150 millimetres deep - Blum or Mepla 3/4 extension slide or pre-approved equal; and
- 4.2.5.5 (4) (b) Over 150 millimetres - KV or Accuride full extension slides or pre-approved equal.

4.2.5.5 (5) Pulls: Richelieu 33205 Brushed D or similar easy to grab handle that is a pre-approved equal

4.2.5.5 (6) Standards: to be steel, adjustable on 12 millimetre centres, flush with cabinet side wall face.

4.2.5.5 (7) Shelf clips: to be compatible with the standards, and to allow for shelves to be mechanically fastened to support bracket.

4.2.5.5 (8) Locks: Corbin 0737 & 0738 with #75 Strike or pre-approved alternate and conforming with the following:

- 4.2.5.5 (8) (a) locks on all lockable millwork to have a common key;

4.2.5.5 (8) (b) different individual lock on staff cabinets/lockers with a master key; and

4.2.5.5 (8) (c) at a minimum, CCFL requires sharp items (for example, kitchen drawers containing knives) and any chemicals (for example, cabinets containing cleaning agents) to be locked. The Design-Builder will confirm these requirements with CCFL. Two drawers in each kitchen and all under-sink cabinets will have locks.

4.2.5.6 Seismic

The Design-Builder will:

4.2.5.6 (1) ensure that shelves, cupboards, and cabinets are made earthquake safe per CCFL's requirements; and

4.2.5.6 (2) ensure adjustable shelves are mechanically fastened to support bracket; and

4.2.5.6 (3) ensure all furnishings, millwork and storage units greater than 1.2 metres high are fixed to the wall.

4.2.6 Building Envelope and Roofing

4.2.6.1 Refer to envelope requirements in Schedule 1 – Statement of Requirements.

4.2.6.2 Roofs

4.2.6.2 (1) The Design-Builder will refer to Sections 6.6 Thermal Protection and 6.6.7 Roofing in the Statement of Requirements.

4.2.6.2 (2) Where an intensive green roof and planted areas are included in the Childcare Centre outdoor spaces, refer to Section 4.2.4 for requirements.

4.2.6.2 (3) The Design-Builder will provide a leak detection system at intensive green roof areas and rooftop playgrounds. This system must:

4.2.6.2 (3) (a) be reviewed with the Owner. All specifications and details of the proposed system are to be provided for review and approval prior to proceeding;

4.2.6.2 (3) (b) have a non-proprietor monitoring system; and

4.2.6.2 (3) (c) be compatible with, and actively connected to, the City's DDC systems to allow remote monitoring of any signals or alarms.

4.2.7 Glazing

4.2.7.1 Windows (general)

The Design-Builder will:

4.2.7.1 (1) refer to Sections 6.7.1.1.(4) and 6.7.14 of the Statement of Requirements for general glazing requirements, except for tempered

and laminated glazing which the Design-Builder will provide for the Childcare Centre in accordance with Section 4.2.7.1(3);

4.2.7.1 (2) provide in writing a warranty for windows against leakage, defects and malfunction under normal usage for minimum of two years;

4.2.7.1 (3) where a sill is 457 millimetres or less above the floor, or where impact with a window may occur, or a child will come in contact with glass (such as a mirror or window at a change table) use tempered glass or tempered and laminated glass (if CCFL guidelines are more stringent then they will supersede this section), in accordance with the following:

4.2.7.1 (3) (a) tempered only at interior single glazed windows;

4.2.7.1 (3) (b) tempered only at interior lite where exterior grade is within 610 millimetres of the interior floor level;

4.2.7.1 (3) (c) tempered at interior lite and laminated at exterior lite where the exterior grade is a significant drop below the interior floor level (i.e. a storey or more); and

4.2.7.1 (3) (d) the location of the Low-E coating application on the correct position on the window assembly will be studied and specified when used in conjunction with tempered and/or laminated glass.

4.2.7.2 Exterior openings

The Design-Builder will:

4.2.7.2 (1) refer to Section 6.7 Openings (Division 8) of the Statement of Requirements for general openings requirements, except for tempered and laminated glazing which the Design-Builder will provide for the Childcare Centre in accordance with Section 4.2.7.1(13);

4.2.7.2 (2) ensure all exterior windows, doors and other openings:

4.2.7.2 (2) (a) meet CAN/CSA-A440 standards per the Building Envelope Consultant's recommendations; and

4.2.7.2 (2) (b) are detailed, designed and installed as required by the Building Envelope Consultant for the project;

4.2.7.2 (3) ensure that exterior windows in children's areas are at a height that children can see out;

4.2.7.2 (4) ensure that all opening windows are:

4.2.7.2 (4) (a) limited to a maximum opening of 100 millimetres, where accessible by children; and

4.2.7.2 (4) (b) screened;

4.2.7.2 (5) where a window opens into a walkway or a play area, provide either a sliding window or restrict its swing so as not to create a safety hazard outside;

4.2.7.2 (6) use Low-E coatings on glass where solar heat gain may be significant. Mitigate unwanted solar gain with external shading; and

4.2.7.2 (7) use glass systems with good insulting values (low U-value) and thermal breaks.

4.2.7.3 Mirrors

4.2.7.3 (1) The Design-Builder will refer to the Childcare Centre Room Data Sheets to see the locations and specifications of mirrors.

4.2.7.4 Glazed canopies

4.2.7.4 (1) The Design-Builder will provide glazed canopies that are both tempered and laminated safety glass. They are to be designed such that if a pane breaks, it will be held in place and not fall onto the playground below.

4.2.8 Doors and Hardware

4.2.8.1 The Design-Builder will ensure that the main entry doors at ground level to the Childcare Centre are:

4.2.8.1 (1) equipped with a power-assisted door operator button for accessibility, and conform with the following:

4.2.8.1 (1) (a) coordinate accessible operator button function with security requirements (enterphone and Keyscan) for these doors; and

4.2.8.1 (1) (b) include power-assisted door operator buttons on the interior side of doors leading to unsecured exterior areas (e.g. street, parkade) to be activated by card reader.

4.2.8.1 (2) secured with an electric strike / card reader and simple one-step emergency exit hardware (e.g. paddle handle).

4.2.8.2 Doors (general)

4.2.8.2 (1) The Design-Builder will ensure that doors into any area occupied by children are fully glazed with tempered glass.

4.2.8.2 (2) The Design-Builder will provide 25 millimetres minimum clearance under door at half height doors.

4.2.8.3 Wood doors

The Design-Builder will:

4.2.8.3 (1) refer to Section 6.7.6 Wood Doors of the Statement of Requirements for general requirements;

4.2.8.3 (2) provide wood doors that meet AWMAC requirements for millwork; and

4.2.8.3 (3) provide wood doors that are solid wood core, except bi-fold and sliding doors to closets may be AWMAC hollow core doors.

4.2.8.4 Hardware

The Design-Builder will:

4.2.8.4 (1) provide only commercial grade hardware;

4.2.8.4 (2) provide hardware that meets accessibility requirements;

4.2.8.4 (3) provide additional support for half doors when not mounted in regular door frame;

4.2.8.4 (4) use heavy-duty piano hinge for full height of the half-height gates;

4.2.8.4 (5) ensure door stops are wall mounted where possible, complete with backing provided in the wall;

4.2.8.4 (6) ensure that sliding doors to play areas have the ability to pin in place at open position to avoid injury from unsupervised sliding;

4.2.8.4 (7) ensure that swing doors or gates within any child-occupied space or to outdoor play areas that are not forming part of a fire-rated separation have a hold-open device such as a hook-and-eye, an “elephant’s foot” stop, or similar;

4.2.8.4 (8) provide kick plates on the push side of all doors with closers and at all storage room doors;

4.2.8.4 (9) where an emergency exit occurs directly within the Childcare Centre (such as in an Activity room or any space occupied by children), ensure that the door will have a delay release and an alarm. Also:

4.2.8.4 (9) (a) if the emergency exit is also actively used as an entrance/exit to the Childcare Centre, then an alarm over-ride button (request to exit button) is to be provided at 1.5 metres above the finished floor for the use of staff and parents. This also includes doors on the exit stairs: Over-ride button required to over-ride 15 sec delay/alarm. Mount at 1.5m above the finished floor; and

4.2.8.4 (9) (b) if a local alarm is provided at a door with a power-assisted door operator button, the local alarm must ring when the power-assisted door operator button is pressed.

4.2.8.4 (10) install local alarm and request-to-exit over-ride buttons at all doors leading from main program room into lobbies, or other unsupervised spaces. Refer also to Security section.

4.2.8.5 Locks

The Design-Builder will:

4.2.8.5 (1) ensure all locks are commercial grade;

4.2.8.5 (2) provide final keys prior to the Owner’s occupancy of the Childcare Centre;

4.2.8.5 (3) use an interior locking strategy as follows:

4.2.8.5 (3) (a) all doors will have the same master key;

4.2.8.5 (3) (b) all exterior entry doors will be on same key (see also Security);

4.2.8.5 (3) (c) internal doors and exterior storage will be on the same key, zoned where individual programs can be isolated; and

4.2.8.5 (3) (d) service rooms will be on the same key;

4.2.8.5 (4) refer to the Childcare Centre Room Data Sheets to see lock function of each area door;

4.2.8.5 (5) provide deadbolt locks on both sides of low gates to exterior. Low gates between play areas, provide ball handsets only. VBBL may require other approaches to security; and

4.2.8.5 (6) provide a system where doors default to locked from the exterior but permit free passage for exiting from the interior during a fire alarm or power failure.

4.2.9 Finishes

4.2.9.1 Partitions

4.2.9.1 (1) The Design-Builder will refer to Appendix 1C – Acoustic and Noise Control Ratings for acoustical requirements.

4.2.9.1 (2) The Design-Builder will provide blocking inside walls at all millwork locations and furniture locations where furniture will be fixed to walls and at wall-mounted doorstops.

4.2.9.2 Wall finishes

The Design-Builder will:

4.2.9.2 (1) refer to Section 6.8 of the Statement of Requirements for general requirements.

4.2.9.2 (2) provide wall finishes that comply with the following requirements:

4.2.9.2 (2) (a) Paint: painting and finishing to be “Premium Grade” Master Painter and Decoration Association Recommendations and Standards; products to be MPI approved Institutional Low Odour VOC quality paint.

.i provide a two year MPI guarantee or 100% two year Maintenance bond both in accordance with MPI Painting Specification Manual requirements;

.ii all painting work to be inspected by a paint agency inspector acceptable to the Owner;

.iii provide documentation that the MPI approved Institutional Low Odour VOC quality paint is being used;

.iv all surfaces, including those to be covered with wall vinyl, to have one coat of Hi- hide sealer primer to suit surface;

.v apply three finish coats and additional coats to cover as required; and

.vi paint to be brush and roller applied, completely dried, and sanded between coats and finished to a smooth surface without streaks or marks;

4.2.9.2 (2) (b) Gloss levels:

.i kitchens, washrooms, laundry and janitor's room walls and ceilings to be G5 (semi-gloss);

.ii painted doors and door frames to be G5 (semi-gloss);

.iii all other surfaces to be either G5 (semi-gloss), G4 (satin), or G3 (eggshell); and

.iv G1 and G2 (matte) finishes are not acceptable;

4.2.9.2 (2) (c) Wall protection to be applied in all rooms except staff offices to minimum 0.8 metres above the finished floor. Top edges and corners of wall protection material to be in turn protected . Acceptable wall protection materials:

.i Plastic laminate;

.ii Vinyl-acrylic sheet material (PVC-free) such as Acrovyn® or pre-approved alternate;

.iii Sheet flooring or pre-approved alternate;

.iv Note that due to re-finishing costs, wood is not preferred;

4.2.9.2 (2) (d) Tile: quarry and ceramic tile installation is to be in accordance with the recommendations of the Terrazzo Tile and Marble Association of Canada;

4.2.9.3 Ceiling finishes (coordinate with acoustic requirements)
The Design-Builder will:

4.2.9.3 (1) refer to Sections 4.9.13 Ceilings and 6.8 Finishes (Division 9) of the Statement of Requirements for general requirements

4.2.9.3 (2) refer to Appendix 1C – Acoustics and Noise Control Ratings for acoustics requirements.

4.2.9.3 (3) paint all exposed structure and services in spaces where there is no ceiling (typically storage and utility rooms).

4.2.9.3 (4) ensure gypsum board ceilings are painted;

4.2.9.3 (5) ensure acoustic tile ceilings are commercial quality with T-bar system. Acoustic ceiling tiles to be minimum 16 millimetres thick;

4.2.9.3 (6) ensure access is provided to all above-ceiling services. Above-ceiling access will not be located in nap rooms; and

4.2.9.3 (7) ensure all kitchens have ceiling finishes that are washable.

4.2.9.4 Floor finishes

The Design-Builder will:

4.2.9.4 (1) refer to Sections 4.9.14 Floor Finishes and 6.8 Finishes (Division 9) of the Statement of Requirements for general requirements on floor finishes;

4.2.9.4 (2) install carpet and resilient flooring in accordance with the recommendations of the National Floor Covering Association as detailed in their "Floor Covering Specification Manual" as issued by the BC Floor covering Association;

4.2.9.4 (3) use adhesives and sealants that have low VOC levels per LEED® requirements listed under credit 4.1 "Low-Emitting Materials, Adhesives and Sealants."

4.2.9.4 (4) provide carpets in accordance with the following requirements:

- 4.2.9.4 (4) (a) carpet systems will meet or exceed the Carpet and Rug Institute's Green Label Plus testing and product requirements per LEED® requirements listed under credit 4.3 "Low-Emitting Materials, Carpet Systems";
- 4.2.9.4 (4) (b) provide underpad in nap areas and quiet rooms (confirm with CCFL). Acceptable product: 6 millimetre Duracushion, or pre-approved alternate;
- 4.2.9.4 (4) (c) the carpet pattern must be integrated; applied patterns are not acceptable;
- 4.2.9.4 (4) (d) carpet may be broadloom or carpet tile;
- 4.2.9.4 (4) (e) carpet will be solution dyed nylon, level loop construction, pile weight 950 grams/SM (28 oz/yd2) minimum if broadloom, or 610 grams/SM (18 oz/yd2) minimum if carpet tile;
- 4.2.9.4 (4) (f) all edges will be sealed;
- 4.2.9.4 (4) (g) provide 5% extra of carpet of the same dye lot as installed for future maintenance requirements;
- 4.2.9.4 (4) (h) loose fitting, breaking of seams, breaking away from the sub-base or any other installation defect is not acceptable and will be noted as deficiencies to be corrected by the Design-Builder; and
- 4.2.9.4 (4) (i) carpet manufacturer will provide a ten year guarantee that the carpet will retain 90% or more of its pile fibre. The guarantee will also cover against defects of zippering, unravelling, colour fading, deterioration and delamination of backing materials, pulls, piling, matting, shedding or any other manufacturing defect.

4.2.9.4 (5) provide resilient flooring that conforms with the following requirements:

- 4.2.9.4 (5) (a) homogeneous sheet vinyl with heat welded seams, for example Tarkett or other pre-approved alternate (minimize VOC off-gassing);

4.2.9.4 (5) (b) homogeneous sheet rubber with welded seams or pre-approved alternate;

4.2.9.4 (5) (c) linoleum is not acceptable;

4.2.9.4 (5) (d) all edges will be sealed;

4.2.9.4 (5) (e) all resilient flooring will be sheet material (tiles not acceptable);

4.2.9.4 (5) (f) provide 5% extra of resilient flooring material of the same production run as installed for future maintenance requirements. Provide sheet materials in full roll width by the length require;

4.2.9.4 (5) (g) loose fitting, breaking of seams, breaking away from the sub-base or any other installation defect is not acceptable and will be noted as deficiencies to be corrected by the Design-Builder; and

4.2.9.4 (5) (h) Provide a minimum five (5) year manufacturers' guarantee that the resilient flooring will provide the specified level of appearance and wear, subject to proper care and maintenance.

4.2.9.5 At high wear and tear locations in the Childcare Centre, such as the main entrance and the entrances from the playground, the Design-Builder will use durable flooring material such as ceramic tile. All surfaces will be non-abrasive, washable, and cleanable.

4.2.9.6 The Design-Builder will ensure that the base is rubber, continuous throughout, and minimum 100 millimetres high.

4.2.9.7 Where demountable partitions and other items are indicated for installation on top of flooring material, the Design-Builder will install flooring material before these items are installed.

4.2.10 Specialties

4.2.10.1 Toilet partitions

4.2.10.1 (1) The Design-Builder will provide toilet partitions that comply with the following requirements:

4.2.10.1 (1) (a) plastic laminate covered, high-density particleboard. Acceptable product: Bobrick 1040 series or pre-approved alternative;

4.2.10.1 (1) (b) metal with baked enamel finish. Acceptable product: Shanahan's baked enamel metal toilet partitions or pre-approved alternative;

4.2.10.1 (1) (c) phenolic if budget allows. Acceptable product: Bobrick 1080/1180 series FRP faced phenolic core partitions or pre-approved alternative; and

4.2.10.1 (1) (d) hardware: heavy duty stainless steel with tamper-proof screws, concealed where possible.

4.2.10.1 (2) The Design-Builder will refer to the Childcare Centre Room Data Sheets for locations and requirements relating to toilet partitions.

4.2.10.2 Washroom accessories

4.2.10.2 (1) The Design-Builder will refer to the Childcare Centre Room Data Sheets for locations and requirements relating to washroom accessories.

4.2.10.3 Blinds

4.2.10.3 (1) The Design-Builder will refer to the Childcare Centre Room Data Sheets for locations and requirements, and provide blinds that comply with the following requirements:

4.2.10.3 (1) (a) all blinds will be commercial grade; chain operated roller style;

4.2.10.3 (1) (b) blinds will be installed on all exterior windows;

4.2.10.3 (1) (c) all cords or chains will terminate 1.5 metres above the finished floor or will be supported on a hook at that height; and

4.2.10.3 (1) (d) provide blinds on doors. Blinds on doors will be secured to bottom of door with a child-safe device.

4.2.10.4 Mailboxes

4.2.10.4 (1) The Childcare Centre will have its own civic address for Canada Post mail service and deliveries.

4.2.10.4 (2) The Design-Builder will provide a dedicated large mailbox for the Childcare Centre.

4.2.10.4 (3) The Design-Builder will ensure that the mailbox will be safe, weather-protected, lockable, and accessible from the interior of the Childcare Centre.

4.2.10.5 Entrance mats

4.2.10.5 (1) The Design-Builder will provide walk-off mats at all entrances from the outdoors. The minimum size will allow for an adult to take two steps before stepping onto another flooring surface.

4.2.10.5 (2) The Design-Builder may provide either a child- safe recessed grille or surface walk-off mats.

4.2.10.6 Notice boards

4.2.10.6 (1) The Design-Builder will refer to the Childcare Centre Room Data Sheets for locations and requirements relating to notice boards.

4.2.10.7 Signage

The Design-Builder will:

4.2.10.7 (1) refer to Section 4.14 Wayfinding and Signage of the Statement of Requirements;

4.2.10.7 (2) ensure signage conforms to the City of Vancouver Sign By-Law;

4.2.10.7 (3) ensure signage conforms to accessibility requirements for disabled persons;

4.2.10.7 (4) provide signage:

4.2.10.7 (4) (a) to identify the Childcare Centre;

4.2.10.7 (4) (b) to indicate the entrance to the Childcare Centre;

4.2.10.7 (4) (c) at dedicated parking stalls;

4.2.10.7 (4) (d) for all necessary wayfinding;

4.2.10.7 (4) (e) at entries to each Group;

4.2.10.7 (4) (f) at service rooms; and

4.2.10.7 (4) (g) on interior doors and the intercom panel; and

4.2.10.7 (5) provide all signage required by VBBL, including fire and life safety evacuation plans.

4.2.10.8 Fire and Life Safety Plans

4.2.10.8 (1) The Design-Builder will review the fire safety plans with the Owner and CCFL prior to submission to the applicable fire department at Substantial Completion.

4.2.10.8 (2) The Design-Builder will include a copy of the fire and life safety plans in the operations and maintenance manuals for the Owner.

4.2.10.9 Fire Extinguishers

The Design-Builder will ensure that:

4.2.10.9 (1) fire extinguishers are recessed unless surface mounted extinguisher has been approved by the Owner;

4.2.10.9 (2) surface-mounted fire extinguishers have rounded corners and edges;

4.2.10.9 (3) surface-mounted fire extinguishers are not located in high traffic areas for children's activities where they may create a hazard; and

4.2.10.9 (4) covers and access doors on fire extinguisher cabinets are child-safe.

4.2.10.10 Elevator

4.2.10.10 (1) The Design-Builder will refer to Section 6.12 Conveying Equipment of the Statement of Requirements for elevator requirements.

4.2.11 Equipment

4.2.11.1 The Design-Builder will:

4.2.11.1 (1) ensure that all appliances will be "Energy Star" where "Energy Star" has that appliance category;

4.2.11.1 (2) provide minimum five year warranty commercial washers, dryers, and dishwashers, minimum two year warranty on microwave ovens, and minimum one year warranty on all other appliances;

4.2.11.1 (3) ensure all appliances have white finish;

4.2.11.1 (4) provide the following equipment in all kitchens in the Childcare Centre:

4.2.11.1 (4) (a) commercial style dishwasher with a sani-cycle, 70 degrees Fahrenheit heat booster, and back-flow preventer valve. Note that these dishwashers require deeper than standard millwork: millwork will be designed to suit. Moyer Diebel model #501HT with 70 degrees Fahrenheit rise booster or approved equivalent;

4.2.11.1 (4) (b) refrigerator: 21.5 cubic feet, frost free, with freezer compartment. Whirlpool model #EB9FVHXWQ or approved equivalent;

4.2.11.1 (4) (c) stove with oven: 0.76 metres wide, with four (4) burners; placement of controls will be suitable for child safety, for example at back; self-cleaning convection oven. (Separate wall oven and range top are also acceptable.) Whirlpool model #YWFE710HOBW or approved equivalent;

4.2.11.1 (4) (d) range hood to mechanically exhaust stove to the outside; exhaust rate (CFM) will be determined by HVAC engineer. GE model #JV635NWWC or approved equivalent; and

4.2.11.1 (4) (e) microwave oven: 2.0 cubic feet, 1100 watt, minimum. Panasonic model #NNSN968W or approved equivalent.

4.2.11.2 If the kitchen is shared, the Design-Builder will provide for each Program its own full-sized fridge (with freezer), frost free - 18.5 cubic feet, 0.8 metres wide, and one upright freezer for each kitchen (20.1 cubic ft) - this is to be shared between two Programs, and can be located in a storage room. Upright freezer will be Whirlpool model #EV200NZTQ or approved equivalent;

4.2.11.3 Infant Program – dedicated kitchen:

4.2.11.3 (1) The Design-Builder will provide the same as for kitchen requirements in 4.2.11.4 except no stove is required if there is a full kitchen serving other programs nearby in the Childcare Centre;

4.2.11.4 Laundry Room serving two or more program Groups:

4.2.11.4 (1) The Design-Builder will provide:

4.2.11.4 (1) (a) two commercial washing machines. Specify a front-loading machine for water conservation. Maytag model #MHN30PR Commercial High-efficiency Front-load washer or approved equivalent; and

4.2.11.4 (1) (b) The Design-Builder will provide two commercial dryers are required. Maytag model

#MDE/MDG25PR Commercial Super Capacity Dryer;

4.2.11.5 Laundry room serving one program Group:

4.2.11.5 (1) The Design-Builder will provide:

4.2.11.5 (1) (a) one commercial washing machine is required. Specify a front-loading machine for water conservation. Maytag model #MHN30PR Commercial High-efficiency Front-load washer or approved equivalent;

4.2.11.5 (1) (b) one commercial dryer is required. Maytag model #MDE/MDG25PR Commercial Super Capacity Dryer; and

4.2.11.5 (1) (c) side-by-side machines are required.

4.2.11.6 Garbage and Recycling:

The Design-Builder will refer to Section 4.12.2.1(24) of the Statement of Requirements for Childcare Centre garbage room requirements.

4.2.12 Furnishings

4.2.12.1 Seismic

4.2.12.1 (1) The Design-Builder will secure all furnishings greater than 1.22 metres high to prevent tipping.

4.2.13 Mechanical

4.2.13.1 HVAC

The Design-Builder will:

4.2.13.1 (1) design the Childcare Centre with its own heating, ventilation and mechanical cooling systems which are separate from the rest of the Facility. Mechanical cooling of occupied childcare spaces is required;

4.2.13.1 (2) design the HVAC system to suit spaces with operable windows. Note that the doors from activity rooms to outdoor playgrounds may be held open for extended periods;

4.2.13.1 (3) ensure all rooms are ventilated to remove odours, particularly from diapering, laundry and washroom areas (to meet ASHRAE Standard 62);

4.2.13.1 (4) ensure exhaust fans are 1.5 sone or less;

4.2.13.1 (5) locate all air intakes away from sources of fumes or dust;

4.2.13.1 (6) not use baseboard heaters or radiators;

4.2.13.1 (7) use electricity as the fuel source for space and domestic hot water heating. Natural gas will not be used;

4.2.13.1 (8) ensure equipment is easily accessible for maintenance. For example, filters and remote condensing units will be accessible without the use of temporary scaffolding or Genie Lift type equipment. Equipment will be installed so that fall arrest systems are not required for access. Units will not be installed in nap room ceiling spaces;

4.2.13.1 (9) ensure heating and cooling to the Childcare Centre is provided by a 2-pipe air source heat pump;

4.2.13.1 (10) provide heating and cooling for all areas by unit ventilators. Unit ventilators will be capable of providing a minimum of eight (8) air changes per hour of ventilation for free cooling. Electric heating will be provided in the unit ventilator or in the supply duct to provide back-up heating to meet full design heating capacity when the air source heat pump is off, and to provide heating when required during shoulder seasons when the ASHP is in cooling mode. Electric heating will be controlled by modulating controllers (SCR type) to provide accurate temperature control;

4.2.13.1 (11) ensure the unit ventilator is capable of providing a minimum of 125% of the ASHRAE 62.1 outdoor air ventilation rates at design winter conditions;

4.2.13.1 (12) ensure all electrical power for the HVAC system is supplied from the separately metered electrical service to the Childcare Centre;

4.2.13.1 (13) ensure that each Group room within the Childcare Centre has its own dedicated ventilation system. This can be achieved with one or more dedicated unit ventilator(s);

4.2.13.1 (14) design the HVAC system to achieve a maximum room noise level of 35dBA for all areas; and

4.2.13.1 (15) AERMEC is an acceptable ASHP supplier.

4.2.13.2 Controls

The Design-Builder will:

4.2.13.2 (1) integrate the controls system for the Childcare Centre with the DDC control system for the School, and ensure the systems are supplied and installed by the same contractor. Separate graphics pages will be provided for the Childcare Centre within the DDC system and password access will be provided so that staff can access them for monitoring and adjustment purposes;

4.2.13.2 (2) ensure that each activity room, nap room, and gross motor room temperature may be controlled individually;

4.2.13.2 (3) ensure that perimeter is on separate zones if the layout of spaces / windows creates problem areas;

4.2.13.2 (4) install a permanent carbon dioxide monitoring system. Install monitoring devices at areas with the highest occupancy per the Design-Builder's controls engineer's direction. At minimum, the nap / gross motor room and the activity room will be monitored;

4.2.13.2 (5) carefully consider the control strategies for the 2-pipe heat pump, considering switchover set points between cooling mode, free cooling mode, and heating modes with supplementary electric heating. There will be no simultaneous cooling by heat pump and heating to temperature set point by electric heating coil in the same zone;

4.2.13.2 (6) refer also to Landscape (irrigation controls), Roofing (leak detections system monitoring), Metering and Lighting Controls sections for other items will be on DDC system; and

4.2.13.2 (7) refer to the City of Vancouver's publicly available "DDC Technical Guidelines Version 1.1" for more details.

4.2.13.3 Plumbing

The Design-Builder will:

4.2.13.3 (1) ensure that all drains in outdoor play areas, particularly if they are also roof drains, have sediment traps, and conform to the following requirements:

4.2.13.3 (1) (a) traps will be accessible for clean-out; and

4.2.13.3 (1) (b) if there is not sufficient head room in the space below for a sediment trap, then at minimum provide a wye 45-degree elbow complete with clean-out access;

4.2.13.3 (2) at roof drains in play areas, use two level drains (at play surface and at roof membrane) and provide sediment traps in hard surfaces near loose fill and entrances - refer also to Section 4.2.4.5 – Drainage and Grading;

4.2.13.3 (3) provide interior floor drains in each washroom, kitchen, and janitor room, and ensure floor drains conform with the following requirements:

4.2.13.3 (3) (a) all floor drains to have pre-approved trap primers; and

4.2.13.3 (3) (b) trap primers will be accessible within the same room as the floor drain behind access panels;

4.2.13.3 (4) provide non-freeze hose bibs as specified in the VSB Mechanical Standards as listed:

4.2.13.3 (4) (a) two in each outdoor play area, one at the building, one near the sandbox or children's urban agriculture plots;

4.2.13.3 (4) (b) at condensing units;

4.2.13.3 (4) (c) at any green roof; and

4.2.13.3 (4) (d) in the garbage room shared with the School, a floor drain;

4.2.13.3 (5) provide hose ribs that are:

4.2.13.3 (5) (a) frost-free with a vacuum breaker;

4.2.13.3 (5) (b) vandal-proof when they occur at grade or at any location that is accessible to the public;

4.2.13.3 (5) (c) recessed if wall-mounted in outdoor play areas; and

4.2.13.3 (5) (d) keyed and tamper-proof in outdoor play areas;

4.2.13.3 (6) ensure that hot water is temperature adjustable as follows:

4.2.13.3 (6) (a) provide temperature controlled water (max. 49 degrees C or 120 degrees F) to all children's hand basins, art sinks, diapering sinks, and any other sinks children will be using. CSA approved mixing valves will be provided locally as required at these locations;

4.2.13.3 (6) (b) set the temperature at children's sinks to between 38 – 40 degrees C (100 – 104 degrees F) prior to occupancy; and

4.2.13.3 (6) (c) provide high temperature water to kitchen, dishwasher, laundry, and janitor's sink;

4.2.13.3 (7) ensure all hot water tanks:

4.2.13.3 (7) (a) are seismically secured;

4.2.13.3 (7) (b) have drain/leak pans installed and piped to drain; and

4.2.13.3 (7) (c) is set at 60 degrees C (140 degrees F) minimum;

4.2.13.3 (8) ensure that each plumbing fixture has its own shut-off valve;

4.2.13.3 (9) ensure all faucets have aerators for water conservation;

4.2.13.3 (10) ensure all art sinks are stainless steel complete with a faucet ledge and conform with the following:

4.2.13.3 (10) (a) 395-millimetres deep sinks are preferred; and

4.2.13.3 (10) (b) provide a floor mounted sediment trap at all art sinks;

4.2.13.3 (11) at diaper change table, provide a single compartment stainless steel sink complete with a faucet ledge, minimum 300 millimetres deep, with swing tap (gooseneck preferred) and hand spray attachment;

4.2.13.3 (12) in each kitchen:

4.2.13.3 (12) (a) provide a 2-compartment stainless steel sink complete with faucet ledge; and

4.2.13.3 (12) (b) provide a separate single compartment stainless steel hand washing sink, complete with faucet ledge, in the largest kitchen to support a catered lunch program. If space allows, also provide this sink in other kitchens;

4.2.13.3 (13) provide a floor-mounted mop sink in each janitor room, complete with approved backflow preventer valve;

4.2.13.3 (14) ensure all children's toilets are tank style with round bowls and closed front toilet seats;

4.2.13.3 (15) at full-size toilets, provide low-flow, gravity standard, and dual flush. Toilets to meet a Maximum Performance (MaP) Test of 500g or better;

4.2.13.3 (16) ensure that numbers of fixtures at children's washrooms to meet the CCFL regulation of one toilet and one hand basin for every ten children;

4.2.13.3 (17) for the Infant washroom, provide per Group minimum:

4.2.13.3 (17) (a) one 250 millimetre high toilet, sealed to the floor, complete with closed front toilet seat; and

4.2.13.3 (17) (b) one child-accessible hand basin with lever faucets (refer to Section 4.3 – Millwork Reference); and

4.2.13.3 (18) for the Toddler washroom, provide per Group minimum:

4.2.13.3 (18) (a) two toilets, sealed to the floor, complete with closed front toilet seat (may be 250 millimetres or full size); and

4.2.13.3 (18) (b) two child-accessible hand basins with lever faucets (refer to Section 4.3 – Millwork Reference);

4.2.13.3 (19) for Preschooler and Preschool washrooms, provide per Group minimum:

4.2.13.3 (19) (a) three toilets, full size, sealed to the floor, complete with closed front toilet seat. Provide privacy for one toilet; and

4.2.13.3 (19) (b) three child-accessible hand basins with lever faucets. Refer to Section 4.3–Millwork Reference.

4.2.13.4 Access panels

4.2.13.4 (1) Where access panel are required, the Design-Builder will locate in areas inaccessible to children.

4.2.13.4 (2) If an access panel is located in a child-accessible area, the Design-Builder will ensure that the panel has smooth, rounded, and eased edges and is tamper-proof.

4.2.13.5 Metering

4.2.13.5 (1) The Design-Builder will ensure that the Childcare Centre has dedicated electricity and water sub-meters located in service rooms that are easily accessible to the staff of the Childcare Centre.

4.2.13.5 (2) The Design-Builder will ensure that all sub-meters are connected to DDC and trended for monitoring.

4.2.14 Electrical

4.2.14.1 Power

The Design-Builder will:

4.2.14.1 (1) ensure all outlets are childproof; to have childproof and shatterproof faceplates;

4.2.14.1 (2) ensure GFCI receptacles are tamper resistant;

4.2.14.1 (3) provide high outlets at music shelf locations tamper-resistant CSA 5-15R with 5.1A USB Type A/Type-C;

4.2.14.1 (4) provide power in exterior play areas. It will be Class A GFCI protected with extra-duty in-use covers;

4.2.14.1 (5) not install in-floor outlets;

4.2.14.1 (6) ensure installation of systems in existing building requiring core drilling is evaluated by a registered structural engineer;

4.2.14.1 (7) ensure all penetrations (walls, floors, and roof) have firestop and appropriate sealing;

4.2.14.1 (8) provide a weather-proof outlet at any roof-top or exterior-located mechanical equipment;

4.2.14.1 (9) ensure sufficient power for:

- 4.2.14.1 (9) (a) photocopier(s);
- 4.2.14.1 (9) (b) stove(s)/oven(s);
- 4.2.14.1 (9) (c) washer(s)/dryer(s);
- 4.2.14.1 (9) (d) freezer(s);
- 4.2.14.1 (9) (e) refrigerator(s);
- 4.2.14.1 (9) (f) microwave(s);
- 4.2.14.1 (9) (g) dishwasher (note: commercial type complete with hot water booster);
- 4.2.14.1 (9) (h) portable phones and answering machine;

4.2.14.1 (10) ensure power in kitchens are to residential standards plus provide an additional four split outlets on dedicated circuit breakers (i.e. kettle and microwave will not share a single circuit breaker; and

4.2.14.1 (11) ensure that electrical panels are bolt-on Schneider or Eaton and fully rated for the available fault current. No series rated combinations.

4.2.14.2 Wiring

4.2.14.2 (1) The Design-Builder will ensure wiring is #12 AWG copper with a maximum of five (5) general use receptacles on one circuit.

4.2.14.3 Lighting

The Design-Builder will:

4.2.14.3 (1) provide LED lighting;

4.2.14.3 (2) provide minimum lighting levels per CCFL Guidelines (Note this is not an exemption from the energy requirements prescribed per the VBBL - lighting levels must be carefully designed to meet both):

4.2.14.3 (2) (a) 30 ft. candles (320 lux) in nap rooms, quiet rooms, and infant activity room (if applicable);

4.2.14.3 (2) (b) 40 ft. candles (420 lux) in the Preschool, Preschooler, and Toddler activity rooms; and

4.2.14.3 (2) (c) 50 ft. candles (540 lux) in the kitchen, offices, and washrooms;

4.2.14.3 (3) ensure that diaper changing areas have glare shielding for overhead fixtures. Use fixtures that are not high heat producers;

4.2.14.3 (4) ensure all fixtures will be properly shielded or use shatterproof bulbs;

4.2.14.3 (5) minimize the number of fixture types and lamp types; no more than four fixture types for indoor use. No more than three fixture types for exterior uses;

4.2.14.3 (6) provide lighting power density calculations for review by the Owner. Calculations to be provided in W/ft^2.

4.2.14.3 (7) not use halogen lamps;

4.2.14.3 (8) provide exterior lighting in play areas, to illuminate entries, exits, high activity areas such as play structures and sandboxes, and as required for security;

4.2.14.3 (9) ensure outside lighting has HOA (Hand/Off/Auto switch) controls for servicing; and

4.2.14.3 (10) where the Facility has an emergency generator, ensure the emergency lighting system is powered by the generator and not be powered by separate battery packs.

4.2.14.4 Lighting Controls

The Design-Builder will:

4.2.14.4 (1) ensure that each room or area has its own light switch/controls – to be designed to be simple and intuitive;

4.2.14.4 (2) provide multi-level switching for each area of activity room, gross motor/nap room and quiet room;

4.2.14.4 (3) provide dimmers in quiet rooms, parent rooms, and gross motor/nap rooms for one or two light fixtures;

4.2.14.4 (4) ensure quiet rooms and gross motor/nap rooms will not have any un-switched lights (for example, security lighting);

4.2.14.4 (5) ensure that quiet rooms and gross motor/nap rooms have their switches located outside the rooms;

4.2.14.4 (6) provide occupancy sensors in storage rooms;

4.2.14.4 (7) provide occupancy sensors throughout to turn off lighting, in which case the wall switches function only to turn lighting on.

4.2.14.4 (8) provide DDC controls for lighting such that:

4.2.14.4 (8) (a) lighting is turned off 30 minutes after scheduled end of day;

4.2.14.4 (8) (b) sweeps are to be programmed to turn lights off every hour until 30 minutes before opening. Provide 2-minute flicker warning;

4.2.14.4 (8) (c) outdoor lighting to be separately programmable from indoor lighting such that they can be controlled for ambient light levels and schedule;

4.2.14.4 (8) (d) wall switches to over-ride DDC controls at all times; and

4.2.14.4 (8) (e) entrance, vestibule, and main hall will maintain a minimum light level during all hours for safety and security.

4.2.14.5 Metering

4.2.14.5 (1) The Design-Builder will ensure that the Childcare Centre has a separate BC Hydro meter.

4.2.14.6 Fire Alarm

4.2.14.6 (1) The Design-Builder will install sounding devices at all outdoor play areas. This is of particular concern at roof top outdoor play areas.

4.2.14.6 (2) The Design-Builder will coordinate set-up of fire alarm monitoring with the monitoring company of the School.

4.2.15 IMIT

4.2.15.1 General

The Design-Builder will:

4.2.15.1 (1) ensure all installations in Section 4.2.15 adhere to the following codes and standards:

4.2.15.1 (1) (a) ANSI/TIA-568.1-D, Commercial Building Telecommunications Cabling Standard, Ed. D, 09-2015;

4.2.15.1 (1) (b) ANSI/TIA-568-C.2, Balanced Twisted-Pair Telecommunication Cabling and Components Standard, Ed. C, Err. 04-2014;

4.2.15.1 (1) (c) ANSI/TIA-568.3-D, Optical Fibre Cabling and Components Standard, Ed. D, 10-2016;

4.2.15.1 (1) (d) ANSI/TIA-607-C Generic “Telecommunications Bonding and Grounding (Earthing) for Customer Premise;

4.2.15.1 (1) (e) CSA 22.1: Canadian Electrical Code (2018);

4.2.15.1 (2) ensure all installation comply with standards, practices, methods, and procedures conforming to the law and degree of skill and care, diligence, prudence, and foresight which would be reasonably and ordinarily expected from a skilled and experienced person or body engaged in a similar type of undertaking under the same or similar circumstances.

4.2.15.2 Telecommunications Closet

The Design-Builder will:

4.2.15.2 (1) provide one telecommunication closet sized 3.5 metres by 4 metres.

4.2.15.2 (2) ensure the telecommunications closet contains the following;

4.2.15.2 (2) (a) one 19”, 24RU, lockable data cabinet;

4.2.15.2 (2) (b) access control panels;

4.2.15.2 (2) (c) intrusion alarm panels;

4.2.15.2 (2) (d) telecommunications grounding bus bar;

4.2.15.2 (2) (e) enterphone equipment;

4.2.15.2 (2) (f) Owner-supplied IP/PBX;

4.2.15.2 (2) (g) wall-mounted BIX (for analog phone lines); and

4.2.15.2 (2) (h) 2-hour fire-rated plywood around the perimeter of the room;

4.2.15.2 (3) provide grounding bus in the telecommunications closet and provide bonding from the main telecommunications room located in the School and where required as per ANSI/TIA-607-C;

4.2.15.2 (4) ensure cooling capacity for the telecommunications closet is 3kW.

4.2.15.3 Horizontal and Backbone Cabling

The Design-Builder will:

4.2.15.3 (1) ensure a seamless integration to the service providers (SP) incoming fibre, cable (COAX) and telephony systems via the School main telecommunication room or entrance facility where the demarcation point is located. A separate physical connection will be made to the Childcare Centre for billing purposes for all systems at each SP demarcation point. Provide all coordination work and equipment needed for a fully functional and complete connection to each SP for each system;

4.2.15.3 (2) use approved manufacturer: CommScope or approved equal;

4.2.15.3 (3) ensure horizontal cabling is CAT6 UTP;

4.2.15.3 (4) ensure all cabling is rated for the space it is installed. Spaces include, but are not limited to:

4.2.15.3 (4) (a)	FT6 in plenum spaces;
4.2.15.3 (4) (b)	armored cable in exposed areas; and
4.2.15.3 (4) (c)	weatherproof in wet locations (including conduits in slab on grade);

4.2.15.3 (5) provide a 6-strand, tight buffered, 50/125 micron, OM3 multimode fibre cable from the Childcare Centre data rack fibre enclosure to the School main telecommunications room or entrance facility (demarcation point) for connection to the SP. Terminate (Type LC connectors), splice, label all fibres on each end and provide all necessary patch panels, racks, enclosures, and connections as required for a fully functional system. The fibre will be run in 53 millimetre EMT conduit;

4.2.15.3 (6) provide a 25-pair, Category 3, copper backbone from the telecommunications room located in the Childcare Centre to the main telecommunications room located in the School. Each end of the copper backbone cable will terminate on a Belden BIX connector. Each Bix will be installed in a BIX mount. All copper backbone cabling will be run in 53 millimetre EMT conduit. Provide all necessary cross-connections to SP;

4.2.15.3 (7) provide an RG6, coaxial cable from the telecommunications room located in the Childcare Centre to the main telecommunications room located in the School. One end will terminate at the SP demarcation point and the other at a splitter sized to accommodate all coaxial outlets in the Childcare Centre. All copper backbone cabling will be run in 53 millimetre EMT conduit. Provide signal amplifiers as required;

4.2.15.3 (8) ensure a seamless fully functioning connection from the public switched telephone network (PSTN) to the Childcare Centre;

4.2.15.3 (9) ensure all horizontal cabling is run in basket type cable tray with a maximum fill ratio of 25% or enclosed in EMT conduit minimum 27 millimetres except in short sections from cable tray to EMT for wall drops where J-hooks can be utilized;

4.2.15.3 (10) ensure data drop outlets are provided with a recessed 100 millimetre X 100 millimetre metallic box complete with mudring and a 27 millimetre EMT conduit run from the top of the box and stubbed into the accessible ceiling space. Conduit stub will include bushing;

4.2.15.3 (11) ensure all horizontal and backbone cabling is run at a minimum 300 millimetres from lighting, power cables, motors, and other sources of high electromagnetic interference;

4.2.15.3 (12) ensure patch cords will be CAT6 UTP;

4.2.15.3 (13) provide patch panels for all network connections plus an additional 20% for spare; and

4.2.15.3 (14) ensure that passive components that are part of the structured cabling system, including but not limited to, patch panels, cabling, jack inserts, and face plates are covered by a manufacturer's warranty against defects in material and workmanship for a period of 25 years from the date of installation, at the original installation location.

4.2.15.4 Telephone

The Design-Builder will:

4.2.15.4 (1) provide a minimum of two RJ45 phone jacks and two RJ11 phone jack for:

- 4.2.15.4 (1) (a) each parent room;
- 4.2.15.4 (1) (b) each staff office;
- 4.2.15.4 (1) (c) each staff counter;
- 4.2.15.4 (1) (d) each Group unit;
- 4.2.15.4 (1) (e) each parent sign-in counter;
- 4.2.15.4 (1) (f) each program unit; and
- 4.2.15.4 (1) (g) as per the Childcare Centre Room Data Sheets.

4.2.15.4 (2) provide a minimum of one RJ45 phone jack for:

- 4.2.15.4 (2) (a) the fax machine in the main office;
- 4.2.15.4 (2) (b) the intrusion alarm panel;
- 4.2.15.4 (2) (c) the fire alarm panel; and
- 4.2.15.4 (2) (d) as per the Childcare Centre Room Data Sheets;

4.2.15.4 (3) provide a minimum of one RJ11 phone jack for:

- 4.2.15.4 (3) (a) the fax machine in the main office;
- 4.2.15.4 (3) (b) the intrusion alarm panel;
- 4.2.15.4 (3) (c) the fire alarm panel;
- 4.2.15.4 (3) (d) the emergency elevator phones; and
- 4.2.15.4 (3) (e) as per the Childcare Centre Room Data Sheets;

4.2.15.4 (4) coordinate all telephone locations with the Owner prior to rough-in;

4.2.15.4 (5) ensure all RJ45 telephone jacks are connected back to the telecommunication room using Category 6 UTP and terminated on a patch panel;

4.2.15.4 (6) ensure all RJ11 telephone jacks are connected back to the telecommunication room using Category 3 copper and terminated on a BIX;

4.2.15.4 (7) ensure all RJ11 telephone jacks are connected back to the telecommunication room using Category 3 UTP and terminated on a BIX block; and

4.2.15.4 (8) IP PBX will be supplied and installed by the Owner;

4.2.15.4 (9) ensure the telephone system is connected to the PSTN. Ensure all connectivity requirements with the service provider for a fully functioning telephone system.

4.2.15.5 CATV

4.2.15.5 (1) The Design-Builder will provide one RG6 outlet (coordinate with the Owner) for each of:

4.2.15.5 (1) (a) the activity rooms;

4.2.15.5 (1) (b) the parent's rooms;

4.2.15.5 (1) (c) the offices;

4.2.15.5 (1) (d) the staff rooms; and

4.2.15.5 (1) (e) the flat screen television locations.

4.2.15.6 Data Drops

The Design-Builder will:

4.2.15.6 (1) ensure data drops are not clustered at a single point in a room. Regardless of the quantity of outlets, the design will provide the widest and most flexible coverage of the room;

4.2.15.6 (2) ensure that data drops are ganged together with power outlets when possible to form a multiple gang outlet;

4.2.15.6 (3) provide two CAT6 data drops for each piece of equipment requiring connections to the Childcare Centre network. This equipment will include, but is not limited to:

4.2.15.6 (3) (a) computers;

4.2.15.6 (3) (b) printers;

4.2.15.6 (3) (c) DDC Control panels;

4.2.15.6 (3) (d) flat screens (TVs); and

4.2.15.6 (3) (e) access control and security equipment;

4.2.15.6 (4) in addition to all other locations, provide data outlets (two (2) CAT6 data drops per outlet) in the following spaces:

4.2.15.6 (4) (a) minimum two in each office;

4.2.15.6 (4) (b) minimum two in each staff room;

4.2.15.6 (4) (c) minimum two in each activity room;

4.2.15.6 (4) (d) minimum one in each parents' room at 1.1 metres; and

4.2.15.6 (4) (e) minimum one with a fixed IP address for DDC controls;

4.2.15.6 (5) provide data drops as per the Childcare Centre Room Data Sheets;

4.2.15.6 (6) install data drops as follows:

4.2.15.6 (6) (a) terminate all conductors of all cables on receptacles (RJ45 jack inserts);

4.2.15.6 (6) (b) ensure cables from each voice and data receptacle (RJ45 jack insert) in each outlet are homerun to the data rack installed within the Childcare Centre without splices or taps;

4.2.15.6 (6) (c) ensure cable length will not exceed 80 metres; and

4.2.15.6 (6) (d) provide all outlet faceplates with four RJ45 jack insert locations. Any unused jack insert locations will be provided a blanking plate.

4.2.15.6 (7) label data drops at minimum on the faceplate, inside the junction box, on cable jacket on both ends and on the patch panels where they terminate with a label maker; and

4.2.15.6 (8) provide one Cat6 ceiling mounted data outlet for each 10SM of floor area in the Childcare Centre for wireless access points. These data drop counts are separate from those provided as per the Childcare Centre Room Data Sheets.

4.2.15.7 Data Cabinet and Equipment

The Design-Builder will:

4.2.15.7 (1) provide one Panduit E6412B2 or approved alternative cabinet for networking equipment;

4.2.15.7 (2) provide one fibre enclosure for terminating of fibre optic cabling from the School main telecommunications room. Located in the top of the rack. Design-Builder will provide all necessary components for a complete fully functional fibre backbone system;

4.2.15.7 (3) provide patch panels placed above and below each required switch (switch supplied by others). A minimum of 20% unused spare ports will be provided;

4.2.15.7 (4) provide one Panduit or approved equal horizontal cable manager for every two patch panels required;

4.2.15.7 (5) provide one 1.5kVA uninterruptable rack-mounted power supply (UPS), 120V, 2U located in the bottom position of the rack. UPS will be APC or approved equal. Provide one dedicated L5-15R receptacle for the UPS;

4.2.15.7 (6) provide one rack power distribution unit (PDU) c/w fourteen 5-15R receptacles to be mounted on the back of the rack; type APC or approved equal. PDU will be powered via the UPS; and

4.2.15.7 (7) provide two dedicated 5-15R quad receptacle adjacent to the data rack, one on each side.

4.2.16 Security

4.2.16.1 General

The Design-Builder will:

4.2.16.1 (1) provide UPS or battery back-up power for a fully operational access control and intrusion alarm system for duration of one (1) hour upon power failure; and

4.2.16.1 (2) provide a dedicated a 120V, 15A duplex receptacle next to the access control panels and another next to the intrusion panels.

4.2.16.2 Access Control

The Design-Builder will:

4.2.16.2 (1) provide a complete and fully functional access control system including CPU;

4.2.16.2 (2) provide a complete and functional, enclosed raceway system for access control wiring. The raceway system will include all necessary conduit, tubing, duct, wireway, fittings, fasteners, clamps, adapters, device boxes, pull boxes, control panel enclosures, supports, hangers, bonding conductors, bonding connectors, and pull cords;

4.2.16.2 (3) use approved access control system manufacturer: Keyscan System (will be compatible with Aurora software);

4.2.16.2 (4) use approved card readers: HID RP series or approved equal;

4.2.16.2 (5) provide complete programming and commissioning of the access control system in consultation with the Owner;

4.2.16.2 (6) provide Keyscan Netcomm2P TCP/IP adapters where required;

4.2.16.2 (7) provide each door requiring access control with at minimum the following:

- 4.2.16.2 (7) (a) one card reader;
- 4.2.16.2 (7) (b) one request-to-exit device (with sounder);
- 4.2.16.2 (7) (c) one local alarm (piezo-sounder) with override switch for doors that exit the Childcare Centre and those identified in this Section;
- 4.2.16.2 (7) (d) one set panic hardware with 15 second delay and integrated request-to-exit button for doors leading to emergency exit stairwells;
- 4.2.16.2 (7) (e) one pair of door position switches (4-wire for dual use for intrusion system);
- 4.2.16.2 (7) (f) one electric strike for single door applications; and
- 4.2.16.2 (7) (g) electric latch/rod retraction hardware complete with locking rods for double door applications; and
- 4.2.16.2 (7) (h) all wiring, conduit, junction boxes, straps, and hardware for a complete and fully functioning system;

4.2.16.2 (8) provide access control at the following doors:

- 4.2.16.2 (8) (a) entry doors to each Childcare Group or program area (including exterior entry doors);
- 4.2.16.2 (8) (b) entrance vestibule on level 1 and level 4;
- 4.2.16.2 (8) (c) each door location where an enterphone is installed;

4.2.16.2 (8) (d) entry doors leading to the Childcare Centre from stairwells;

4.2.16.2 (8) (e) elevator (card reader access to level 4);

4.2.16.2 (9) coordinate the access control system with the door hardware installed on each door to ensure the access control system will integrate seamlessly to each door installed with panic bars, automatic door openers or other additional hardware;

4.2.16.2 (10) provide Keyscan control panels with enough capacity to support all doors requiring access control plus 20%;

4.2.16.2 (11) install local alarm (piezo-sounder) and request-to-exit override buttons at all doors leading from main program room into lobbies, or other unsupervised spaces. Local alarm overrides will be installed for doors leading to playgrounds or similar areas;

4.2.16.2 (12) ensure local alarm is integrated with handicap push plates to sound alarm when door is opened where required;

4.2.16.2 (13) provide delayed egress devices and alarms with 15 second delay on all emergency exit doors;

4.2.16.2 (14) provide secure access to the elevator by the use of a card reader.

4.2.16.2 (15) ensure doors operated by power-assisted door operator buttons are controlled by secure access (card reader);

4.2.16.2 (16) install network jack and patch cord at Keyscan network adapter location;

4.2.16.2 (17) integrate the access control system with the enterphone system;

4.2.16.2 (18) any door with an enterphone will be considered to be a door requiring access control;

4.2.16.2 (19) integrate all card readers with elevators, handicapped operator buttons, and enterphone interfaces;

4.2.16.2 (20) ensure the access control system is connected to the off-site centralized monitoring system, and coordinated with the Owner.

4.2.16.2 (21) provide pass cards / fobs or keypad controlled from Childcare Centre as follows: 15 cards or fobs per program Group plus an additional 207 pass cards/fobs;

4.2.16.2 (22) integrate the access control system with the fire alarm system to allow egress in the case of an emergency or fire;

4.2.16.2 (23) ensure the access control system will integrate seamlessly into the City of Vancouver’s remote server and network;

4.2.16.2 (24) provide all components (i.e. Kantech, IP link, and VC-485) for connection to the CoV LAN/WAN where required. Provide all programming and commissioning in consultation with the Owner; and

4.2.16.2 (25) deliver to the Owner the following deliverables as completed:

- 4.2.16.2 (25) (a) the model and serial number of each Keyscan control panel;
- 4.2.16.2 (25) (b) the physical location of each control panel (marked on drawing set);
- 4.2.16.2 (25) (c) input and output descriptions for each control panel;
- 4.2.16.2 (25) (d) a list of peripheral devices connected to each control pane;
- 4.2.16.2 (25) (e) the type of communication modules and adapters installed; and
- 4.2.16.2 (25) (f) the physical location of the network adapters.

4.2.16.3 Intrusion Alarm

The Design-Builder will:

- 4.2.16.3 (1) provide a complete and fully functional intrusion alarm system;
- 4.2.16.3 (2) provide a complete and functional, totally enclosed raceway system for intrusion alarm wiring. The raceway system will include all necessary conduit, tubing, duct, wireway, fittings, fasteners, clamps, adapters, device boxes, pull boxes, control panel enclosures, supports, hangers, bonding conductors, bonding connectors, and pull cords;
- 4.2.16.3 (3) ensure the intrusion alarm system will be of the type Ademco Vista or approved equal;
- 4.2.16.3 (4) provide keypads at all lobby entries and all program entries;
- 4.2.16.3 (5) program and commission intrusion alarm zones in consultation with the Owner;
- 4.2.16.3 (6) ensure intrusion alarm system include a dialer capable of connecting to the remote alarm monitoring company approved by the Owner;
- 4.2.16.3 (7) install PIR motion sensors at all entrance, exits and easily accessible window areas in the Childcare Centre; and
- 4.2.16.3 (8) install door position switches at all entrances, exits and easily accessible windows in the Childcare Centre.

4.2.16.4 Enterphones

The Design-Builder will:

4.2.16.4 (1) provide a complete and fully functional enterphone system;(including CPU). Exact intercom door station models and master control station models to be specified by the Owner. The enterphone system includes but is not limited to:

- 4.2.16.4 (1) (a) exterior intercom terminals;
- 4.2.16.4 (1) (b) interior intercom terminals;

4.2.16.4 (1) (c) intercom servers as required;

4.2.16.4 (1) (d) all software, programming and commissioning; and

4.2.16.4 (1) (e) intercom control master station.

4.2.16.4 (2) provide a complete and functional, enclosed raceway system for enterphone wiring. The raceway system will include all necessary conduit, tubing, duct, wireway, fittings, fasteners, clamps, adapters, device boxes, pull boxes, control panel enclosures, supports, hangers, bonding conductors, bonding connectors, and pull cords;

4.2.16.4 (3) provide a video enterphone system that will link the entrance on level 1 and the elevator used to access the Childcare Centre to each Group separately within the Childcare Centre to allow for remote door release and remote elevator access to level 4. Exterior answer stations will be weather-proof with keyed lock boxes;

4.2.16.4 (4) program and commission the enterphone system to suit the Owner's Requirements;

4.2.16.4 (5) ensure all enterphones utilize audio and video. Quantity and types of buttons will be coordinated with the Owner prior to purchasing;

4.2.16.4 (6) locate enterphone stations at locations including the following:

4.2.16.4 (6) (a) entry/exit doors from exterior areas to each Group or Program (one inside and one outside of door);

4.2.16.4 (6) (b) each Group outdoor play area (one exterior answer station per Group);

4.2.16.4 (6) (c) each staff counter (one answer station in each Group);

4.2.16.4 (6) (d) exterior side of entry vestibules on level 1 and level 4; and

4.2.16.4 (6) (e) the elevator on level 1;

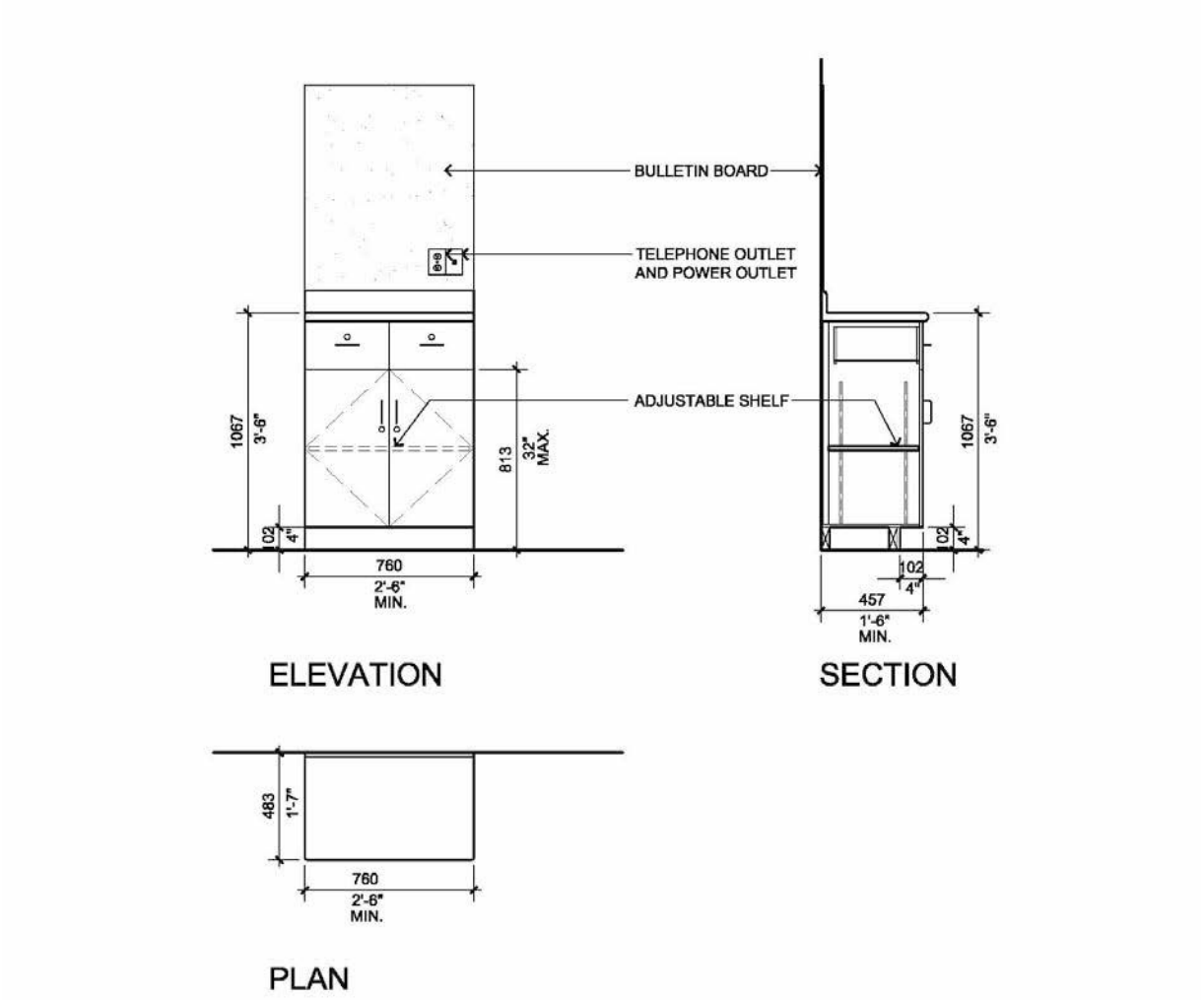
4.2.16.4 (7) provide remote release capabilities for all doors that utilize enterphones. This includes release or opening of a handicap door operated door;

4.2.16.4 (8) integrate the enterphone system with the elevator as to provide access to the Childcare Centre via the elevator without the use of a keycard; and

4.2.16.4 (9) ensure the enterphone system will be fully integrated and compatible with the Keyscan access control system.

4.3 MILLWORK REFERENCE

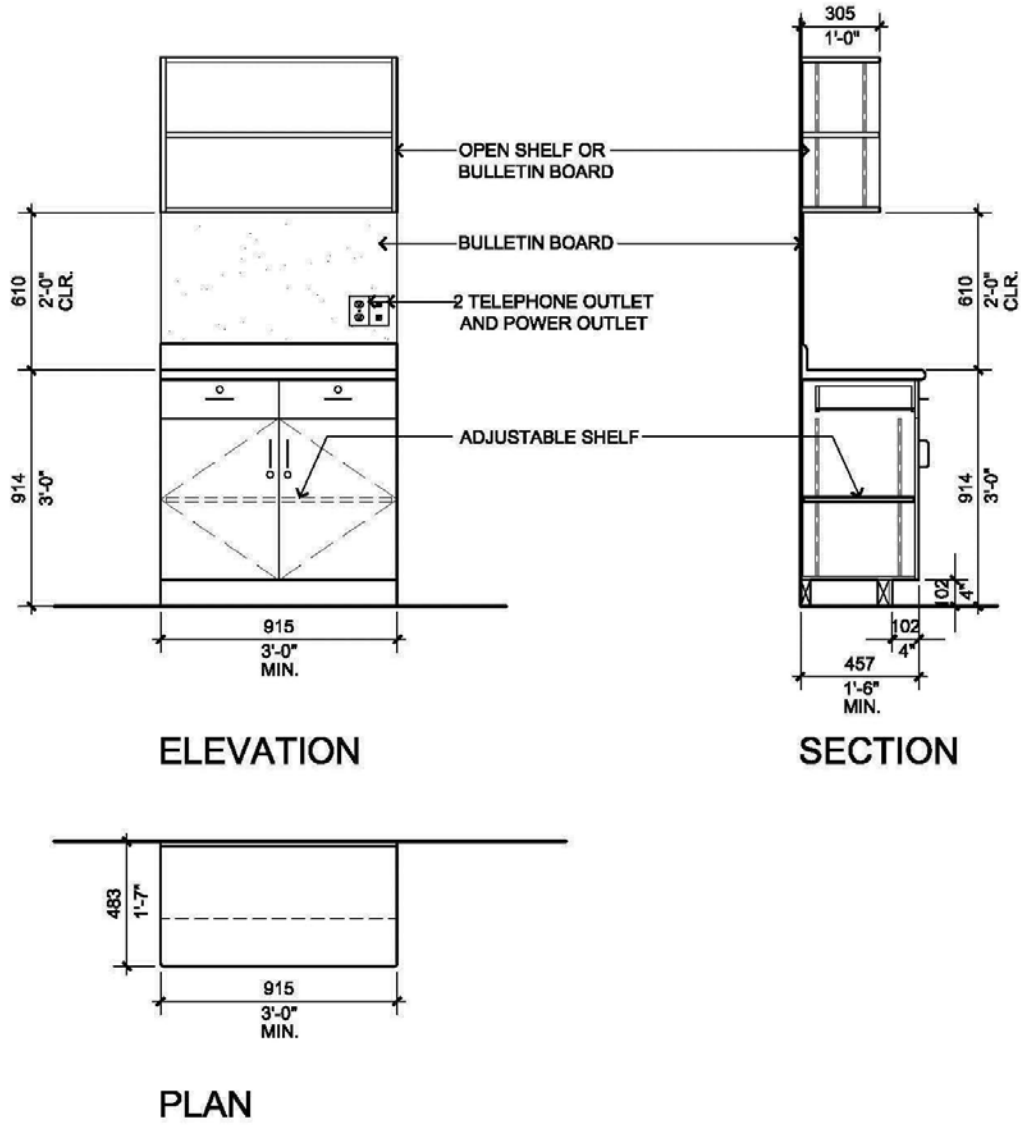
4.3.1 Parent's Sign-in Desk



Millwork Diagram 1: Parent's Sign-in Desk

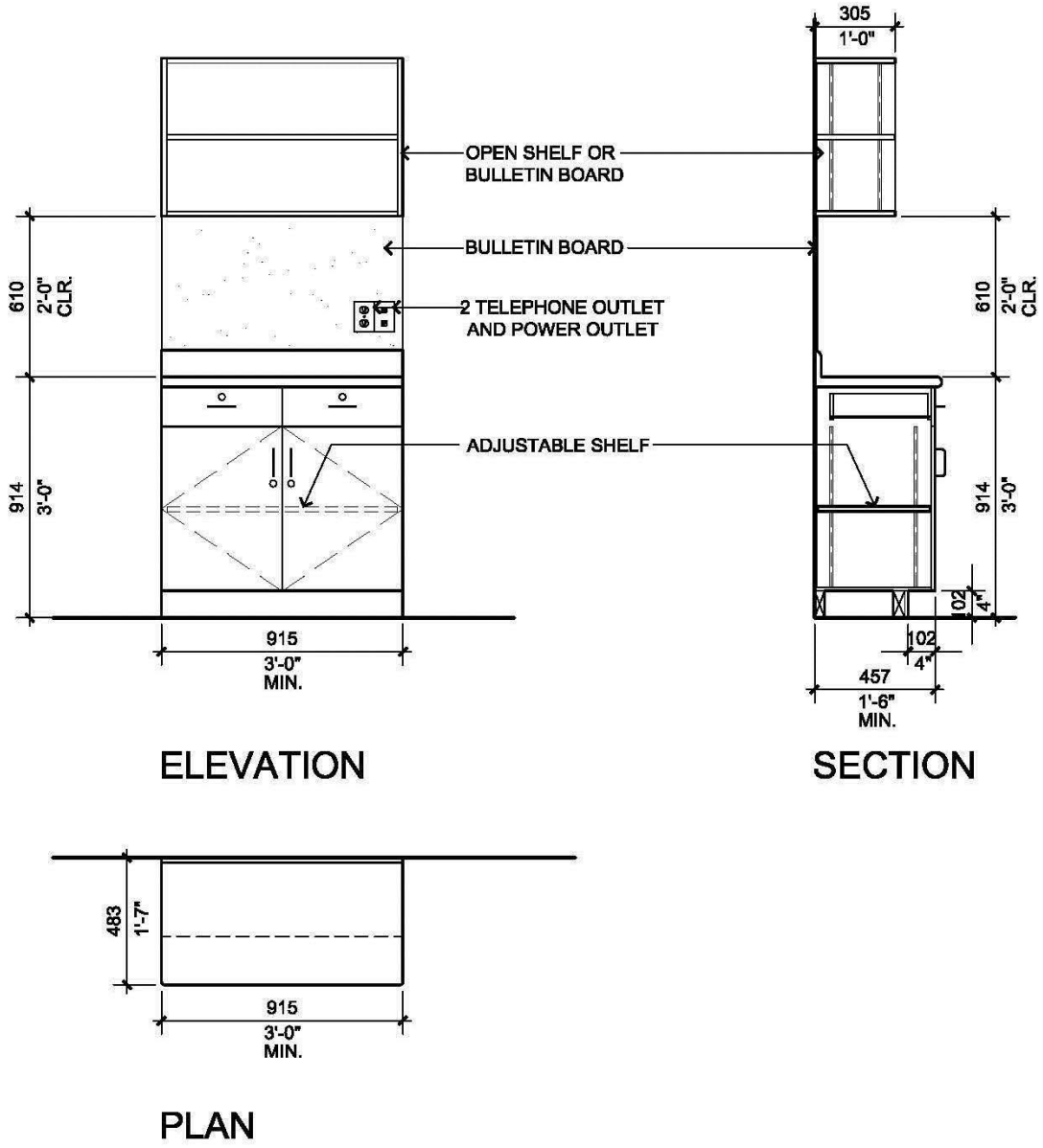
Note:
- Pull-out shelf to be provided for handicap accessibility.
- Provide 915 millimetre high countertop.

4.3.2 Parent Room Display



Millwork Diagram 2: Parent Room Display

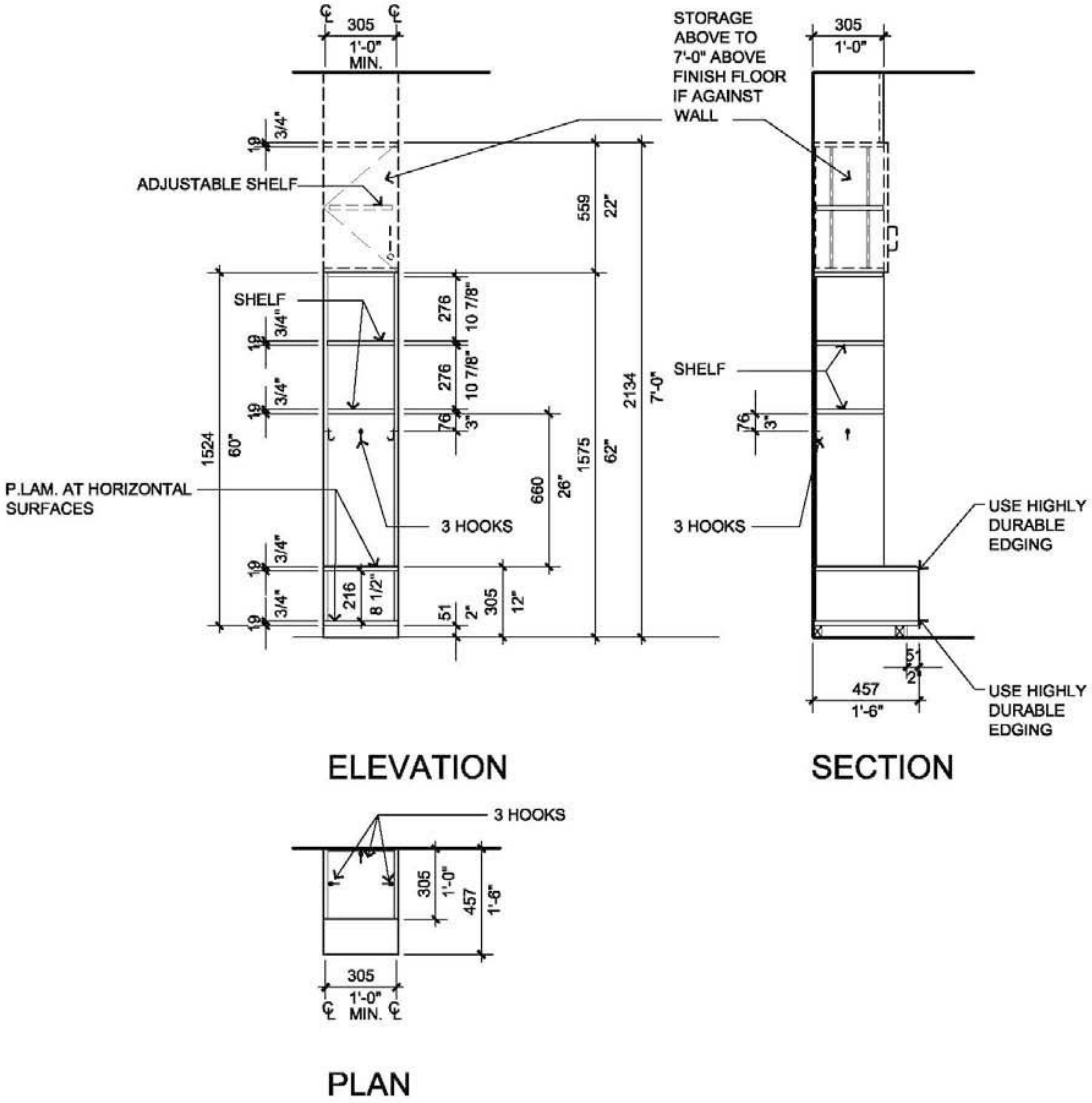
4.3.3 Staff Counter



Millwork Diagram 3: Staff Counter

Note:
- Corkboard with trim above staff counter.
- Provide two (2) telephone outlets.

4.3.4 Cubbies at Toddler / Infant Groups

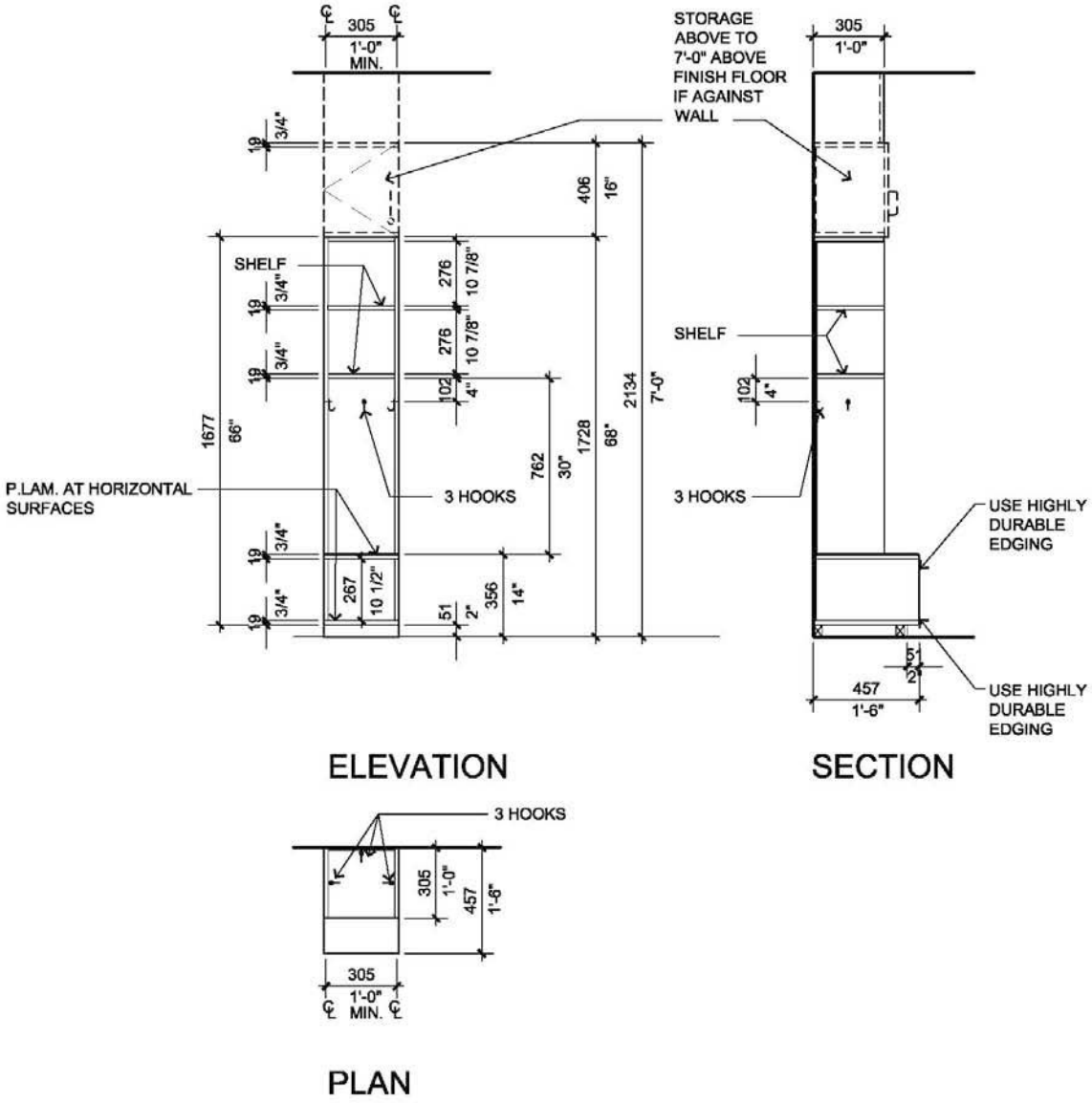


Millwork Diagram 4: Cubbies at Toddler / Infant Groups

Note:

- Provide three (3) hooks (with rounded ends) per cubby.
- Seal joints at P.LAM horizontal surfaces.

4.3.5 Cubbies at Preschooler Group

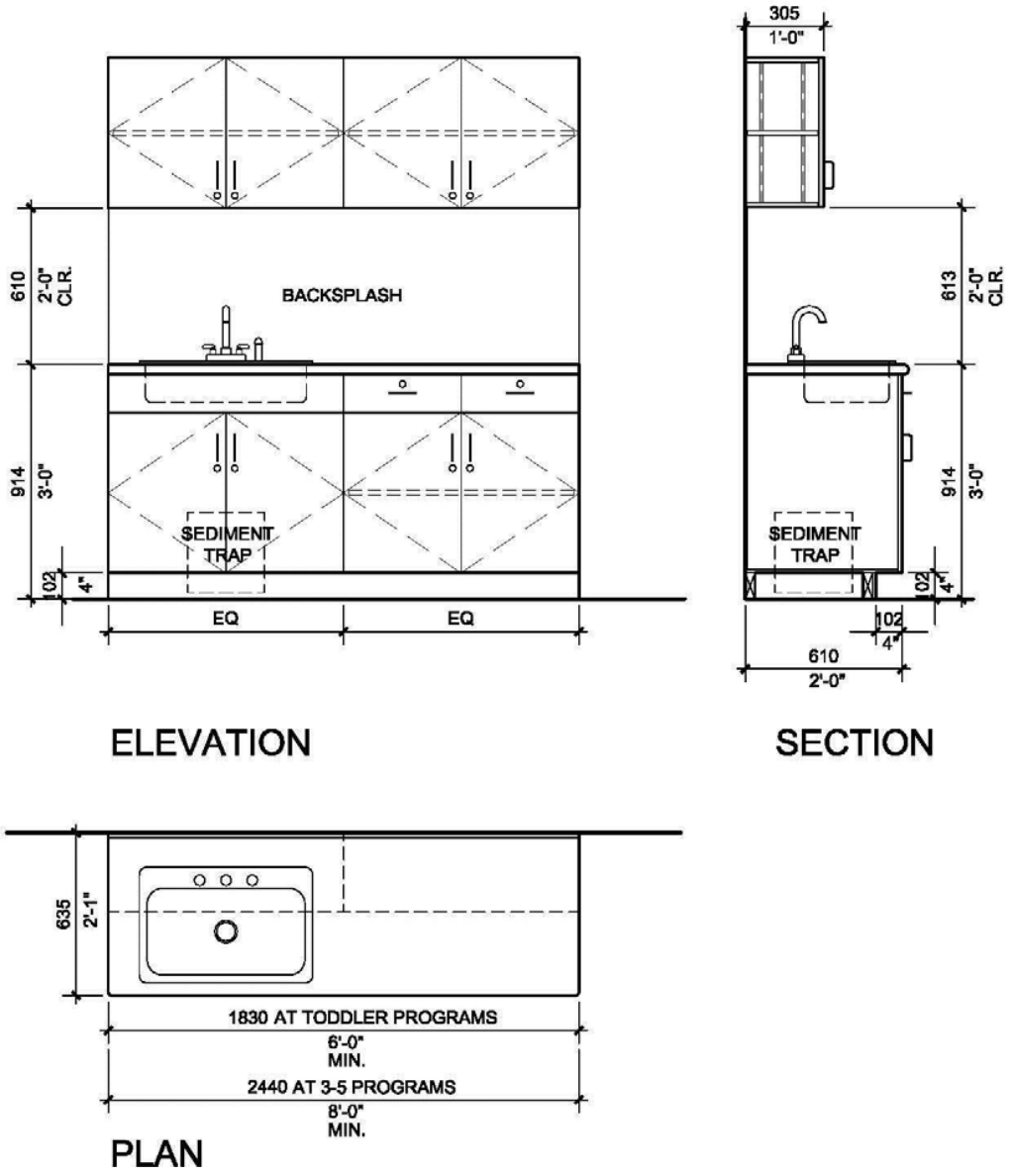


Millwork Diagram 5: Cubbies at Preschooler Group

Note:

- Provide three (3) hooks (with rounded ends) per cubby.
- Seal joints at P.LAM horizontal surfaces.

4.3.6 Art Counter

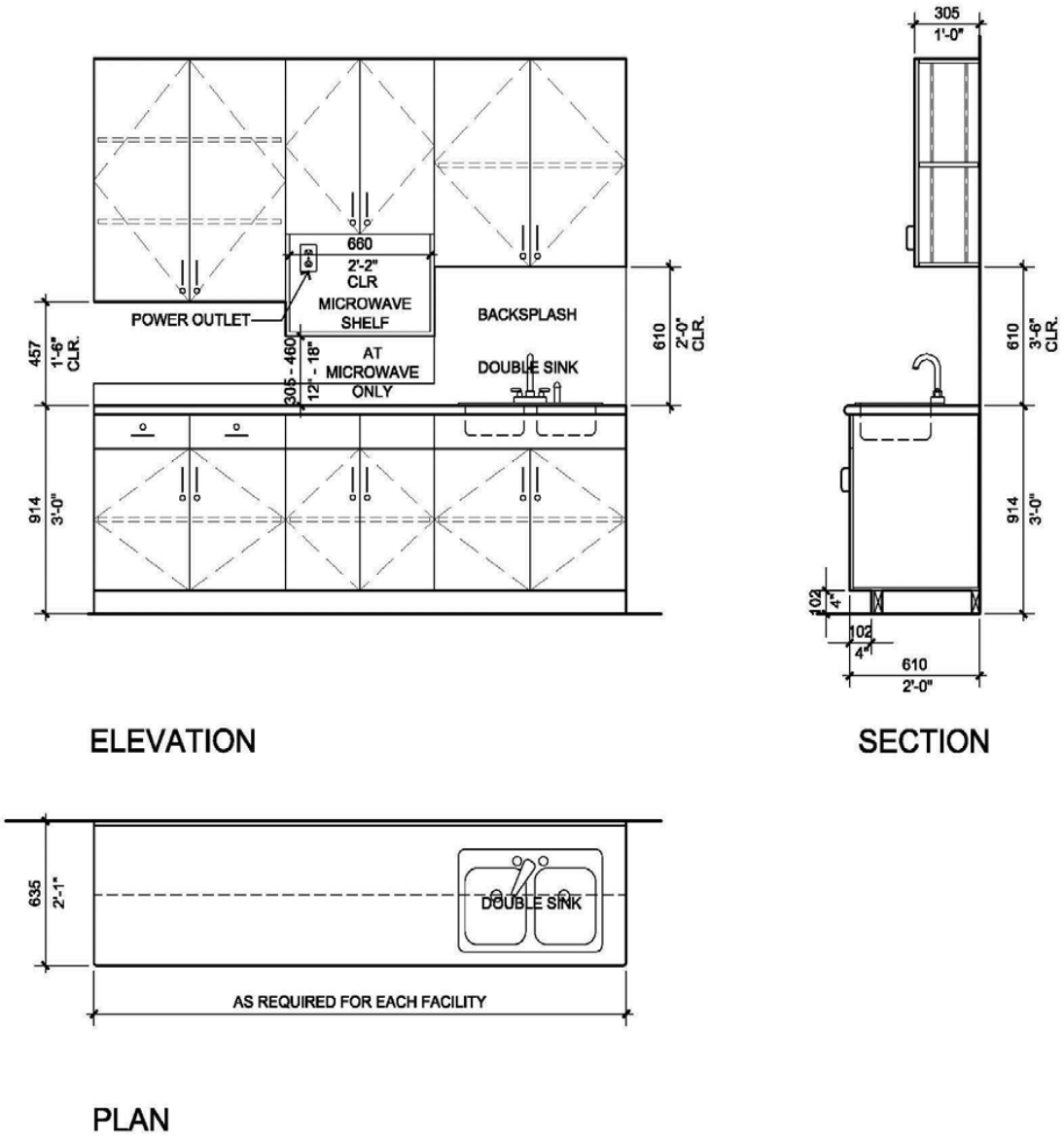


Millwork Diagram 6: Art Counter

Note:

- Backsplash to be continuous to underside of cabinets.
- Art drying rack will be incorporated.
- Closed cabinets are required for upper millwork above art counter.
- Below art counter, use closed cabinets below sink. Other millwork below counter, use a combination of closed cabinets and a bank of drawers.

4.3.7 Kitchen

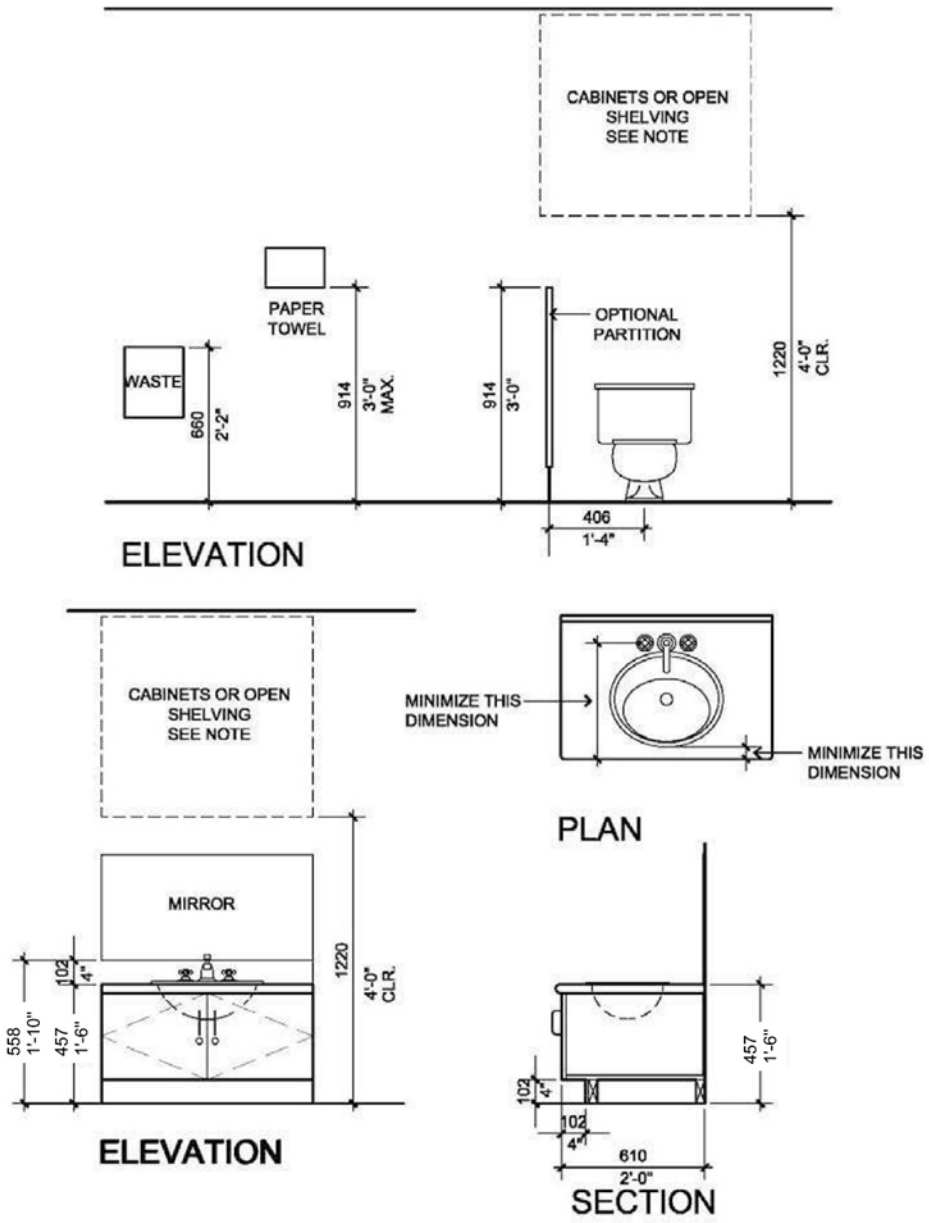


Millwork Diagram 7: Kitchen

Note:

- Kitchen will include a separate hand sink. Do not locate adjacent to double sink.
- Upper cabinets to be 0.61 metres clear above all sinks; full height backsplash to underside of cabinets above at double sink minimum.
- Place power outlet at MW so the plug does not push the MW forward.
- Use three (3) shallow drawers to accommodate cutlery and small items and one (1) deeper drawer on the bottom.

4.3.8 Washrooms for Infant / Toddler Groups

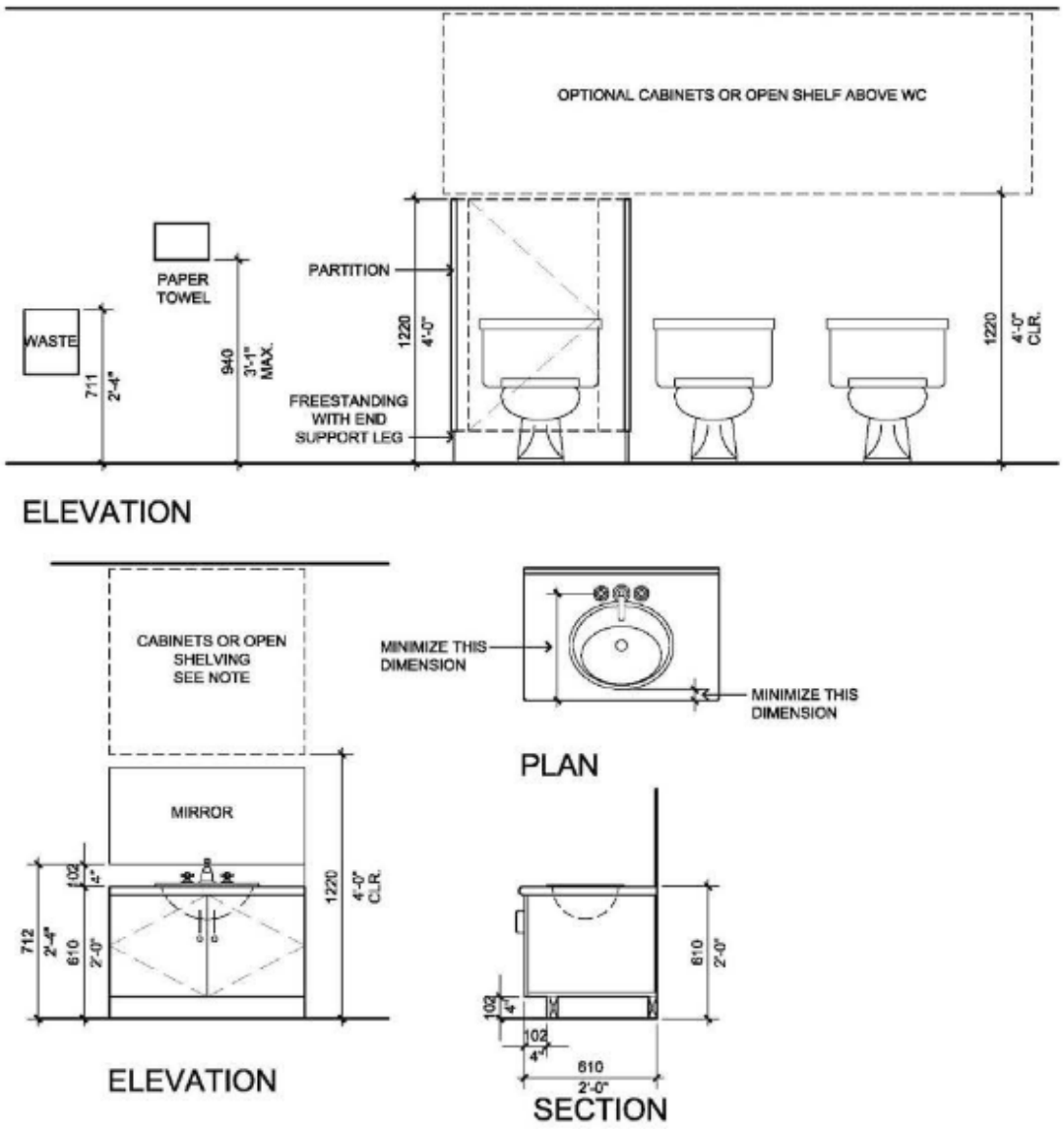


Millwork Diagram 8: Washrooms for Infant / Toddler Groups

Note:

- Open shelving is required for all the upper cabinetry above sinks and/or toilers. Open shelves will be adjustable to accommodate a range of basket sizes. Depth of shelves to range from 254 to 305 millimetres.
- Washroom partitions can be prefabricated.

4.3.9 Washrooms for Preschooler Group and Preschool

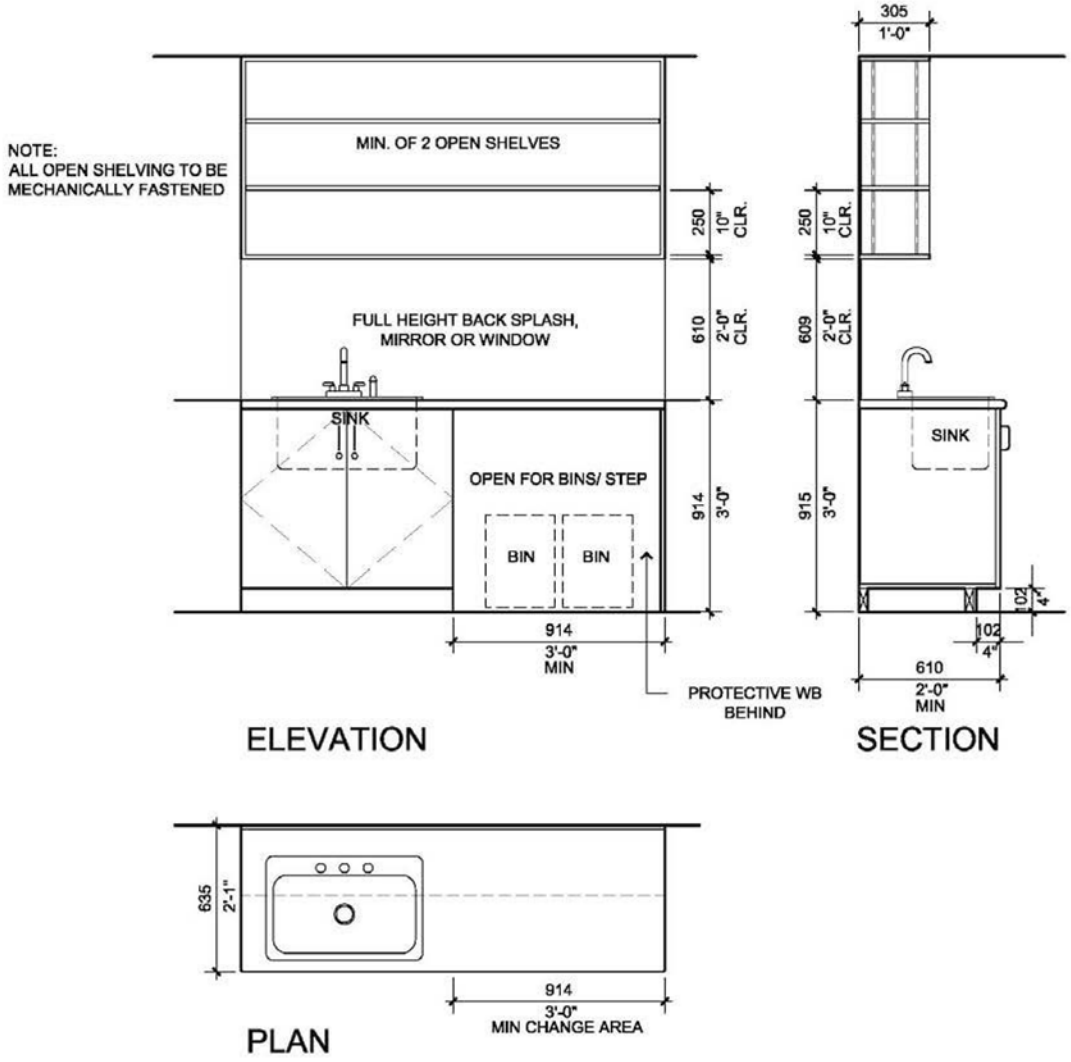


Millwork Diagram 9: Washrooms for Preschooler Group and Preschool

Note:

- Open shelving is required for all the upper cabinetry above sinks and/or toilets. Open shelves will be adjustable to accommodate a range of basket sizes. Depth of shelves to range from 254 to 305 millimetres in depth.
- Washroom partitions can be prefabricated.
- One (1) toilet to be enclosed.
- Screen plumbing below sinks to prevent children's access but provide easy access for maintenance.

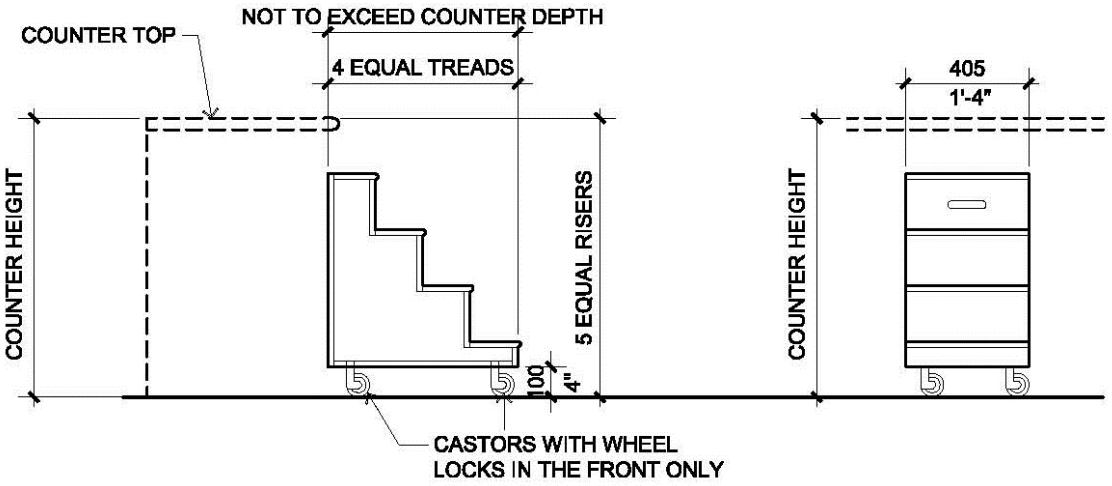
4.3.10 Change Table



Millwork Diagram 10: Change Table

Note:
- Sink to be 300 millimeters deep.
- Hand-held spray attachment to be provided at sink.

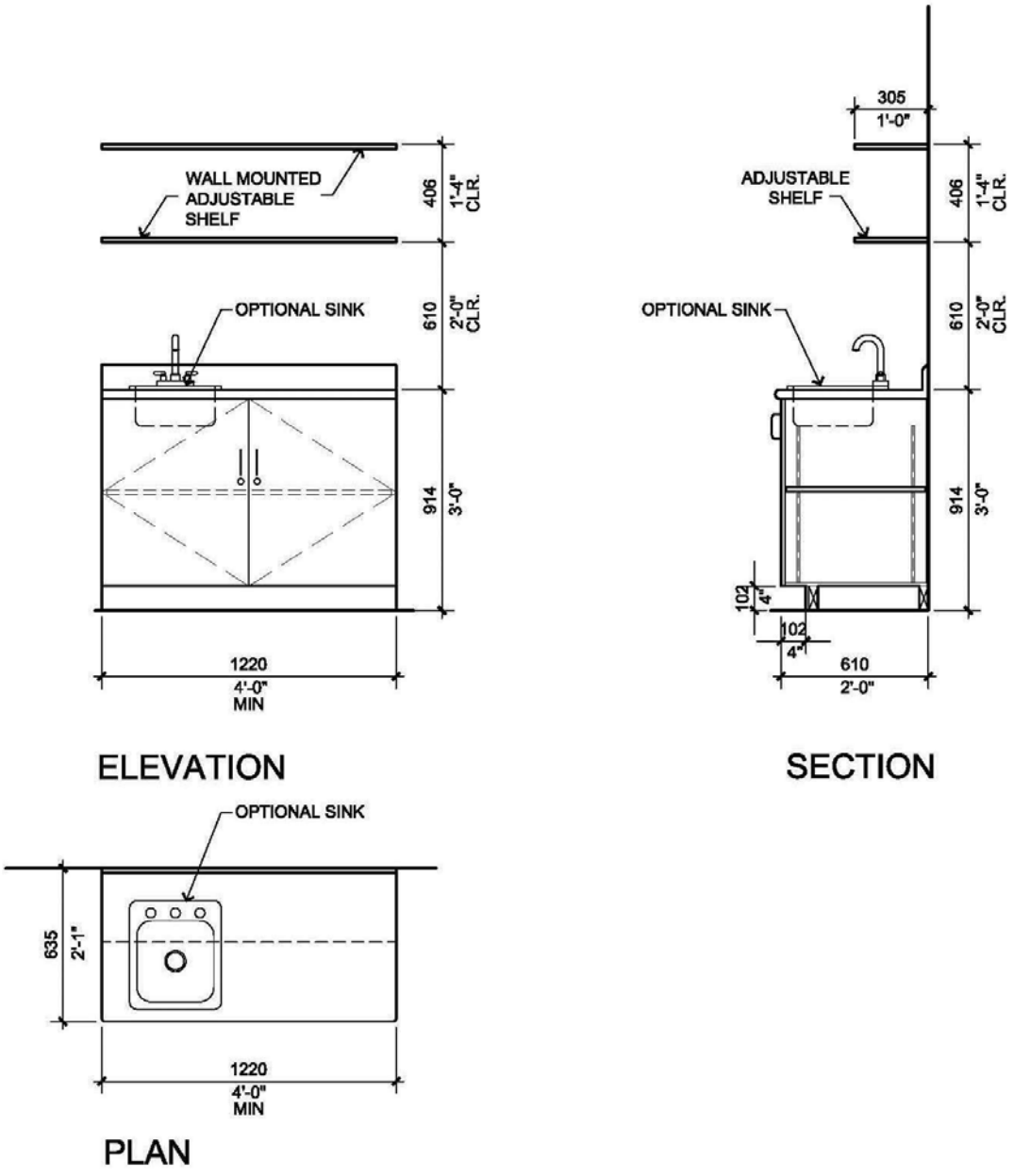
4.3.11 Steps at Change Table



Millwork Diagram 11: Steps at Change Table

Note:
- Steps may be on glides or castors.
- A locking mechanism is required to ensure steps are immobilized when in use.
- Alternatives to AWMAC requirements, such as 12 millimetres plywood at the sides may be used in order to reduce the weight of the steps.
- Provide hand grips for ease of pulling steps out from under the counter.

4.3.12 Laundry Counter

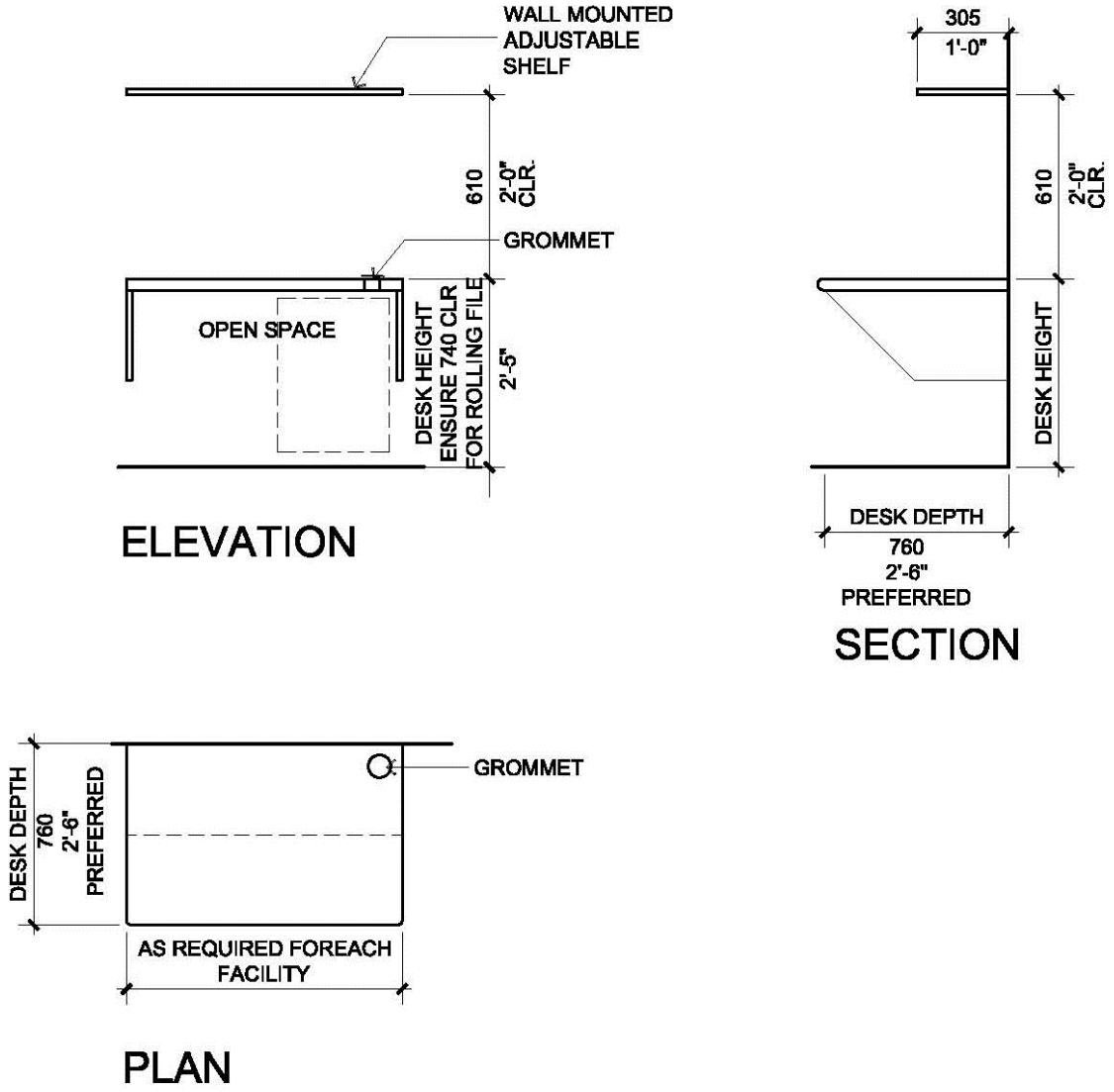


Millwork Diagram 12: Laundry Counter

Note:

- Sink is required for each laundry room.
- Lockable cabinets are preferred under the counter.

4.3.13 Staff Office

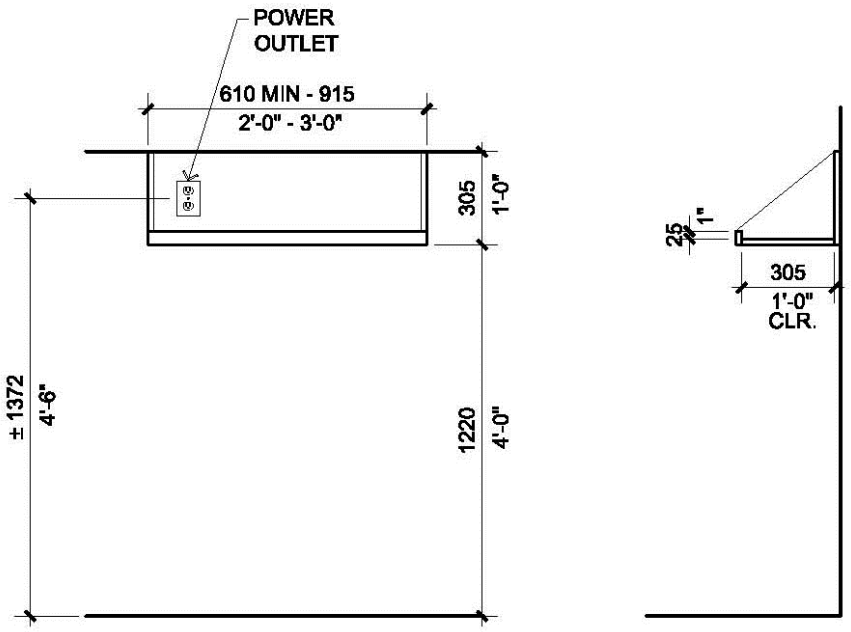


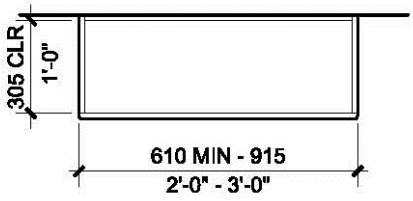
Millwork Diagram 13: Staff Office

Note:

- Minimum two (2) grommets are required on the desk.

4.3.14 Music Shelf



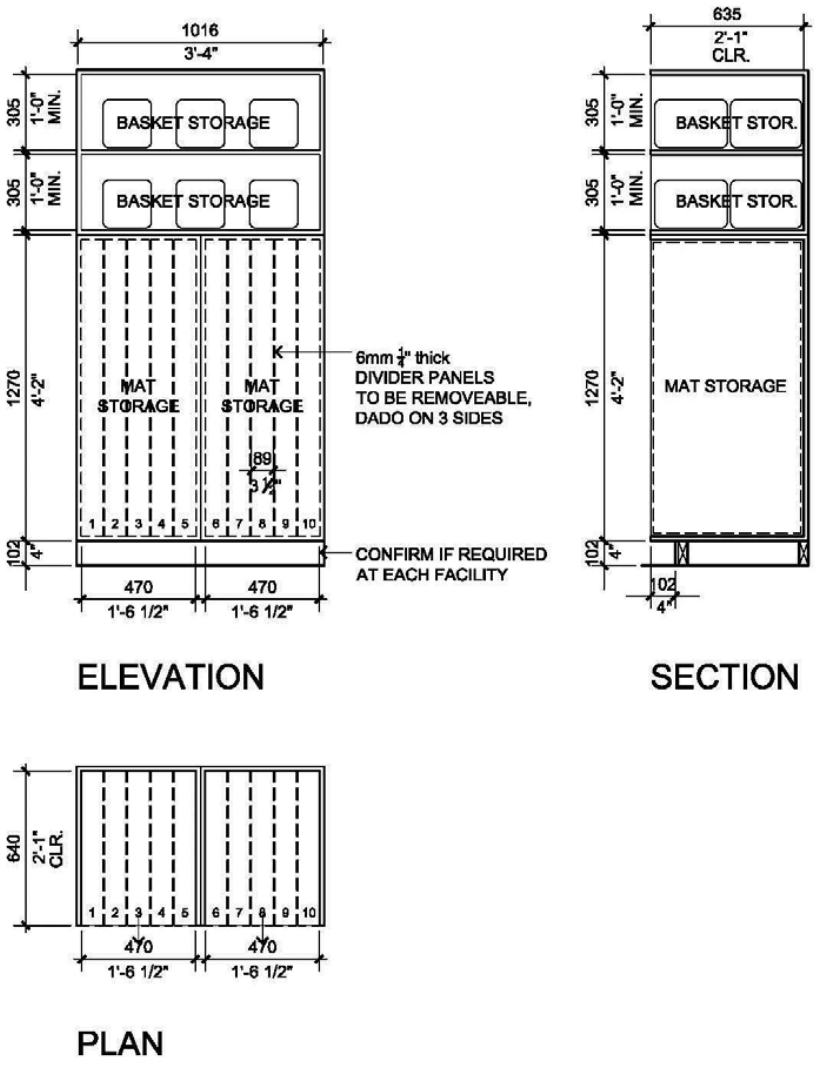


Millwork Diagram 14: Music Shelf

Note:

- Radius corners when corners are not against a wall.

4.3.15 Sleep Mat Storage



Millwork Diagram 15: Sleep Mat Storage

Note:
- Dividers panels to be removable for cleaning.
- Individual mat size 0.75 metres W x 0.61 metres D x 1.22 metres H.
- Number of mats = number of required basket storage.

Appendix 1E(A) Childcare Centre Room Data Sheets

See separate document.

Appendix 1E(B) Childcare Centre Systems Scope Responsibility Matrix

See separate document.

Department:	**15 - Childcare 01 - Infant**		
Minimum Area:	**56.00**	*Ceiling Height:* **2440.00**	

Room Design Requirements

General Design Requirements

Critical Adjacencies

Adjacent to outdoor covered area, with a view to outdoor play spaces.

Zone the activity settings such that noisy and quiet, intense and calm and messy (or wet) and tidy activities are separated. These zones will be shown on submitted plans.

The messy/wet zone will be used for art activities and eating and will be located adjacent to the kitchen and to the outdoor play area so that on sunny days, doors can be open and activities can flow between indoor and outdoor areas. There will be enough space for art/eating tables, easels, water and texture tables, and storage. Enough space is required to seat all children at once for snacks and meals.

Design Features

Large settings such as dramatic play and large blocks, will be represented in planning by a 3.0 metres diameter circle. Small settings for intense activities such as puzzles will be represented by a 2.0 metres diameter circle (size varies by age group and activity). Movement activities require a dedicated area which will include convenient storage for wheeled toys, large blocks, musical instruments, and climbing equipment.

An irregular square with alcoves and nooks is a suitable shape for the room. Avoid long narrow rooms. The plan will direct children from one activity to the next and delineate, protect and support activities in each setting.

Circulation within an activity room will be clear and straightforward, but not overly simplified and uninteresting. The optimum circulation path is highly visible and snakes through space, overlooking each activity. "Shopping" among activities is itself an activity. Circulation paths will respect the boundaries of activity areas by meandering around but not passing through activity settings. Allow space for children engaged in activities to play uninterrupted by others passing by them.

Room Finishes

Floor Finishes	
Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*
Ceiling Finishes	
Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*
Wall Finishes	
Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Wall Protection	
Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Notice boards or other strategy is required for the display of children's projects.

Millwork:

- Staff Counter - refer to Section 4.3.3 for CAD drawings and dimensions.

- Art counter with sink: min. 1.8 metres long in Infant Activity Room - refer to Section 4.3.6 for CAD drawings and dimensions. - Provide backsplash min 0.6 metres high or to underside of cabinets above.

Accessories:

- Paper towel dispensers to accommodate single-fold towels with no saw tooth cutting bar - Provide 1 at each art sink.

- Soap dispensers: Provide one wall-mounted soap dispenser at each sink.

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑
Notes	☑ *Hot water to be temperature adjustable 38-40 degrees Celsius (max 49 degrees Celsius).*

Sink Types

Other	☑ *Art sink: to be stainless steel complete with a faucet ledge. 0.30 metres deep sink. Gooseneck faucet with handspray. Provide a floor mounted Zurn sediment trap at (Z1180 Solids Interceptor) all art sinks.*

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*
Remarks	*Individual room temperature control. CO2 monitoring through BMS.*

Electrical Requirements

Power

General Power	
	For electrical requirements regarding access control refer to Appendix 1E - 4.2.16.2 (7).
	For requirements regarding local alarm and RTE buttons see Appendix 1E - 4.2.8.4 (9) and 4.2.8.4 (10).
Duplex Min. Qty	*6* As per Appendix 1E - 4.2.14.1
Other Duplex Min. Qty	*1* Above counter, adjacent to telephone outlet.
	To be coordinated with staff counter.

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 2*
Data	☑ *CAT6 Drop Min Qty: 4*
Remarks	*Two (2) CAT6 drops at staff counter for IP phones (coordinate with millwork). Two (2) CAT3 drops at staff counter for analog phones (coordinate with millwork). RG6 cable outlet.*

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (a) 320 lux min*

Lighting Control

Multi-Level	☑ *As per Appendix 1E - 4.2.14.4 (2)*
Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Doors to be fully glazed with tempered glass. - Swing doors or gates to have a hold open device such as a hook and eye, an “elephant’s foot” stop. or similar. -Kick plates are required on the push side of all doors with closers - kick plates minimum 0.30 metres high. - doors to have locks with 'classroom' function -Painted doors and door frames to be G5 'Gloss Level' (semi-gloss). - At all entrances from the outdoors provide walk-off mats (minimum size will allow for an adult to take two steps before stepping onto another flooring surface). - Blinds required on door glazing (and secured on bottom with child-safe device). - Child-proof thumb-turn deadbolt on all non-emergency exit doors to exterior is required. - flush-bolt at top and bottom for inactive leaf is required. - For requirements for Hardware and security, refer to Appendix 1E-Childcare Centre Requirements sections 4.2.8.4 - Hardware and 4.2.16.2 -Access Control, 4.2.16.3 - Intrusion Alarm and 4.2.16.4 - Enterphones .*

Windows

Exterior Window Required ☑ ☑ *Operable - Note, exterior windows in children’s areas will be at a height that children can see out. If at a height accessible to children , it must be screened and restricted to a max opening of 100 millimetres. If opening onto a walkway or play area , slider recommended.*

Window Covering Notes - *Blinds to be installed on all exterior windows. - All blinds to be commercial grade; chain operated roller style preferred. - All cords or chains to terminate 1.5 metres above the floor, or to be supported on a hook at that height.*

Department: **15 - Childcare 01 - Infant**

Minimum Area: **13.00** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

The gross motor/nap room will be designed to open to the activity room to enable shared use and to enhance flexibility.

The room will be located away from outdoor play areas.

Design Features

Nap room layout will allow for approximately 0.61 metres between cribs, mats or cots.

Will be adjacent to storage room for gross motor play items.

Additional Remarks

Provide space for children's personal storage (baskets with personal effects for each child in) in gross motor/nap room.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Carpet is required in all nap rooms - Base to be rubber, continuous throughout, and minimum 0.1 metres. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" painting For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Millwork:

Music shelves - refer to Section 4.3.14 - Music shelf for CAD drawings and dimensions.

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*
Remarks	*Individual room temperature control. CO2 monitoring through BMS.*

Electrical Requirements

Power

Duplex Min. Qty	*4* As per Appendix 1E - 4.2.14.1 (1) Child-proof and shatter-proof faceplates (TYP). As per Appendix 1E - 4.2.14.1 (3) Provide duplex receptacle at music shelf @ 1.327 metres AFF.

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 2*

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (a) 320 lux min*

Lighting Control

Multi-Level	☑ *As per Appendix 1E - 4.2.14.4 (2)*
Dimmer	☑ *As per Appendix 1E - 4.2.14.4 (3)*
Remarks	*As per Appendix 1E - 4.2.14.3. Provide dimmable wall sconces in addition to general lighting Switches located outside the room as per Appendix 1E - 4.2.14.4 (5) No un-switched lights (eg security lighting) as per Appendix 1E - 4.2.14.4 (4)*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Doors to be fully glazed with tempered glass. - Darkening blinds to be installed on nap room windows and on door glazing. Ensure blinds on doors are secured on the bottom with a child safe device. - Swing doors or gates to have a hold open device such as a hook and eye, an "elephant's foot" stop. or similar. -Kick plates are required on the push side of all doors with closers - kick plates minimum 0.30 metres high. - doors to have locks with 'passage' function -Flush bolts on inactive leaf are required.*

Windows

Window Covering Notes - *Darkening blinds to be installed on nap room windows and on door glazing. - All cords or chains to terminate 1.5 metres above the floor, or to be supported on a hook at that height.*

Department: **15 - Childcare 01 - Infant**

Minimum Area: **13.00** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

The gross motor/nap room will be designed to open to the activity room to enable shared use and to enhance flexibility.

The room will be located away from outdoor play areas.

Design Features

Nap room layout will allow for approximately 0.61 metres between cribs, mats or cots.

Will be adjacent to storage room for gross motor play items.

Additional Remarks

Provide space for children's personal storage (baskets with personal effects for each child in) in gross motor/nap room.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Carpet is required in all nap rooms - Base to be rubber, continuous throughout, and minimum 0.1 metres. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" painting For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Millwork:

Music shelves - refer to Section 4.3.14 - Music shelf for CAD drawings and dimensions.

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*
Remarks	*Individual room temperature control. CO2 monitoring through BMS.*

Electrical Requirements

Power

Duplex Min. Qty	*4* As per Appendix 1E - 4.2.14.1 (1) Child-proof and shatter-proof faceplates (TYP). As per Appendix 1E - 4.2.14.1 (3) Provide duplex receptacle at music shelf @ 1.327 metres AFF.

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 2*

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (a) 320 lux min*

Lighting Control

Multi-Level	☑ *As per Appendix 1E - 4.2.14.4 (2)*
Dimmer	☑ *As per Appendix 1E - 4.2.14.4 (3)*
Remarks	*As per Appendix 1E - 4.2.14.3. Provide dimmable wall sconces in addition to general lighting Switches located outside the room as per Appendix 1E - 4.2.14.4 (5) No un-switched lights (eg security lighting) as per Appendix 1E - 4.2.14.4 (4)*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Doors to be fully glazed with tempered glass. - Darkening blinds to be installed on nap room windows and on door glazing. Ensure blinds on doors are secured on the bottom with a child safe device. - Swing doors or gates to have a hold open device such as a hook and eye, an "elephant's foot" stop. or similar. -Kick plates are required on the push side of all doors with closers - kick plates minimum 0.30 metres high. - doors to have locks with 'passage' function -Flush bolts on inactive leaf are required.*

Windows

Window Covering Notes - *Darkening blinds to be installed on nap room windows and on door glazing. - All cords or chains to terminate 1.5 metres above the floor, or to be supported on a hook at that height.*

Department: **15 - Childcare 01 - Infant**

Minimum Area: **12.00** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions
A separate cubby area will be provided for each Group.

Critical Adjacencies
This area will be directly accessible to the washroom and to the outdoor covered play area. and it will open up to the main activity area.

The cubby area is best located immediately inside the entry used by children when using the outdoor play yard. This arrangement ensures that wet and muddy outer clothes and boots are not brought into the activity areas of the childcare.

Design Features
There will be open floor space for a group of eight children and one staff to get dressed for winter conditions separated from the activities of the other children.

At all entrances from the outdoors provide walk-off mats (minimum size will allow for an adult to take two steps before stepping onto another flooring surface). A child- safe recessed grille is preferred, surface walk-off mats are also acceptable.

Additional Remarks
Parents of Infants will enter through the cubby area so that shoes can be removed before entering areas where children are playing on the floor.

The entry sequence for Infant Group Daycare will be via the cubby area and from there to the primary activity space. This arrangement minimizes tracking wet and dirt into the childcare. This is important in Infant programs where children spend much of their time on the floor.

Provide space for children's personal storage (baskets with personal effects for each child in) in cubbies.

Storage for the program strollers can be separate from other program storage. Provide 2 spaces for program 3-position strollers. near Infant/Toddler cubbies is best:

The size of the strollers are 1.9 metres long by 0.6 metres wide by 1.0 metres high. Ensure circulation space from entrance to stroller storage accommodates the turning radius of the stroller.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Notice boards:

- Program Entry to have at least two Cork Boards - Minimum 0.91 metres W x 0.61 metres H to 1.52 metres W x 0.91 metres H. The larger the size that can be accommodated, the better.

- Also provide cork board above Parent's sign-in desk, coordinate with millwork.

Millwork:

- Parent sign-in desk - refer to Section 4.3.1 for CAD drawings and dimensions.

- Children's cubbies (number required equal to the licensed capacity plus an extra 20% for part-time children). 12 + 3 = 15 cubbies - refer to Section 4.3.4 for CAD drawings and dimensions.

- Hooks / space for staff coats and shoes: 4 per program Group. These need to be at or near cubbies.

- Half-height millwork gate. Minimum 25 millimetres clearance under door. Full length piano hinge is required. Swing doors or gates to have a hold open device such as a hook and eye, an "elephant's foot" stop. or similar.

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

General Power	For electrical requirements regarding access control refer to Appendix 1E - 4.2.16.2 (7) and 4.2.16.2 (8). For requirements regarding local alarm and RTE buttons see Appendix 1E - 4.2.8.4 (10).
Other Duplex Min. Qty	*1* Above counter, adjacent to telephone outlet. To be coordinated with parent's sign-in desk.

Lighting

Luminaire Type

LED ☑

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Doors to be fully glazed with tempered glass. - Swing doors or gates to have a hold open device such as a hook and eye, an "elephant's foot" stop. or similar. -Kick plates are required on the push side of all doors with closers - kick plates minimum 0.30 metres high. - doors to have locks with 'classroom' function. - At all entrances from the outdoors provide walk-off mats (minimum size will allow for an adult to take two steps before stepping onto another flooring surface). - For requirements for Hardware and security, refer to Appendix 1E-Childcare Centre Requirements sections 4.2.8.4 - Hardware and 4.2.16.2 -Access Control, 4.2.16.3 - Intrusion Alarm and 4.2.16.4 - Enterphones .*

Other Doors *Other* ☑ *half-height millwork gate*

Department:	**15 - Childcare 01 - Infant**		
Minimum Area:	**9.50**	*Ceiling Height:* **2440.00**	

Room Design Requirements

General Design Requirements

Activities and Functions

Two Groups can share one kitchen if it is readily accessible by both Groups.If kitchen is shared by two (2) Groups the total kitchen area will be at least 12 SM.

An open kitchenette (along a wall) is not permissible.

Critical Adjacencies
Kitchen will be directly accessible from main activity area.

Design Features
Kitchens may be located in an alcove within the primary activity space but separated from the activity room by a child-height counter. This permits children to be included in the kitchen activities without bringing them into the kitchen itself with its safety concerns. It also allows staff to supervise activities in the activity room while in the kitchen.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. - Ceiling finishes in kitchen must be washable. For general requirements for ceiling finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Magnetic White Board: Minimum 0.91 metres W x 0.91 metres H to 1.52 metres W x 0.91 metres H. The larger the size that can be accommodated, the better.

Millwork:

Kitchen - refer to Section 4.3.7 for CAD drawings and dimensions. - Provide backsplash min 0.6 metres high or to underside of cabinets above.

- Half-height millwork gate. Minimum 25 millimetres clearance under door. Full length piano hinge is required. Swing doors or gates to have a hold open device such as a hook and eye, an “elephant’s foot” stop. or similar.

- Potential counter at children's height.

-Accessories:

- Paper towel dispensers to accommodate single-fold towels with no saw tooth cutting bar - Provide 1 at each sink in kitchens.

- Soap dispensers: Provide one wall-mounted soap dispenser at each sink.

Equipment:

For general requirements for equipment refer to Appendix 1E -Childcare Centre Requirements section 4.2.11 - Equipment.

In case of sharing the kitchen with Toddler Group:

- Commercial style dishwasher with a sani-cycle, 70 degrees Fahrenheit heat booster, and back-flow preventer valve. Note that these dishwashers require deeper than standard millwork: millwork to be designed to suit. Moyer Diebel model #501HT with 70 degree F rise booster or approved equivalent.

- Stove with oven: 0.76 metres wide, with 4 burners; placement of controls to be suitable for child safety, for example at back; self-cleaning convection oven. (separate wall oven and range top are also acceptable). Whirlpool model #YWFE710HOBW or approved equivalent.

- Range hood to mechanically exhaust stove to the outside; exhaust rate (CFM) to be determined by HVAC engineer. GE model #JV635NWWC or approved equivalent.

- Microwave oven: 2.0 cubic feet, 1100 watt, minimum. Panasonic model #NNSN968W or approved equivalent.

- Each Program will require its own full-sized fridge in the kitchen(w/ Freezer)- 18.5 cubic feet, 0.76 metres W, and one upright freezer for each kitchen (20.1 cu ft) - this is shared between two programs, and can be in a storage room). Refrigerator to be Whirlpool model #EB9FVHXWQ or approved equivalent. Upright Freezer to be Whirlpool model #EV200NZTQ or approved equivalent.

In case of having a dedicated kitchen:

- All equipment same as above except:

No stove is required if there is a full kitchen serving other programs nearby in the Childcare Centre.

One full-size fridge (w/freezer) required - 18.5 cubic feet, 0.76 metres W - No separate freezer required.

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Handwash	☑ *Qty: 1*
Double	☑ *Qty: 1*

Fixtures

Floor Drain	☑ *Qty: 1*
Notes	*In each kitchen provide a two-compartment stainless steel sink complete with faucet ledge. Provide a separate single compartment stainless steel hand washing sink, complete with faucet ledge.*

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

Duplex Min. Qty

As per Appendix 1E - 4.2.14.1

Power provision as per Appendix 1E - 4.2.14.1 (9)/ (10)

Lighting

Luminaire Type

LED ☑ *As per Appendix 1E - 4.2.14. 3 (2) (c) 540 lux min*

Lighting Control

Remarks *As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Other Doors *Other* ☑ *Half-height millwork gate*

Department: **15 - Childcare 01 - Infant**

Minimum Area: **7.50** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

To be accessed from the activity room: a walk in closet with adjustable shelves on either side with central circulation is preferred but not required.

Design Features

A closet will be provided to store emergency supplies including a 3-day supply of food and water. The emergency supply closet can be incorporated in one of the program storage spaces.

Size requirements:

Food/water: 0.6 metres D x 0.6 metres H x 1.1 metres H

Equipment bag: 2 @ 0.6 metres x 0.8 metres x 0.6 metres

Additional Remarks

Adjustable shelves will be mechanically fastened to support bracket. All storage will be designed to address seismic safety concerns by ensuring that all furnishings greater than 1.2 metres high, heavy cupboards and other furniture items are fixed to the wall.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*In case of having no ceiling in the storage room, all exposed structure and services will be painted (refer to paint section at 4.2.9.2).*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

For Interior Storage Rooms Shelving:

- All open shelving to be mechanically fastened.
- Adjustable shelving, heavy duty, wood
- 4 rows of shelves, each shelf 0.45 metres deep
- Lowest shelf - 0.76 metres from ground
- 0.40 metres gap between rows

For Infant Program Stroller Storage Shelving:

- Adjustable shelving, heavy duty, wood – wood two row of shelves
- 2 rows of shelves, each shelf 0.45 metres deep
- Lowest shelf - 1.00 metres high from ground
- 0.40 gap between rows

HVAC Requirements

HVAC

Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1* As per Appendix 1E - 4.2.14.1

Lighting

Luminaire Type

LED	☑

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3 As per Appendix 1E - 4.2.14.4 (6) (7) - occupancy sensors required*

Room Design - Door & Window Requirements

Doorsets

Remarks *Wood door-Kick plates are required on the push side , minimum 0.30 metres high. - doors to have locks with 'storeroom' function. -Painted doors and door frames to be G5 'Gloss Level' (semi-gloss).*

Department: **15 - Childcare 01 - Infant**

Minimum Area: **7.50** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Design Features

The dimensions for children's reach to faucets for Infant:

- Distance from front of counter to the tap/paddle = 406 millimetres (the paddle stop approx. 1/16 turn forward on the toddler one)
- Distance from edge of sink to front edge of counter = 70 millimetres
- Distance from edge of soap dispenser to edge of counter = 152 millimetres

Additional Remarks

A dedicated diaper changing area will be provided (refer to subsection 4.3.10 for change table drawing). It will be located near and have visual access to the main activity area and be close to the laundry. It will be separated from activity areas to protect children from potential harm.

When designing the diaper changing area, keep in mind that children cannot be left unattended for even a moment. Everything the caregiver might need to complete the change must be within reach.

Provide space for children's personal storage (baskets with personal effects for each child in) in washroom.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

- Magnetic White Board: Minimum 0.91 metres W x 0.91 metres H to 1.52 W x 0.91 metres H. The larger the size that can be accommodated, the better.

-Above counter mirrors- in case of using full-height mirrors, or at mirrors adjacent to change tables, use shatter-proof acrylic rather than glass.

Millwork - refer to Section 4.3.8 for CAD drawings and dimensions:

- Vanities - All counters with sinks will have minimum 100 millimetres backsplashes and sidesplashes. Counters will be maximum 0.457 metres high.

- Upper open shelving for baskets of children's personal needs – diapers, cream, toothbrushes etc.

- Change table with sink - refer to Section 4.3.10 for CAD drawings and dimensions. Include a built-in ledge to prevent children from rolling off of the change table.

- Moveable steps for larger children (1 per washroom) - store under counter at or near change table - refer to Section 4.3.11 for CAD drawings and dimensions.

- Half-height millwork gate. Minimum 25 millimetres clearance under door. Full length piano hinge is required. Swing doors or gates to have a hold open device such as a hook and eye, an "elephant's foot" stop. or similar.

Washroom Accessories:

- No partition is required.

- Paper towel dispensers to accommodate single-fold towels with no saw tooth cutting bar - Provide 1 in the vicinity of change table sink - Provide 1 at child height at the Infant washroom.

- Provide a waste receptacle in each washroom: recessed receptacles preferred.

- Soap dispensers: Provide one lavatory-mounted soap dispenser at each children sink. - wall-mounted at change table sink.

- Toilet paper dispensers - Provide one adjacent to each toilet in children's washrooms at child height.

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑
Notes	☑ *Hot water to be temperature adjustable 38-40 degrees Celsius (max 49 degrees Celsius)*

Sink Types

Lavatory	☑ *Qty: 3*
Other	☑ *2 children sink and 1 adult sink at diaper change table to be provided , in total 3 sinks. for diaper change area provide a single compartment stainless steel sink complete with a faucet ledge, minimum 300 millimetres deep, with swing tap (gooseneck preferred) and hand spray attachment.*

Fixtures

WC	☑ *Qty: 2 (254 millimetres high)*
Floor Drain	☑ *Qty: 1*
Notes	*Each plumbing fixture to have own shut-off valve. All children's toilets to be tank style with round bowls and closed front toilet seats. Numbers of fixtures at children's washrooms to meet the CCFL regulation of one toilet and one hand basin for every ten children- Infant group : 2 toilet and 2 hand basin o At infant washroom provide per Group minimum: - two 254 millimetres high toilet, sealed to the floor, complete with closed front toilet seat. - two child-accessible hand basin with lever faucets (refer to 4.3.4 Drawings).*

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1*

GFCI receptacles will be tamper resistant and childproof as per Appendix 1E - 4.2.14.1 (1)/(2)

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (c) 540 lux min; glare shielding for diaper change areas*

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Other Doors *Other* ☑ *half-height millwork gate*

Department: **15 - Childcare 01 - Infant**

Minimum Area: **6.00** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions

A small separate room will be provided for parents as a resource room for reading, staff/parent conferences, or breast feeding. One parent room may be shared by two or more Groups.

Critical Adjacencies

It will be private from the program areas and separate from the staff office.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Carpet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Notice board:

Cork Boards with Trim: 0.91 metres W x 0.61 metres H

Millwork:

Counter top with cabinets in parent room with display area and shelving above for educational materials - refer to Section 4.3.2 - Parent room display for CAD drawings and dimensions.

- All furnishings greater than 1.2 metres high require seismic restraints (ie. to be fixed to the wall.)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*
Remarks	*Individual room temperature control*

Electrical Requirements

Power

Duplex Min. Qty	*3* As per Appendix 1E - 4.2.14.1
Other Duplex Min. Qty	*1* Above counter, adjacent to telephone outlet. To be coordinated with parent room display.

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 2*
Data	☑ *CAT6 Drop Min Qty: 5*
Remarks	*Two (2) CAT6 drops at counter for IP phone (coordinate with millwork). Two (2) CAT3 drops at counter for analog phone (coordinate with millwork). One (1) CAT6 drop at 1.2m location to be coordinated with the City of Vancouver. RG6 cable outlet.*

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (a) 320 lux min.*

Lighting Control

Dimmer	☑ *As per Appendix 1E - 4.2.14.4 (3)*
Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Remarks *Wood door-Kick plates are required on the push side , minimum 0.30 metres high. - doors to have locks with 'classroom' function. -Painted doors and door frames to be G5 'Gloss Level' (semi-gloss).*

Windows

Internal Glazing *Y/N* ☑ *Type Provide a one-way mirror for parents to be able to see children (the mirror will be transparent when looking from the parents room and reflective on the other side)*

Window Covering Notes - *All blinds to be commercial grade; chain operated roller style preferred. - Blinds to be installed at interior windows and glazed doors. Ensure blinds on doors are secured on the bottom with a child safe device. - All cords or chains to terminate 1.5 metres above the floor, or to be supported on a hook at that height.*

Department: **15 - Childcare 01 - Infant**

Minimum Area: **4.50** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions

This washroom will be large enough to permit assisted toileting and special physical care of handicapped children. One staff washroom may be shared by two or more Groups.

Additional Remarks

One Accessible shower for staff and disabled children is required in one of the staff washrooms or in the shared staff washroom.

It is preferred but not required to arrange the layout of shared staff facilities to create a clustered staff area comprised of a staff office, staff room and a staff washroom (with shower for end-of-trip facilities).

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

- Provide Mirrors - at mirrors adjacent to change tables, use shatter-proof acrylic rather than glass.

- Provide a change table in the adult washroom. If this is not millwork, it may be a prefabricated item.

Acceptable product: Koala Kare surface mounted change station that supports static loads up to 200 lbs complete with child protection straps - Or pre-approved alternate.

- All counters with sinks will have minimum 100 millimetres backsplashes and sidesplashes.

Washroom Accessories:

- Paper towel dispensers to accommodate single-fold towels with no saw tooth cutting bar - Provide 1 in the vicinity of each change table sink- provide one in each adult washroom.

- Provide a waste receptacle in each washroom: recessed receptacles preferred.

- Soap dispensers: Provide one wall-mounted soap dispenser at each sink.

- Toilet paper dispensers - Provide one adjacent to each toilet in adult washrooms.

- Provide grab bars for accessibility.

- Provide seat for accessible shower.

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑
Notes	☑ *Hot water to be temperature adjustable 38-40 degrees Celsius (max 49 degrees Celsius)*

Sink Types

Lavatory	☑ *Qty: 1*

Fixtures

Barrier Free WC	☑ *Qty: 1*
Floor Drain	☑ *Qty: 1*
Other	☑ *Wheelchair accessible shower - for staff and care of disabled children.*
Notes	*1 handicapped accessible WC 1 Hand basin Provide low-flow, gravity standard, and dual flush. Toilets to meet a Maximum Performance (MaP) Test of 500g or better.*

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1* GFCI receptacles will be tamper resistant and childproof in accordance with Appendix 1E - 4.2.14.1 (1)/(2)

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (c) 540 lux min*

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3 Occupancy sensors as per Appendix 1E - 4.2.14.4 (7)/ 4.2.14.4 (1)*

Room Design - Door & Window Requirements

Doorsets

Remarks *Wood door-Kick plates are required on the push side , minimum 0.30 metres high. - doors to have locks with 'privacy' function. -Painted doors and door frames to be G5 'Gloss Level' (semi-gloss).*

Department: **15 - Childcare 01 - Infant**

Minimum Area: **7.00** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions

A single staff office may be shared by two or more Groups if it is easily accessible to each Group and within hearing range in case of emergency.

Critical Adjacencies

The offices will be accessible to each Group and be within hearing range of the primary activity area(s).

Design Features
Provide space for lockable filing cabinets.

Additional Remarks

It is preferred but not required to arrange the layout of shared staff facilities to create a clustered staff area comprised of a staff office, staff room and a staff washroom (with shower for end-of-trip facilities).

Room Finishes

Floor Finishes

Flooring Characteristics	*- Carpet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Notice board:

Cork Boards with Trim: 0.91 metres W x 0.61 metres H

Millwork:

Counter tops in staff offices with shelving above for workstations (if not provided as furniture) - refer to Section 4.3.13 - Staff Office for CAD drawings and dimensions.

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

Duplex Min. Qty	*3* As per Appendix 1E - 4.2.14.1 and 4.2.14.1 (9)

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 2*
Data	☑ *CAT6 Drop Min Qty: 4*
Remarks	*Two (2) CAT6 drops at counter for IP phone (coordinate with millwork). Two (2) CAT3 drops at counter for analog phones (coordinate with millwork). RG6 cable outlet.*

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (c) 540 lux min*

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Remarks *Wood door-Kick plates are required on the push side , minimum 0.30 metres high. - doors to have locks with 'Privacy' function. -Painted doors and door frames to be G5 'Gloss Level' (semi-gloss).*

Department:	**15 - Childcare 01 - Infant**		
Minimum Area:	**4.00**	*Ceiling Height:* **2440.00**	

Room Design Requirements

General Design Requirements

Activities and Functions

A lockable laundry area and janitorial room will be provided which is not required to be accessible. One laundry/janitorial area may be shared by two or more Groups.

It is preferred but not required to have two separate rooms for laundry and janitorial.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*In case of having no ceiling in the storage room, all exposed structure and services will be painted (refer to paint section at 4.2.9.2).*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Millwork:

Laundry counter - refer to Section 4.3.12 - Laundry Counter for CAD drawings and dimensions.

- Provide backsplash min 0.6 metres high or to underside of cabinets above.

Any base cabinets in the laundry room will be lockable.

Laundry room with:

- Sink

- Adjustable storage shelves

- Paper towel dispensers to accommodate single-fold towels with no saw tooth cutting bar - Provide 1 at each sink.

- Soap dispensers: Provide one wall-mounted soap dispenser at each sink.

janitor room with:

- Floor sink- Provide backsplash on all sides min 0.6 metres high.

- Provide floor sink accessories:

  - service faucet.
  - hose + hose holder
  - mop hanger
  - wall/bumper guards

- Space for storing bucket, mops, brooms, vacuum, ladder, supplies for cleaning

- Adjustable shelves for paper products, light bulbs, etc.

Equipment:

Laundry room serving two or more program Groups:

2 Commercial washing machine - Specify a front-loading machine for water conservation. Maytag model #MHN30PR Commercial High-efficiency Front-load washer or approved equivalent.
2 Commercial dryer. Maytag model #MDE/MDG25PR Commercial Super Capacity Dryer or approved equivalent.
Side-by-side machines are required.

Laundry room serving one program Group:

1 Commercial washing machine - Specify a front-loading machine for water conservation. Maytag model #MHN30PR Commercial High-efficiency Front-load washer or approved equivalent.
1 Commercial dryer. Maytag model #MDE/MDG25PR Commercial Super Capacity Dryer or approved equivalent.
Side-by-side machines are required.

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Lavatory	☑ *Qty: 1*
Janitorial	☑ *Qty: 1*

Fixtures

Floor Drain	☑ *Qty: 1*
Notes	*Sink is required for each laundry room- refer to 4.3.12 - laundry counter for CAD drawing. Provide a floor-mounted mop sink in each laundry/janitorial room, complete with approved backflow preventer valve.*

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1* As per Appendix 1E - 4.2.14.1
Other Duplex Min. Qty	Receptacle types and quantities to match washer and dryer types and quantities.

Lighting

Luminaire Type

LED	☑

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Remarks *Wood door-Kick plates are required on the push side , minimum 0.30 metres high. - doors to have locks with 'storeroom' function. - If the Laundry/janitorial room is not opening to activity room, door material is not required to be wood.*

Department:	**15 - Childcare 01 - Infant**		
Minimum Area:	**85.00**	*Ceiling Height:*	

Room Design Requirements

General Design Requirements

Activities and Functions
Playground equipment, such as climbers, will be placed at the edge of the play area to maximize the available outdoor open play space.

The outdoor play space will include a covered area and an uncovered area to accommodate the various outdoor activities. Between 1/3 and 1/2 of the outdoor area will be clear space for group activities and physical movement.

Since open areas can be taken over by riding toys unless other opportunities are provided, a paved path or route for wheeled toys will wind around other activity areas.

Children will be free to move from activity to activity outdoors as they are indoors without disrupting activities in activity zones.

Critical Adjacencies
The outdoor space will be acoustically buffered from traffic and parking and other disruptive noises, fumes and odours. Particular attention will be given to the building's mechanical equipment and vents. Locate the Childcare outdoor space to reduce noise from children disturbing adjacent uses.

Covered play area is a transition zone from the indoors to the outside and will be located adjacent to the entry. This zone is intended for quiet or concentrated activities such as painting/art, clay/water table, outdoor meals and for active play on rainy days. It is also used for napping in Infant programs.

Design Features
Covered Outdoor 22NSM

Open Outdoor 63NSM

The covered play area will be covered with glazed canopy- provide tempered laminated glazing.

The outdoor play area is to be divided into play zones, For information about play zones refer to Appendix 1E- Childcare Centre Requirements section 2.3.2-Activity Zones.

Provide one grassed area for Infants. Grass will not be used in areas other than Infant play areas. It cannot sustain the traffic in programs with older children unless the outdoor area is well over the minimum allowable area.

Room Finishes

Floor Finishes

Flooring Characteristics	*Do not use dark colours for impervious and play surfaces to reduce heat island effects and protect children from hot surfaces. Very light and reflective materials are not acceptable as they cause glare problems. All play and walking surfaces will be non-slip. Although natural plantings are preferred, artificial turf may be used for small areas of roof-top play areas providing that sand (rather than rubber chips) is used as the medium to hold it in place and that the turf specified is to the satisfaction of Community Care Facilities Licensing (CCFL). All safety information regarding the product is to be submitted to CCFL for their review. Playground fall protection surfaces: Acceptable products must meet CCFL requirements and include: - Engineered wood chip system complete with drainage, for example Fibar System 300. - Poured-in-place rubber system. - Or other pre-approved alternate.*

Ceiling Finishes

Ceiling Characteristics	*The covered play area will be covered with glazed canopy- provide tempered laminated glazing.*

Equipment and Accessories

Furniture, Fixtures and Equipment

Fences:

Minimum heights (all heights to be measured above any climbable permanent fixture located within 1.22 metres of the fence such as planters, benches, play equipment:

- 1.22 metres minimum typically.
- 1.82 metres where the grade outside the fence drops by at least 0.6 metres or a down slope of greater than 45°.
- 2.44 metres where the grade outside the fence drops by at least 3.05 metres, for example at a roof top. 1.82 metres with an extra 0.6 metres sloping 45°inwards is also acceptable.
- 1.82 metres at any pool, pond or body of water.

- Exterior glazed perimeter fencing will require visual markers to mitigate birds from colliding with glazing per City of Vancouver Bird Friendly Design Guidelines, as per Schedule 1- 6.7.1.1 (4).

For all the playground equipment requirements refer to Appendix 1E- Childcare Centre Requirements section 4.2.4.4 - Playground equipment requirements, 4.2.4.3 - Fall protection clearance requirements and depths guidelines

For all the playground leak detection system requirements refer to Appendix 1E- Childcare Centre Requirements section 4.2.6.2 - Roofs.

- Sand depth of sandboxes : minimum 0.305 metres in Infant outdoor play area

-Provide a covered weather-proof video/audio answer station which will have a keyed lock box.

-Provide removable solar shades for a portion of the outdoor play area, specifically over play elements such as the sandbox.

Plumbing Requirements

Water supply		Fixtures	
Cold Water (potable)	☑	Other	☑ *All drains to have removable and cleanable sediment traps. for requirement regarding sediment traps refer to Appendix 1E - 4.2.13.3 (1) and 4.2.13.3 (2). Hose bibs to be provided: Two in each outdoor play area, one at the building, one near sand box or children's urban agriculture plots. for requirements regarding hose bibs refer to Appendix 1E - 4.2.13.3 (5).*

Electrical Requirements

Power

General Power	For electrical requirements regarding access control refer to Appendix 1E - 4.2.16.2 (7). For requirements regarding local alarm and RTE buttons see Appendix 1E - 4.2.8.4 (9) and 4.2.8.4 (10).
Duplex Min. Qty	As per Appendix 1E - 4.2.14.1 (4) provide GFCI receptacles

Lighting

Luminaire Type

LED	☑

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3 (8)- illuminate entries, exits, high activity areas and security As per Appendix 1E - 4.2.14.3 (9) - HOA controls for servicing*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Doors to be fully glazed with tempered glass. - Swing doors or gates to have a hold open device such as a hook and eye, an “elephant’s foot” stop. or similar. -Sliding doors to play areas to have the ability to pin in place at open position to avoid injury from unsupervised sliding. -Kick plates are required on the push side of all doors with closers - kick plates minimum 0.30 metres high. - doors to have locks with 'classroom' function. - At all entrances from the outdoors provide walk-off mats (minimum size will allow for an adult to take two steps before stepping onto another flooring surface). - Deadbolt locks will be provided on both sides of low gates to exterior. Low gates between play areas, provide ball handsets only. - For requirements for Hardware and security, refer to Appendix 1E-Childcare Centre Requirements sections 4.2.8.4 - Hardware and 4.2.16.2 -Access Control, 4.2.16.3 - Intrusion Alarm and 4.2.16.4 - Enterphones .*

Department: **15 - Childcare 01 - Infant**

Minimum Area: **2.80** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies
It will be adjacent to outdoor space of Infant Group.

Equipment and Accessories

Furniture, Fixtures and Equipment

Exterior Playground Storage Shelving:

- Adjustable shelving, heavy duty, wire racks
- 4 rows of shelves, each shelf 0.45 metres- 0.50 metres deep
- Lowest shelf - 0.76 metres from ground
- 0.50 metres gap between rows

Electrical Requirements

Power

Duplex Min. Qty	*1* As per Appendix 1E - 4.2.14.1 (4) provide GFCI receptacles

Lighting

Luminaire Type

LED	☑

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3 (8)- illuminate entries, exits, high activity areas and security As per Appendix 1E - 4.2.14.3 (9) - HOA controls for servicing As per Appendix 1E - 4.2.14.4 (6) (7) - occupancy sensors required*

Room Design - Door & Window Requirements

Doorsets

Remarks *-Kick plates are required at all storage room doors. Kick plates must be minimum 0.30 metres high. - doors to have locks with 'classroom' or 'storeroom' function. - Swing doors or gates to have a hold open device such as a hook and eye, an “elephant’s foot” stop. or similar. -Flush bolts at top + bottom on inactive leaf are required.*

Department:	**15 - Childcare 02 - Toddler**		
Minimum Area:	**40.50**	*Ceiling Height:* **2440.00**	

Room Design Requirements

General Design Requirements

Activities and Functions

The activity room will be the largest of the program spaces. It will include a mixture of open spaces and smaller alcove-type spaces and be designed to accommodate a variety of activity settings. The design will emphasize flexibility by utilizing movable elements to define spaces.

Critical Adjacencies

Adjacent to outdoor covered area, with a view to outdoor play spaces.

Zone the activity settings such that noisy and quiet, intense and calm and messy (or wet) and tidy activities are separated. These zones will be shown on submitted plans.

The messy/wet zone will be used for art activities and eating and will be located adjacent to the kitchen and to the outdoor play area so that on sunny days, doors can be open and activities can flow between indoor and outdoor areas. There will be enough space for art/eating tables, easels, water and texture tables, and storage. Enough space is required to seat all children at once for snacks and meals.

Design Features

Large settings such as dramatic play and large blocks, will be represented in planning by a 3.0 metres diameter circle. Small settings for intense activities such as puzzles will be represented by a 2.0 metres diameter circle (size varies by age group and activity). Movement activities require a dedicated area which will include convenient storage for wheeled toys, large blocks, musical instruments, and climbing equipment.

An irregular square with alcoves and nooks is a suitable shape for the room. Avoid long narrow rooms. The plan will direct children from one activity to the next and delineate, protect and support activities in each setting.

Circulation within an activity room will be clear and straightforward, but not overly simplified and uninteresting. The optimum circulation path is highly visible and snakes through space, overlooking each activity. "Shopping" among activities is itself an activity. Circulation paths will respect the boundaries of activity areas by meandering around but not passing through activity settings. Allow space for children engaged in activities to play uninterrupted by others passing by them.

Room Finishes

Floor Finishes	
Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*
Ceiling Finishes	
Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*
Wall Finishes	
Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Wall Protection	
Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

- Notice boards or other strategy is required for the display of children's projects.

Millwork:

- Staff Counter - refer to Section 4.3.3 for CAD drawings and dimensions.

- Art counter with sink: min. 1.8 metres long in Toddler Activity Room - refer to Section 4.3.6 for CAD drawings and dimensions. - Provide backsplash min 0.6 metres high or to underside of cabinets above.

Accessories:

- Paper towel dispensers to accommodate single-fold towels with no saw tooth cutting bar - Provide 1 at each art sink.

- Soap dispensers: Provide one wall-mounted soap dispenser at each sink.

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑
Notes	☑ *Hot water to be temperature adjustable 38-40 degrees Celsius (max 49 degrees Celsius)*

Fixtures

Other	☑

Sink Types

Other	☑ *Art sink: to be stainless steel complete with a faucet ledge. 0.30 metres deep sink. Gooseneck faucet with handspray. Provide a floor mounted Zurn sediment trap at (Z1180 Solids Interceptor) all art sinks.*

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*
Remarks	*Individual room temperature control. CO2 monitoring through BMS.*

Electrical Requirements

Power

General Power	For electrical requirements regarding access control refer to Appendix 1E - 4.2.16.2 (7). For requirements regarding local alarm and RTE buttons see Appendix 1E - 4.2.8.4 (9) and 4.2.8.4 (10).
Duplex Min. Qty	*6* As per Appendix 1E - 4.2.14.1
Other Duplex Min. Qty	*1* Above counter, adjacent to telephone outlet. To be coordinated with staff counter.

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 2*
Data	☑ *CAT6 Drop Min Qty: 4*
Remarks	*Two (2) CAT6 drops at staff counter for IP phones (coordinate with millwork). Two (2) CAT3 drops at staff counter for analog phones (coordinate with millwork). RG6 cable outlet*

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (b) 420 lux min*

Lighting Control

Multi-Level	☑ *As per Appendix 1E - 4.2.14.4 (2)*
Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Doors to be fully glazed with tempered glass. - Swing doors or gates to have a hold open device such as a hook and eye, an “elephant’s foot” stop. or similar. -Kick plates are required on the push side of all doors with closers - kick plates minimum 0.30 metres high. - doors to have locks with 'classroom' function -Painted doors and door frames to be G5 'Gloss Level' (semi-gloss). - At all entrances from the outdoors provide walk-off mats (minimum size will allow for an adult to take two steps before stepping onto another flooring surface). - Blinds required on door glazing (and secured on bottom with child-safe device). - Child-proof thumb-turn deadbolt on all non-emergency exit doors to exterior is required. - flush-bolt at top and bottom for inactive leaf is required. - For requirements for Hardware and security, refer to Appendix 1E-Childcare Centre Requirements sections 4.2.8.4 - Hardware and 4.2.16.2 -Access Control, 4.2.16.3 - Intrusion Alarm and 4.2.16.4 - Enterphones .*

Windows

Exterior Window Required ☑ - *Note, exterior windows in children’s areas will be at a height that children can see out. If at a height accessible to children , it must be screened and restricted to a max opening of 100 millimetres. If opening onto a walkway or play area , slider recommended.*
Window Covering Notes - *Blinds to be installed on all exterior windows. - All blinds to be commercial grade; chain operated roller style preferred. - All cords or chains to terminate 1.5 metres above the floor, or to be supported on a hook at that height.*

Department: **15 - Childcare 02 - Toddler**

Minimum Area: **28.00** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies
The gross motor/nap room will be designed to open to the Activity Room to enable shared use and to enhance flexibility.

The room will be located away from outdoor play areas.

Design Features

Nap room layout, will allow for approximately 0.61 metres between mats or cots.

Additional Remarks
Provide space for children's personal storage (baskets with personal effects for each child in) in gross motor/nap room - near mat storage is best (room no. 15.02.003).

Room Finishes

Floor Finishes

Flooring Characteristics	*- Carpet is required in all nap rooms - Base to be rubber, continuous throughout, and minimum 0.1 metres. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" painting For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Mats Required: Number required equal to licensed capacity plus an extra 20% for part-time children - 12+3=15 mats. (see room no. 15.02.003)

Millwork:

Music shelves - refer to Section 4.3.14 - Music shelf for CAD drawings and dimensions.

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*
Remarks	*Individual room temperature control. CO2 monitoring through BMS.*

Electrical Requirements

Power

Duplex Min. Qty	*4* As per Appendix 1E - 4.2.14.1 (1) Child-proof and shatter-proof faceplates (TYP). As per Appendix 1E - 4.2.14.1 (3) Provide duplex receptacle at music shelf @ 1.327 metres AFF.

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 2*

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (a) 320 lux min*

Lighting Control

Multi-Level	☑ *As per Appendix 1E - 4.2.14.4 (2)*
Dimmer	☑ *As per Appendix 1E - 4.2.14.4 (3)*
Remarks	*As per Appendix 1E - 4.2.14.3. Provide dimmable wall sconces in addition to general lighting Switches located outside the room as per Appendix 1E - 4.2.14.4 (5) No un-switched lights (eg security lighting) as per Appendix 1E - 4.2.14.4 (4)*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Doors to be fully glazed with tempered glass. - Darkening blinds to be installed on nap room windows and on door glazing. Ensure blinds on doors are secured on the bottom with a child safe device. - Swing doors or gates to have a hold open device such as a hook and eye, an "elephant's foot" stop. or similar. -Kick plates are required on the push side of all doors with closers - kick plates minimum 0.30 metres high. - doors to have locks with 'passage' function -Flush bolts on inactive leaf are required.*

Windows

Window Covering Notes - *Darkening blinds to be installed on nap room windows and on door glazing. - All cords or chains to terminate 1.5 metres above the floor, or to be supported on a hook at that height.*

Department: **15 - Childcare 02 - Toddler**

Minimum Area: **4.50** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies
It will be adjacent to the gross motor/nap room.

Design Features

Mats must be stored in such a way that they do not touch each other

Additional Remarks

All storage will be designed to address seismic safety concerns by ensuring that tall, heavy cupboards and other furniture items are fixed to the wall.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*In case of having no ceiling in the storage room, all exposed structure and services will be painted (refer to paint section at 4.2.9.2).*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Millwork required - refer to Section 4.3.15 - Sleep Mat Storage for CAD drawings and dimensions.

- Provide sleep mat storage for 15 mats, per 15.02.002-equipment and accessories.

HVAC Requirements

HVAC

Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1* As per Appendix 1E - 4.2.14.1

Lighting

Luminaire Type

LED	☑

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3 As per Appendix 1E - 4.2.14.4 (6) (7) - occupancy sensors required*

Room Design - Door & Window Requirements

Doorsets

Remarks *Wood door-Kick plates are required on the push side , minimum 0.30 metres high. - doors to have locks with 'storeroom' function. -If sliding doors are used, they will have the ability to pin in place at open position.*

Department:	**15 - Childcare 02 - Toddler**
Minimum Area:	**9.00**
Ceiling Height:	**2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions

The Quiet Room will be a separate room with a door, which can be used for quiet activities involving one staff and up to 3 children. There will be enough space for a small table, chairs and some storage.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Carpet is required in all quiet rooms. - Base to be rubber, continuous throughout, and minimum 0.1 metres. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Millwork:

Music shelves optional - refer to Section 4.3.14 - Music shelf for CAD drawings and dimensions.

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*
Remarks	*Individual room temperature control.*

Electrical Requirements

Power

Duplex Min. Qty	*3* As per Appendix 1E - 4.2.14.1

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (a) 320 lux min*

Lighting Control

Multi-Level	☑ *As per Appendix 1E - 4.2.14.4 (2)*
Dimmer	☑ *As per Appendix 1E - 4.2.14.4 (3)*
Remarks	*As per Appendix 1E - 4.2.14.3. Provide dimmable wall sconces in addition to general lighting. Switches located outside the room as per Appendix 1E - 4.2.14.4 (5) No un-switched lights (eg security lighting) as per Appendix 1E - 4.2.14.4 (4)*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Doors to be fully glazed with tempered glass. - Swing doors or gates to have a hold open device such as a hook and eye, an “elephant’s foot” stop. or similar. -Kick plates are required on the push side of all doors with closers - kick plates minimum 0.30 metres high. - doors to have locks with 'passage' function*

Windows

Window Covering Notes - *All blinds to be commercial grade; chain operated roller style preferred. - Blinds to be installed at interior windows and glazed doors. Ensure blinds on doors are secured on the bottom with a child safe device. - All cords or chains to terminate 1.5 metres above the floor, or to be supported on a hook at that height.*

Department:	**15 - Childcare 02 - Toddler**		
Minimum Area:	**12.00**	*Ceiling Height:* **2440.00**	

Room Design Requirements

General Design Requirements

Activities and Functions
A separate cubby area will be provided for each Group.

Critical Adjacencies
This area will be directly accessible to the washroom and to the outdoor covered play area. And it will open up to the main activity area.

The cubby area is best located immediately inside the entry used by children when using the outdoor play yard. This arrangement ensures that wet and muddy outer clothes and boots are not brought into the activity areas of the childcare.

Design Features
There will be open floor space for a group of eight children and one staff to get dressed for winter conditions separated from the activities of the other children.

At all entrances from the outdoors provide walk-off mats (minimum size will allow for an adult to take two steps before stepping onto another flooring surface). A child- safe recessed grille is preferred, surface walk-off mats are also acceptable.

Additional Remarks

Parents of Toddlers will enter through the cubby area so that shoes can be removed before entering areas where children are playing on the floor.

Provide space for children's personal storage (baskets with personal effects for each child in) in cubbies.

Storage for the program strollers can be separate from other program storage. Provide 2 spaces for program 3-position strollers. near Infant/Toddler cubbies is best:

The size of the strollers are 1.9 metres long by 0.6 metres wide by 1.0 metres high. Ensure circulation space from entrance to stroller storage accommodates the turning radius of the stroller.

Room Finishes

Floor Finishes	
Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*
Ceiling Finishes	
Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*
Wall Finishes	
Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Wall Protection	
Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Notice boards:

- Program Entry to have at least two Cork Boards - Minimum 0.91 metres W x 0.61 metres H to 1.5 metres W x 0.91 H. The larger the size that can be accommodated, the better.

- Also provide cork board above Parent's sign-in desk, coordinate with millwork.

Millwork:

- Parent sign-in desk - refer to Section 4.3.1 for CAD drawings and dimensions.

- Children's cubbies (number required equal to the licensed capacity plus an extra 20% for part-time children). 12 + 3 = 15 cubbies - refer to Section 4.3.4 for CAD drawings and dimensions.

- Hooks / space for staff coats and shoes: 4 per program Group. These need to be at or near cubbies.
- Half-height millwork gate. Minimum 25 millimetres clearance under door. Full length piano hinge is required. Swing doors or gates to have a hold open device such as a hook and eye, an "elephant's foot" stop. or similar.

HVAC Requirements

HVAC

Minimum Temp (C)	*21*

Electrical Requirements

Power

General Power	For electrical requirements regarding access control refer to Appendix 1E - 4.2.16.2 (7) and 4.2.16.2 (8). For requirements regarding local alarm and RTE buttons see Appendix 1E - 4.2.8.4 (10).
Other Duplex Min. Qty	*1* Above counter, adjacent to telephone outlet. To be coordinated with parent's sign-in desk.

Lighting

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Doors to be fully glazed with tempered glass. - Swing doors or gates to have a hold open device such as a hook and eye, an "elephant's foot" stop. or similar. -Kick plates are required on the push side of all doors with closers - kick plates minimum 0.30 metres high. - doors to have locks with 'classroom' function. - At all entrances from the outdoors provide walk-off mats (minimum size will allow for an adult to take two steps before stepping onto another flooring surface). - For requirements for Hardware and security, refer to Appendix 1E-Childcare Centre Requirements sections 4.2.8.4 - Hardware and 4.2.16.2 -Access Control, 4.2.16.3 - Intrusion Alarm and 4.2.16.4 - Enterphones .*
Other Doors *Other ☑ half-height millwork gate*

Department:	**15 - Childcare 02 - Toddler**
Minimum Area:	**9.50**
Ceiling Height:	**2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions

Two Groups can share one kitchen if it is readily accessible by both Groups. If kitchen is shared by two (2) Groups the total kitchen area will be at least 12 SM.

An open kitchenette (along a wall) is not permissible.

Critical Adjacencies

Kitchen will be directly accessible from main activity area.

Design Features

Kitchens may be located in an alcove within the primary activity space but separated from the Activity Room by a child-height counter. This permits children to be included in the kitchen activities without bringing them into the kitchen itself with its safety concerns. It also allows staff to supervise activities in the Activity Room while in the kitchen.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. - Ceiling finishes in kitchen must be washable. For general requirements for ceiling finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Magnetic White Board: Minimum 0.91 metres W x 0.91 metres H to 1.5 metres W x 0.91 metres H. The larger the size that can be accommodated, the better.

Millwork:

Kitchen - refer to Section 4.3.7 for CAD drawings and dimensions. - Provide backsplash min 0.6 metres high or to underside of cabinets above.

- Half-height millwork gate. Minimum 25 millimetres clearance under door. Full length piano hinge is required. Swing doors or gates to have a hold open device such as a hook and eye, an “elephant’s foot” stop. or similar.

Accessories

- Paper towel dispensers to accommodate single-fold towels with no saw tooth cutting bar - Provide 1 at each sink in kitchens.

- Soap dispensers: Provide one wall-mounted soap dispenser at each sink.

Equipment:

For general requirements for equipment refer to Appendix 1E -Childcare Centre Requirements section 4.2.11 - Equipment

In case of sharing the kitchen with Infant Group:

- Commercial style dishwasher with a sani-cycle, 70 degrees Fahrenheit heat booster, and back-flow preventer valve. Note that these dishwashers require deeper than standard millwork: millwork to be designed to suit. Moyer Diebel model #501HT with 70 degree F rise booster or approved equivalent.

- Stove with oven: 0.76 metres wide, with 4 burners; placement of controls to be suitable for child safety, for example at back; self-cleaning convection oven. (separate wall oven and range top are also acceptable). Whirlpool model #YWFE710HOBW or approved equivalent.

- Range hood to mechanically exhaust stove to the outside; exhaust rate (CFM) to be determined by HVAC engineer. GE model #JV635NWWC or approved equivalent.

- Microwave oven: 2.0 cubic feet, 1100 watt, minimum. Panasonic model #NNSN968W or approved equivalent.

- Each Program will require its own full-sized fridge in the kitchen(w/ Freezer)- 18.5 cubic feet, 0.76 metres W, and one upright freezer for each kitchen (20.1 cu ft) - this is shared between two programs, and can be in a storage room). Refrigerator to be Whirlpool model #EB9FVHXWQ or approved equivalent. Upright Freezer to be Whirlpool model #EV200NZTQ or approved equivalent.

In case of having a dedicated kitchen:

- All equipment same as above except:

One full-size fridge (w/freezer) required - 21.5 cubic feet, frost free, 0.76 metres W - No separate freezer required.

Plumbing Requirements

Sink Types

Handwash	☑ *Qty: 1*
Double	☑

Fixtures

Floor Drain	☑ *Qty: 1*
Notes	*In each kitchen provide a two-compartment stainless steel sink complete with faucet ledge. Provide a separate single compartment stainless steel hand washing sink, complete with faucet ledge.*

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

Duplex Min. Qty

As per Appendix 1E - 4.2.14.1

Power provision as per Appendix 1E - 4.2.14.1 (9)/ (10)

Lighting

Luminaire Type

LED ☑ *As per Appendix 1E - 4.2.14. 3 (2) (c) 540 lux min*

Lighting Control

Remarks *As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Other Doors *Other* ☑ *half-height millwork gate*

Department:	**15 - Childcare 02 - Toddler**		
Minimum Area:	**7.00**	*Ceiling Height:* **2440.00**	

Room Design Requirements

General Design Requirements

Critical Adjacencies

To be accessed from the activity room. A walk in closet with adjustable shelves on either side with central circulation is preferred but not required.

Design Features

A closet will be provided to store emergency supplies including a 3-day supply of food and water. The emergency supply closet can be incorporated in one of the program storage spaces.

Size requirements:

Food/water: 0.6 metres D x 0.6 metres H x 1.1 metres H

Equipment bag: 2 @ 0.6 metres x 0.8 metres x 0.6 metres

Additional Remarks

Adjustable shelves will be mechanically fastened to support bracket. All storage will be designed to address seismic safety concerns by ensuring that all furnishings greater than 1.2 metres high, heavy cupboards and other furniture items are fixed to the wall.

Room Finishes

Floor Finishes	
Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*
Ceiling Finishes	
Ceiling Characteristics	*In case of having no ceiling in the storage room, all exposed structure and services will be painted (refer to paint section at 4.2.9.2).*
Wall Finishes	
Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Wall Protection	
Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

For Interior Storage Rooms Shelving:

- All open shelving to be mechanically fastened.
- Adjustable shelving, heavy duty, wood
- 4 rows of shelves, each shelf 0.45 metres deep
- Lowest shelf - 0.76 metres from ground
- 0.40 metres gap between rows

For Toddler Program Stroller Storage Shelving:

- Adjustable shelving, heavy duty, wood – wood two row of shelves
- 2 rows of shelves, each shelf 0.45 metres deep
- Lowest shelf - 1.00 metres high from ground
- 0.40 metres gap between rows

HVAC Requirements

HVAC

Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1* As per Appendix 1E - 4.2.14.1

Lighting

Luminaire Type

LED	☑

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3 As per Appendix 1E - 4.2.14.4 (6) (7) - occupancy sensors required*

Room Design - Door & Window Requirements

Doorsets

Remarks *Wood door-Kick plates are required on the push side , minimum 0.30 metres high. - doors to have locks with 'storeroom' function. -Painted doors and door frames to be G5 'Gloss Level' (semi-gloss).*

Department: **15 - Childcare 02 - Toddler**

Minimum Area: **8.00** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

Immediately accessible from the cubby and activity areas. Staff will be able to visually supervise the entrance to the washroom from the main activity area.

Design Features

The dimensions for children's reach to faucets for Toddler:

- Distance from front of counter to the tap/paddle = 406 millimetres (the paddle stop approx. 1/16 turn forward on the toddler one)
- Distance from edge of sink to front edge of counter = 70 millimetres
- Distance from edge of soap dispenser to edge of counter = 152 millimetres

Additional Remarks

A dedicated diaper changing area will be provided (refer to subsection 4.3.10 for change table drawing). It will be located near and have visual access to the main activity area and be close to the laundry. It will be separated from activity areas to protect children from potential harm.

When designing the diaper changing area, keep in mind that children cannot be left unattended for even a moment. Everything the caregiver might need to complete the change must be within reach.

Provide space for children's personal storage (baskets with personal effects for each child in) in washroom.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

- Magnetic White Board: Minimum 0.91 metres W x 0.91 metres H to 1.52 metres W x 0.91 metres H. The larger the size that can be accommodated, the better.

-Above counter mirrors - in case of using full-height mirrors, or at mirrors adjacent to change tables, use shatter-proof acrylic rather than glass.

Millwork - refer to Section 4.3.8 for CAD drawings and dimensions:

- Vanities - All counters with sinks will have minimum 100 millimetres backsplashes and sidesplashes. Counters will be maximum 0.457 metres high.

- Upper open shelving for baskets of children's personal needs – diapers, cream, toothbrushes etc.

- Change table with sink - refer to Section 4.3.10 for CAD drawings and dimensions. Include a built-in ledge to prevent children from rolling off of the change table.

- Moveable steps for larger children (1 per washroom) - store under counter at or near change table - refer to Section 4.3.11 for CAD drawings and dimensions.

- Half-height millwork gate. Minimum 25 millimetres clearance under door. Full length piano hinge is required. Swing doors or gates to have a hold open device such as a hook and eye, an "elephant's foot" stop. or similar.

Washroom Accessories:

- At the Toddler washroom: partitions are required, doors are not required.

- Paper towel dispensers to accommodate single-fold towels with no saw tooth cutting bar - Provide 1 in the vicinity of change table sink - Provide 1 at child height at the Toddler washroom.

- Provide a waste receptacle in each washroom: recessed receptacles preferred.

- Soap dispensers: Provide one lavatory-mounted soap dispenser at each children sink. - wall-mounted at change table sink.

- Toilet paper dispensers - Provide one adjacent to each toilet in children's washrooms at child height.

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑
Notes	☑ *Hot water to be temperature adjustable 38-40 degrees Celsius (max 49 degrees Celsius)*

Sink Types

Lavatory	☑ *Qty: 3*
Other	☑ *2 children sink and 1 adult sink at diaper change table to be provided , in total 3 sinks. for diaper change area provide a single compartment stainless steel sink complete with a faucet ledge, minimum 0.30 metres deep, with swing tap (gooseneck preferred) and hand spray attachment.*

Fixtures

WC	☑ *Qty: 2 (254 millimetres high)*
Floor Drain	☑ *Qty: 1*
Notes	*Each plumbing fixture to have own shut-off valve. All children's toilets to be tank style with round bowls and closed front toilet seats. Numbers of fixtures at children's washrooms to meet the CCFL regulation of one toilet and one hand basin for every ten children- toddler group : 2 toilet and 2 hand basin o At toddler washroom provide per Group minimum: - Two toilets, sealed to the floor, complete with closed front toilet seat, 254 millimetres high. - Two child-accessible hand basins with lever faucets (refer to 4.3.8 Drawings).*

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1* GFCI receptacles will be tamper resistant and childproof as per Appendix 1E - 4.2.14.1 (1)/(2)

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (c) 540 lux min; glare shielding for diaper change areas*

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Other Doors *Other* ☑ *half-height millwork gate*

Department: **15 - Childcare 02 - Toddler**

Minimum Area: **6.00** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions

A small separate room will be provided for parents as a resource room for reading, staff/parent conferences, or breast feeding. One parent room may be shared by two or more Groups.

Critical Adjacencies

It will be private from the program areas and separate from the staff office.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Carpet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Notice board:

Cork Boards with Trim: 0.91 metres W x 0.61 metres H

Millwork:

Counter top with cabinets in parent room with display area and shelving above for educational materials - refer to Section 4.3.2 - Parent room display for CAD drawings and dimensions.

- All furnishings greater than 1.2 metres high require seismic restraints (ie. to be fixed to the wall.)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*
Remarks	*Individual room temperature control.*

Electrical Requirements

Power

Duplex Min. Qty	*1* As per Appendix 1E - 4.2.14.1
Other Duplex Min. Qty	*1* Above counter, adjacent to telephone outlet. To be coordinated with parent room display.

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 2*
Data	☑ *CAT6 Drop Min Qty: 5*
Remarks	*Two (2) CAT6 drops at counter for IP phone (coordinate with millwork). Two (2) CAT3 drops at counter for analog phone (coordinate with millwork). One (1) CAT6 drop at 1.2m location to be coordinated with the City of Vancouver. RG6 cable outlet.*

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (a) 320 lux min.*

Lighting Control

Dimmer	☑ *As per Appendix 1E - 4.2.14.4 (3)*
Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Remarks *Wood door-Kick plates are required on the push side , minimum 0.30 metres high. - doors to have locks with 'classroom' function. -Painted doors and door frames to be G5 'Gloss Level' (semi-gloss).*

Windows

Internal Glazing *Y/N* ☑ *Type Provide a one-way mirror for parents to be able to see children (the mirror will be transparent when looking from the parents room and reflective on the other side)*

Window Covering Notes - *All blinds to be commercial grade; chain operated roller style preferred. - Blinds to be installed at interior windows and glazed doors. Ensure blinds on doors are secured on the bottom with a child safe device. - All cords or chains to terminate 1.5 metres above the floor, or to be supported on a hook at that height.*

Department:	**15 - Childcare 02 - Toddler**		
Minimum Area:	**4.50**	*Ceiling Height:* **2440.00**	

Room Design Requirements

General Design Requirements

Activities and Functions

This washroom will be large enough to permit assisted toileting and special physical care of handicapped children. One staff washroom may be shared by two or more Groups.

Additional Remarks

One Accessible shower for staff and disabled children is required in one of the staff washrooms or in the shared staff washroom.

It is preferred but not required to arrange the layout of shared staff facilities to create a clustered staff area comprised of a staff office, staff room and a staff washroom (with shower for end-of-trip facilities).

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

- Provide Mirrors - at mirrors adjacent to change tables, use shatter-proof acrylic rather than glass.

- Provide a change table in the adult washroom. If this is not millwork, it may be a prefabricated item.

Acceptable product: Koala Kare surface mounted change station that supports static loads up to 200 lbs complete with child protection straps - Or pre-approved alternate.

- All counters with sinks will have minimum 100 millimetres backsplashes and sidesplashes.

Washroom Accessories:

- Paper towel dispensers to accommodate single-fold towels with no saw tooth cutting bar - Provide 1 in the vicinity of each change table sink- provide one in each adult washroom.

- Provide a waste receptacle in each washroom: recessed receptacles preferred.

- Soap dispensers: Provide one wall-mounted soap dispenser at each sink.

- Toilet paper dispensers - Provide one adjacent to each toilet in adult washrooms.

- Provide grab bars for accessibility.

- Provide seat for accessible shower.

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑
Notes	☑ *Hot water to be temperature adjustable 38-40 degrees Celsius (max 49 degrees Celsius)*

Sink Types

Lavatory	☑ *Qty: 1*

Fixtures

Barrier Free WC	☑ *Qty: 1*
Floor Drain	☑ *Qty: 1*
Other	☑ *Wheelchair accessible shower - for staff and care of disabled children.*
Notes	*1 handicapped accessible WC 1 Hand basin Provide low-flow, gravity standard, and dual flush. Toilets to meet a Maximum Performance (MaP) Test of 500g or better.*

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1* GFCI receptacles will be tamper resistant and childproof in accordance with Appendix 1E - 4.2.14.1 (1)/(2)

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (c) 540 lux min*

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3 Occupancy sensors as per Appendix 1E - 4.2.14.4 (7)/ 4.2.14.4 (1)*

Room Design - Door & Window Requirements

Doorsets

Remarks *Wood door-Kick plates are required on the push side , minimum 0.30 metres high. - doors to have locks with 'Privacy' function. -Painted doors and door frames to be G5 'Gloss Level' (semi-gloss).*

Department: **15 - Childcare 02 - Toddler**

Minimum Area: **7.00** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions

A single staff office may be shared by two or more Groups if it is easily accessible to each Group and within hearing range in case of emergency.

Critical Adjacencies

The offices will be accessible to each Group and be within hearing range of the primary activity area(s).

Design Features
Provide space for lockable filing cabinets.

Additional Remarks

It is preferred but not required to arrange the layout of shared staff facilities to create a clustered staff area comprised of a staff office, staff room and a staff washroom (with shower for end-of-trip facilities).

Room Finishes

Floor Finishes

Flooring Characteristics	*- Carpet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Notice board:

Cork Boards with Trim: 0.91 metres W x 0.61 metres H

Millwork:

Counter tops in staff offices with shelving above for workstations (if not provided as furniture) - refer to Section 4.3.13 - Staff Office for CAD drawings and dimensions.

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*
Remarks	*Individual room temperature control.*

Electrical Requirements

Power

Duplex Min. Qty	*3* As per Appendix 1E - 4.2.14.1 and 4.2.14.1 (9)

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 2*
Data	☑ *CAT6 Drop Min Qty: 4*
Remarks	*Two (2) CAT6 drops at counter for IP phones (coordinate with millwork). Two (2) CAT3 drops at counter for analog phones (coordinate with millwork). RG6 cable outlet.*

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (c) 540 lux min*

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Remarks *Wood door-Kick plates are required on the push side , minimum 0.30 metres high. - doors to have locks with 'Privacy' function. -Painted doors and door frames to be G5 'Gloss Level' (semi-gloss).*

Department:	**15 - Childcare 02 - Toddler**		
Minimum Area:	**4.00**	*Ceiling Height:* **2440.00**	

Room Design Requirements

General Design Requirements

Activities and Functions

A lockable laundry area and janitorial room will be provided which is not required to be accessible. One laundry/janitorial area may be shared by two or more Groups.

It is preferred but not required to have two separate rooms for laundry and janitorial.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*In case of having no ceiling in the storage room, all exposed structure and services will be painted (refer to paint section at 4.2.9.2).*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Millwork:

Laundry counter - refer to Section 4.3.12 - Laundry Counter for CAD drawings and dimensions.

Any base cabinets in the laundry room will be lockable.

- Provide backsplash min 0.6 metres high or to underside of cabinets above.

Laundry room with:

- Sink

- Adjustable storage shelves

- Paper towel dispensers to accommodate single-fold towels with no saw tooth cutting bar - Provide 1 at each sink.

- Soap dispensers: Provide one wall-mounted soap dispenser at each sink.

janitor room with:

- Floor sink- Provide backsplash on all sides min 0.6 metres high.

- Provide floor sink accessories:

  - service faucet.
  - hose + hose holder
  - mop hanger
  - wall/bumper guards

- Space for storing bucket, mops, brooms, vacuum, ladder, supplies for cleaning

- Adjustable shelves for paper products, light bulbs, etc.

Equipment:

Laundry room serving two or more program Groups:

2 Commercial washing machine - Specify a front-loading machine for water conservation. Maytag model #MHN30PR Commercial High-efficiency Front-load washer or approved equivalent.
2 Commercial dryer. Maytag model #MDE/MDG25PR Commercial Super Capacity Dryer or approved equivalent.
Side-by-side machines are required.

Laundry room serving one program Group:

1 Commercial washing machine - Specify a front-loading machine for water conservation. Maytag model #MHN30PR Commercial High-efficiency Front-load washer or approved equivalent.
1 Commercial dryer. Maytag model #MDE/MDG25PR Commercial Super Capacity Dryer or approved equivalent.
Side-by-side machines are required.

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Lavatory	☑ *Qty: 1*
Janitorial	☑ *Qty: 1*

Fixtures

Floor Drain	☑ *Qty: 1*
Notes	*Sink is required for each laundry room- refer to 4.3.12 - laundry counter for CAD drawing. Provide a floor-mounted mop sink in each laundry/janitorial room, complete with approved backflow preventer valve.*

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1* As per Appendix 1E - 4.2.14.1
Other Duplex Min. Qty	Receptacle types and quantities to match washer and dryer types and quantities.

Lighting

Luminaire Type

LED	☑

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Remarks *Wood door-Kick plates are required on the push side , minimum 0.30 metres high. - doors to have locks with 'storeroom' function. - If the Laundry/janitorial room is not opening to activity room, door material is not required to be wood.*

Department:	**15 - Childcare 02 - Toddler**		
Minimum Area:	**170.00**	*Ceiling Height:*	

Room Design Requirements

General Design Requirements

Activities and Functions
Outdoor play areas will be designed and built to create a natural environment utilizing a variety of textures and natural materials.

Playground equipment, such as climbers, will be placed at the edge of the play area to maximize the available outdoor open play space.

The outdoor play space will include a covered area and an uncovered area to accommodate the various outdoor activities. Between 1/3 and 1/2 of the outdoor area will be clear space for group activities and physical movement.

Since open areas can be taken over by riding toys unless other opportunities are provided, a paved path or route for wheeled toys will wind around other activity areas.

Children will be free to move from activity to activity outdoors as they are indoors without disrupting activities in activity zones.
Critical Adjacencies
The outdoor space will be acoustically buffered from traffic and parking and other disruptive noises, fumes and odours. Particular attention will be given to the building's mechanical equipment and vents. Locate the Childcare outdoor space to reduce noise from children disturbing adjacent uses.

Design Features
Covered Outdoor 33NSM

Open Outdoor 137NSM

The covered play area will be covered with glazed canopy- provide tempered laminated glazing.

The outdoor play area is to be divided into play zones, For information about play zones refer to Appendix 1E- Childcare Centre Requirements section 2.3.2-Activity Zones.

Room Finishes

Floor Finishes

Flooring Characteristics	*Do not use dark colours for impervious and play surfaces to reduce heat island effects and protect children from hot surfaces. Very light and reflective materials are not acceptable as they cause glare problems. All play and walking surfaces will be non-slip. Although natural plantings are preferred, artificial turf may be used for small areas of roof-top play areas providing that sand (rather than rubber chips) is used as the medium to hold it in place and that the turf specified is to the satisfaction of Community Care Facilities Licensing (CCFL). All safety information regarding the product is to be submitted to CCFL for their review. Playground fall protection surfaces: Acceptable products must meet CCFL requirements and include: - Engineered wood chip system complete with drainage, for example Fibar System 300. - Poured-in-place rubber system. - Or other pre-approved alternate.*

Ceiling Finishes

Ceiling Characteristics	*The covered play area will be covered with glazed canopy- provide tempered laminated glazing.*

Equipment and Accessories

Furniture, Fixtures and Equipment

Fences:

Minimum heights (all heights to be measured above any climbable permanent fixture located within 1.22 metres of the fence such as planters, benches, play equipment:

- 1.22 metres minimum typically.
- 1.82 metres where the grade outside the fence drops by at least 0.6 metres or a down slope of greater than 45°.
- 2.44 metres where the grade outside the fence drops by at least 3.05 metres, for example at a roof top. 1.82 metres with an extra 0.6 metres sloping 45°inwards is also acceptable.
- 1.82 metres at any pool, pond or body of water.

- Exterior glazed perimeter fencing will require visual markers to mitigate birds from colliding with glazing per City of Vancouver Bird Friendly Design Guidelines, as per Schedule 1- 6.7.1.1 (4).

For all the playground equipment requirements refer to Appendix 1E- Childcare Centre Requirements section 4.2.4.4 - Playground equipment requirements, 4.2.4.3 - Fall protection clearance requirements and depths guidelines

For all the playground leak detection system requirements refer to Appendix 1E- Childcare Centre Requirements section 4.2.6.2 - Roofs.

- Sand depth of sandboxes : minimum 0.305 metres in toddler outdoor play area

-Provide a covered weather-proof video/audio answer station which will have a keyed lock box.

-Provide removable solar shades for a portion of the outdoor play area, specifically over play elements such as the sandbox.

Plumbing Requirements

Water supply		Fixtures	
Cold Water (potable)	☑	Other	☑ *All drains to have removable and cleanable sediment traps. for requirement regarding sediment traps refer to Appendix 1E - 4.2.13.3 (1) and 4.2.13.3 (2). Hose bibs to be provided: Two in each outdoor play area, one at the building, one near sand box or children's urban agriculture plots. for requirements regarding hose bibs refer to Appendix 1E - 4.2.13.3 (5).*

Electrical Requirements

Power

General Power	For electrical requirements regarding access control refer to Appendix 1E - 4.2.16.2 (7). For requirements regarding local alarm and RTE buttons see Appendix 1E - 4.2.8.4 (9) and 4.2.8.4 (10).
Duplex Min. Qty	As per Appendix 1E - 4.2.14.1 (4) provide GFCI receptacles

Lighting

Luminaire Type

LED	☑

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3 (8)- illuminate entries, exits, high activity areas and security As per Appendix 1E - 4.2.14.3 (9) - HOA controls for servicing*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Doors to be fully glazed with tempered glass. - Swing doors or gates to have a hold open device such as a hook and eye, an “elephant’s foot” stop. or similar. -Sliding doors to play areas to have the ability to pin in place at open position to avoid injury from unsupervised sliding. -Kick plates are required on the push side of all doors with closers - kick plates minimum 0.30 metres high. - doors to have locks with 'classroom' function. - At all entrances from the outdoors provide walk-off mats (minimum size will allow for an adult to take two steps before stepping onto another flooring surface). - Deadbolt locks will be provided on both sides of low gates to exterior. Low gates between play areas, provide ball handsets only. - For requirements for Hardware and security, refer to Appendix 1E-Childcare Centre Requirements sections 4.2.8.4 - Hardware and 4.2.16.2 -Access Control, 4.2.16.3 - Intrusion Alarm and 4.2.16.4 - Enterphones .*

Department: **15 - Childcare 02 - Toddler**

Minimum Area: **2.80** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies
It will be adjacent to outdoor space of Toddler Group.

Equipment and Accessories

Furniture, Fixtures and Equipment

Exterior Playground Storage Shelving:

- Adjustable shelving, heavy duty, wire racks
- 4 rows of shelves, each shelf 0.45 metres-0.50 metres deep
- Lowest shelf - 0.76 metres from ground
- 0.50 metres gap between rows

Electrical Requirements

Power

Duplex Min. Qty	*1* As per Appendix 1E - 4.2.14.1 (4) provide GFCI receptacles

Lighting

Luminaire Type

LED	☑

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3 (8)- illuminate entries, exits, high activity areas and security As per Appendix 1E - 4.2.14.3 (9) - HOA controls for servicing As per Appendix 1E - 4.2.14.4 (6) (7) - occupancy sensors required*

Room Design - Door & Window Requirements

Doorsets

Remarks *-Kick plates are required at all storage room doors. Kick plates must be minimum 0.30 metres high. - doors to have locks with 'classroom' or 'storeroom' function. - Swing doors or gates to have a hold open device such as a hook and eye, an “elephant’s foot” stop. or similar. -Flush bolts at top + bottom on inactive leaf are required.*

Department: **15 - Childcare 03 - Preschooler**

Minimum Area: **84.50** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions

The activity room will be the largest of the program spaces. It will include a mixture of open spaces and smaller alcove-type spaces and be designed to accommodate a variety of activity settings. The design will emphasize flexibility by utilizing movable elements to define spaces.

Critical Adjacencies

Adjacent to outdoor covered area, with a view to outdoor play spaces.

Zone the activity settings such that noisy and quiet, intense and calm and messy (or wet) and tidy activities are separated. These zones will be shown on submitted plans.

The messy/wet zone will be used for art activities and eating and will be located adjacent to the kitchen and to the outdoor play area so that on sunny days, doors can be open and activities can flow between indoor and outdoor areas. There will be enough space for art/eating tables, easels, water and texture tables, and storage. Enough space is required to seat all children at once for snacks and meals.

Design Features

Large settings such as dramatic play and large blocks, will be represented in planning by a 3.0 metres diameter circle. Small settings for intense activities such as puzzles will be represented by a 2.0 metres diameter circle (size varies by age group and activity). Movement activities require a dedicated area which will include convenient storage for wheeled toys, large blocks, musical instruments, and climbing equipment.

An irregular square with alcoves and nooks is a suitable shape for the room. Avoid long narrow rooms. The plan will direct children from one activity to the next and delineate, protect and support activities in each setting.

Circulation within an activity room will be clear and straightforward, but not overly simplified and uninteresting. The optimum circulation path is highly visible and snakes through space, overlooking each activity. "Shopping" among activities is itself an activity. Circulation paths will respect the boundaries of activity areas by meandering around but not passing through activity settings. Allow space for children engaged in activities to play uninterrupted by others passing by them.

Room Finishes

Floor Finishes	
Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*
Ceiling Finishes	
Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*
Wall Finishes	
Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Wall Protection	
Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

- Notice boards or other strategy is required for the display of children's projects.

Millwork:

- Staff Counter - refer to Section 4.3.3 for CAD drawings and dimensions.

- Art counter with sink: min. 2.44 metres long in Preschooler Activity Room - refer to Section 4.3.6 for CAD drawings and dimensions. - Provide backsplash min 0.6 metres high or to underside of cabinets above.

Accessories:

- Paper towel dispensers to accommodate single-fold towels with no saw tooth cutting bar - Provide 1 at each art sink.

- Soap dispensers: Provide one wall-mounted soap dispenser at each sink.

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑
Notes	☑ *Hot water to be temperature adjustable 38-40 degrees Celsius (max 49 degrees Celsius)*

Sink Types

Other	☑ *Art sink: to be stainless steel complete with a faucet ledge. 0.30 metres deep sink. Gooseneck faucet with handspray. Provide a floor mounted Zurn sediment trap at (Z1180 Solids Interceptor) all art sinks.*

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*
Remarks	*Individual room temperature control. CO2 monitoring through BMS.*

Electrical Requirements

Power

General Power	For electrical requirements regarding access control refer to Appendix 1E - 4.2.16.2 (7). For requirements regarding local alarm and RTE buttons see Appendix 1E - 4.2.8.4 (9) and 4.2.8.4 (10).
Duplex Min. Qty	*6* As per Appendix 1E - 4.2.14.1
Other Duplex Min. Qty	*1* Above counter, adjacent to telephone outlet. To be coordinated with staff counter.

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 2*
Data	☑ *CAT6 Drop Min Qty: 4*
Remarks	*Two (2) CAT6 drops at staff counter for IP phones (coordinate with millwork). Two (2) CAT3 drops at staff counter for analog phones (coordinate with millwork). RG6 cable outlet.*

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (b) 420 lux min*

Lighting Control

Multi-Level	☑ *As per Appendix 1E - 4.2.14.4 (2)*
Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Doors to be fully glazed with tempered glass. - Swing doors or gates to have a hold open device such as a hook and eye, an “elephant’s foot” stop. or similar. -Kick plates are required on the push side of all doors with closers - kick plates minimum 0.30 metres high. - doors to have locks with 'classroom' function -Painted doors and door frames to be G5 'Gloss Level' (semi-gloss). - At all entrances from the outdoors provide walk-off mats (minimum size will allow for an adult to take two steps before stepping onto another flooring surface). - Blinds required on door glazing (and secured on bottom with child-safe device). - Child-proof thumb-turn deadbolt on all non-emergency exit doors to exterior is required. - flush-bolt at top and bottom for inactive leaf is required. - For requirements for Hardware and security, refer to Appendix 1E-Childcare Centre Requirements sections 4.2.8.4 - Hardware and 4.2.16.2 -Access Control, 4.2.16.3 - Intrusion Alarm and 4.2.16.4 - Enterphones .*

Windows

Exterior Window Required ☑ ☑ *Operable - Note, exterior windows in children’s areas will be at a height that children can see out. If at a height accessible to children , it must be screened and restricted to a max opening of 100 millimetres. If opening onto a walkway or play area , slider recommended.*

Window Covering Notes - *Blinds to be installed on all exterior windows. - All blinds to be commercial grade; chain operated roller style preferred. - All cords or chains to terminate 1.5 metres above the floor, or to be supported on a hook at that height.*

Department: **15 - Childcare 03 - Preschooler**

Minimum Area: **30.00** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies
The gross motor/nap room will be designed to open to the Activity Room to enable shared use and to enhance flexibility.

The room will be located away from outdoor play areas.

Design Features

Nap room layout will allow for approximately 0.61 metres between mats or cots.

Additional Remarks
Provide space for children's personal storage (baskets with personal effects for each child in) in gross motor/nap room - near mat storage is best (room no. 15.03.003).

Room Finishes

Floor Finishes

Flooring Characteristics	*- Carpet is required in all nap rooms - Base to be rubber, continuous throughout, and minimum 0.1 metres. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" painting For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Mats Required: Number required equal to licensed capacity plus an extra 20% for part-time children - 25 + 5= 30 mats (see room no. 15.03.003)

Millwork:

Music shelves - refer to Section 4.3.14 - Music shelf for CAD drawings and dimensions.

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*
Remarks	*Individual room temperature control. CO2 monitoring through BMS.*

Electrical Requirements

Power

Duplex Min. Qty	*4* As per Appendix 1E - 4.2.14.1 (1) Child-proof and shatter-proof faceplates (TYP). As per Appendix 1E - 4.2.14.1 (3) Provide duplex receptacle at music shelf @ 1.327 metres AFF.

Communication Requirements

Communication Systems

Data	☑ *CAT6 Drop Min Qty: 2*

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (a) 320 lux min*

Lighting Control

Multi-Level	☑ *As per Appendix 1E - 4.2.14.4 (2)*
Dimmer	☑ *As per Appendix 1E - 4.2.14.4 (3)*
Remarks	*As per Appendix 1E - 4.2.14.3. Provide dimmable wall sconces in addition to general lighting Switches located outside the room as per Appendix 1E - 4.2.14.4 (5) No un-switched lights (eg security lighting) as per Appendix 1E - 4.2.14.4 (4)*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Doors to be fully glazed with tempered glass. - Darkening blinds to be installed on nap room windows and on door glazing. Ensure blinds on doors are secured on the bottom with a child safe device. - Swing doors or gates to have a hold open device such as a hook and eye, an "elephant's foot" stop. or similar. -Kick plates are required on the push side of all doors with closers - kick plates minimum 0.30 metres high. - doors to have locks with 'passage' function -Flush bolts on inactive leaf are required.*

Windows

Window Covering Notes - *Darkening blinds to be installed on nap room windows and on door glazing. - All cords or chains to terminate 1.5 metres above the floor, or to be supported on a hook at that height.*

Department: **15 - Childcare 03 - Preschooler**

Minimum Area: **4.50** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies
It will be adjacent to the gross motor/nap room.

Design Features

Mats must be stored in such a way that they do not touch each other

Additional Remarks

All storage will be designed to address seismic safety concerns by ensuring that tall, heavy cupboards and other furniture items are fixed to the wall.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*In case of having no ceiling in the storage room, all exposed structure and services will be painted (refer to paint section at 4.2.9.2).*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Millwork required - refer to Section 4.3.15 - Sleep Mat Storage for CAD drawings and dimensions.

- Provide sleep mat storage for 30 mats, per 15.03.002-equipment and accessories.

HVAC Requirements

HVAC

Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*2* As per Appendix 1E - 4.2.14.1

Lighting

Luminaire Type

LED	☑

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3 As per Appendix 1E - 4.2.14.4 (6) (7) - occupancy sensors required*

Room Design - Door & Window Requirements

Doorsets

Remarks *Wood door-Kick plates are required on the push side , minimum 0.30 metres high. - doors to have locks with 'storeroom' function. -If sliding doors are used, they will have the ability to pin in place at open position.*

Department: **15 - Childcare 03 - Preschooler**

Minimum Area: **9.00** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions

The Quiet Room will be a separate room with a door, which can be used for quiet activities involving one staff and up to 3 children. There will be enough space for a small table, chairs and some storage.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Carpet is required in all quiet rooms. - Base to be rubber, continuous throughout, and minimum 0.1 metres. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" painting For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Millwork:

Music shelves optional - refer to Section 4.3.14 - Music shelf for CAD drawings and dimensions.

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*
Remarks	*Individual room temperature control.*

Electrical Requirements

Power

Duplex Min. Qty	*3* As per Appendix 1E - 4.2.14.1

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (a) 320 lux min*

Lighting Control

Multi-Level	☑ *As per Appendix 1E - 4.2.14.4 (2)*
Dimmer	☑ *As per Appendix 1E - 4.2.14.4 (3)*
Remarks	*As per Appendix 1E - 4.2.14.3. Provide dimmable wall sconces in addition to general lighting. Switches located outside the room as per Appendix 1E - 4.2.14.4 (5) No un-switched lights (eg security lighting) as per Appendix 1E - 4.2.14.4 (4)*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Doors to be fully glazed with tempered glass. - Swing doors or gates to have a hold open device such as a hook and eye, an “elephant’s foot” stop. or similar. -Kick plates are required on the push side of all doors with closers - kick plates minimum 0.30 metres high. - doors to have locks with 'passage' function -Painted doors and door frames to be G5 'Gloss Level' (semi-gloss).*

Windows

Window Covering Notes - *All blinds to be commercial grade; chain operated roller style preferred. - Blinds to be installed at interior windows and glazed doors. Ensure blinds on doors are secured on the bottom with a child safe device. - All cords or chains to terminate 1.5 metres above the floor, or to be supported on a hook at that height.*

Department: **15 - Childcare 03 - Preschooler**

Minimum Area: **14.00** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions
A separate cubby area will be provided for each Group.

Critical Adjacencies
This area will be directly accessible to the washroom and to the outdoor covered play area. And it will open up to the main activity area.

The cubby area is best located immediately inside the entry used by children when using the outdoor play yard. This arrangement ensures that wet and muddy outer clothes and boots are not brought into the activity areas of the childcare.

Design Features
There will be open floor space for a group of eight children and one staff to get dressed for winter conditions separated from the activities of the other children.

At all entrances from the outdoors provide walk-off mats (minimum size will allow for an adult to take two steps before stepping onto another flooring surface). A child- safe recessed grille is preferred, surface walk-off mats are also acceptable.

Additional Remarks
Provide space for children's personal storage (baskets with personal effects for each child in) in cubbies.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Notice boards:

- Program Entry to have at least two Cork Boards - Minimum 0.91 metres W x 0.61 metres H to 1.52 metres W x 0.91 metres H. The larger the size that can be accommodated, the better.

- Also provide cork board above Parent's sign-in desk, coordinate with millwork.

Millwork:

- Parent sign-in desk - refer to Section 4.3.1 for CAD drawings and dimensions.
- Children's cubbies (number required equal to the licensed capacity plus an extra 20% for part-time children). 25 + 5 = 30 cubbies - refer to Section 4.3.5 for CAD drawings and dimensions.
- Hooks / space for staff coats and shoes: 4 per program Group. These need to be at or near cubbies.
- Half-height millwork gate. Minimum 25 millimetres clearance under door. Full length piano hinge is required. Swing doors or gates to have a hold open device such as a hook and eye, an "elephant's foot" stop. or similar.

HVAC Requirements

HVAC

Minimum Temp (C)	*21*

Electrical Requirements

Power

General Power	
	For electrical requirements regarding access control refer to Appendix 1E - 4.2.16.2 (7) and 4.2.16.2 (8).
	For requirements regarding local alarm and RTE buttons see Appendix 1E - 4.2.8.4 (10).
Other Duplex Min. Qty	*1* Above counter, adjacent to telephone outlet.
	To be coordinated with parent's sign-in desk.

Lighting

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Doors to be fully glazed with tempered glass. - Swing doors or gates to have a hold open device such as a hook and eye, an "elephant's foot" stop. or similar. -Kick plates are required on the push side of all doors with closers - kick plates minimum 0.30 metres high. - doors to have locks with 'classroom' function. - At all entrances from the outdoors provide walk-off mats (minimum size will allow for an adult to take two steps before stepping onto another flooring surface). - For requirements for Hardware and security, refer to Appendix 1E-Childcare Centre Requirements sections 4.2.8.4 - Hardware and 4.2.16.2 -Access Control, 4.2.16.3 - Intrusion Alarm and 4.2.16.4 - Enterphones .*

Other Doors *Other* ☑ *half-height millwork gate*

Department:	**15 - Childcare 03 - Preschooler**
Minimum Area:	**9.50**
Ceiling Height:	**2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions

Two Groups can share one kitchen if it is readily accessible by both Groups. If kitchen is shared by two (2) Groups the total kitchen area will be at least 12 SM.

An open kitchenette (along a wall) is not permissible.

Critical Adjacencies

Kitchen will be directly accessible from main activity area.

Design Features

Kitchens may be located in an alcove within the primary activity space but separated from the Activity Room by a child-height counter. This permits children to be included in the kitchen activities without bringing them into the kitchen itself with its safety concerns. It also allows staff to supervise activities in the Activity Room while in the kitchen.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. - Ceiling finishes in kitchen must be washable. For general requirements for ceiling finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Magnetic White Board: Minimum 0.91 metres W x 0.91 metres H to 1.52 metres W x 0.91 metres H. The larger the size that can be accommodated, the better.

Millwork:

Kitchen - refer to Section 4.3.7 for CAD drawings and dimensions. - Provide backsplash min 0.6 metres high or to underside of cabinets above.

- Half-height millwork gate. Minimum 25 millimetres clearance under door. Full length piano hinge is required. Swing doors or gates to have a hold open device such as a hook and eye, an “elephant’s foot” stop. or similar.

Accessories:

- Paper towel dispensers to accommodate single-fold towels with no saw tooth cutting bar - Provide 1 at each sink in kitchens.

- Soap dispensers: Provide one wall-mounted soap dispenser at each sink.

Equipment:

For general requirements for equipment refer to Appendix 1E -Childcare Centre Requirements section 4.2.11 - Equipment

In case of sharing the kitchen with Preschool Group:

- Dishwasher - Commercial style dishwasher with a sani-cycle, 70 degrees Fahrenheit heat booster, and back-flow preventer valve. Note that these dishwashers require deeper than standard millwork: millwork to be designed to suit. Moyer Diebel model #501HT with 70 degree F rise booster or approved equivalent.

- Stove with oven: 0.76 metres wide, with 4 burners; placement of controls to be suitable for child safety, for example at back; self-cleaning convection oven. (separate wall oven and range top are also acceptable). Whirlpool model #YWFE710HOBW or approved equivalent.

- Range hood to mechanically exhaust stove to the outside; exhaust rate (CFM) to be determined by HVAC engineer. GE model #JV635NWWC or approved equivalent.

- Microwave oven: 2.0 cubic feet, 1100 watt, minimum. Panasonic model #NNSN968W or approved equivalent.

- Each Program will require its own full-sized fridge in the kitchen(w/ Freezer)- 18.5 cubic feet, 0.76 metres W, and one upright freezer for each kitchen (20.1 cu ft) - this is shared between two programs, and can be in a storage room). Refrigerator to be Whirlpool model #EB9FVHXWQ or approved equivalent. Upright Freezer to be Whirlpool model #EV200NZTQ or approved equivalent.

In case of having a dedicated kitchen:

- All equipment same as above except:
One full-size fridge (w/freezer) required - 21.5 cubic feet, frost free, 0.76 metres W - No separate freezer required.

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Handwash	☑ *Qty: 1*
Double	☑

Fixtures

Floor Drain	☑ *Qty: 1*
Notes	*In each kitchen provide a two-compartment stainless steel sink complete with faucet ledge. Provide a separate single compartment stainless steel hand washing sink, complete with faucet ledge.*

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

Duplex Min. Qty	As per Appendix 1E - 4.2.14.1 Power provision as per Appendix 1E - 4.2.14.1 (9)/ (10)

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14. 3 (2) (c) 540 lux min*

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Other Doors *Other* ☑ *half-height millwork gate*

Department: **15 - Childcare 03 - Preschooler**

Minimum Area: **8.00** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

To be accessed from the Activity room: a walk in closet with adjustable shelves on either side with central circulation is preferred but not required.

Design Features

A closet will be provided to store emergency supplies including a 3-day supply of food and water. The emergency supply closet can be incorporated in one of the program storage spaces.

Size requirements:

Food/water: 0.6 metres D x 0.6 metres H x 1.1 metres H

Equipment bag: 2 @ 0.6 metres x 0.8 metres x 0.6 metres

Additional Remarks

Adjustable shelves will be mechanically fastened to support bracket. All storage will be designed to address seismic safety concerns by ensuring that all furnishings greater than 1.2 metres high, heavy cupboards and other furniture items are fixed to the wall.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*In case of having no ceiling in the storage room, all exposed structure and services will be painted (refer to paint section at 4.2.9.2).*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

For Interior Storage Rooms Shelving:

- All open shelving to be mechanically fastened.

- Adjustable shelving, heavy duty, wood

- 4 rows of shelves, each shelf 0.45 metres deep

- Lowest shelf - 0.76 metres from ground

- 0.40 metres gap between rows

HVAC Requirements

HVAC

Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*2* As per Appendix 1E - 4.2.14.1

Lighting

Luminaire Type

LED	☑

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3 As per Appendix 1E - 4.2.14.4 (6) (7) - occupancy sensors required*

Room Design - Door & Window Requirements

Doorsets

Remarks *Wood door-Kick plates are required on the push side , minimum 0.30 metres high. - doors to have locks with 'storeroom' function. -Painted doors and door frames to be G5 'Gloss Level' (semi-gloss).*

Department:	**15 - Childcare 03 - Preschooler**		
Minimum Area:	**9.00**	*Ceiling Height:* **2440.00**	

Room Design Requirements

General Design Requirements

Critical Adjacencies

Immediately accessible from the cubby and activity areas. Staff will be able to visually supervise the entrance to the washroom from the main activity area.

Design Features

The dimensions for children's reach to faucets for Preschooler:

- Distance from front of counter to the tap/paddle = 457 millimetres
- Distance from edge of sink to front edge of counter = 70 millimetres
- Distance from edge of soap dispenser to edge of counter = 152 millimetres

Additional Remarks

For the Preschoooler Group area, provide space (approximately 0.60 metres x 1.00 metre) for a change mat to be placed on the floor. A change table is not required.

Provide space for children's personal storage (baskets with personal effects for each child in) in washroom.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

- Magnetic White Board: Minimum 0.91 metres W x 0.91 metres H to 1.52 metres W x 0.91 metres H. The larger the size that can be accommodated, the better.

-Above counter mirrors - in case of using full-height mirrors, or at mirrors adjacent to change tables, use shatter-proof acrylic rather than glass.

Millwork - refer to Section 4.3.9 for CAD drawings and dimensions:

- Vanities - All counters with sinks will have minimum 100 millimetres backsplashes and sidesplashes.

- Upper open shelving for baskets of children's personal needs – diapers, cream, toothbrushes etc.

- Moveable steps for larger children (1 per washroom) - store under counter at or near change table.

Washroom Accessories:

-All stalls with partitions and doors - Note: These doors will be able to held open in open position and also closable/lockable).

- Paper towel dispensers to accommodate single-fold towels with no saw tooth cutting bar - Provide 2 at child height at the Preschooler washroom.

- Provide a waste receptacle in each washroom: recessed receptacles preferred.

- Soap dispensers: Provide one lavatory-mounted soap dispenser at each children sink.

- Toilet paper dispensers - Provide one adjacent to each toilet in children's washrooms at child height.

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑
Notes	☑ *Hot water to be temperature adjustable 38-40 degrees Celsius (max 49 degrees Celsius)*

Sink Types

Lavatory	☑ *Qty: 4*

Fixtures

WC	☑ *Qty: 3 (full size)*
Floor Drain	☑ *Qty: 1*
Notes	*Each plumbing fixture to have own shut-off valve. All children's toilets to be tank style with round bowls and closed front toilet seats. At Preschooler washroom provide per Group minimum: - Three toilets, full size, sealed to the floor, complete with closed front toilet seat. Provide privacy for one toilet (refer to 4.3.9 Drawings). - Four child-accessible hand basins with lever faucets (refer to 4.3.9 Drawings). Having four hand basins allows the use of the space by out-of-school care.*

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1*

GFCI receptacles will be tamper resistant and childproof as per Appendix 1E - 4.2.14.1 (1)/(2)

Lighting

Luminaire Type	
LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (c) 540 lux min; glare shielding for diaper change areas*
Lighting Control	
Remarks	*As per Appendix 1E - 4.2.14.3*

Department: **15 - Childcare 03 - Preschooler**

Minimum Area: **6.00** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions

A small separate room will be provided for parents as a resource room for reading, staff/parent conferences, or breast feeding. One parent room may be shared by two or more Groups.

Critical Adjacencies

It will be private from the program areas and separate from the staff office.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Carpet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Notice board:

Cork Boards with Trim: 0.91 metres W x 0.61 metres H

Millwork:

Counter top with cabinets in parent room with display area and shelving above for educational materials - refer to Section 4.3.2 - Parent room display for CAD drawings and dimensions.

- All furnishings greater than 1.2 metres high require seismic restraints (ie. to be fixed to the wall.)

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*
Remarks	*Individual room temperature control.*

Electrical Requirements

Power

Duplex Min. Qty	*3* As per Appendix 1E - 4.2.14.1
Other Duplex Min. Qty	*1* Above counter, adjacent to telephone outlet. To be coordinated with parent room display.

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 2*
Data	☑ *CAT6 Drop Min Qty: 5*
Remarks	*Two (2) CAT6 drops at counter for IP phone (coordinate with millwork). Two (2) CAT3 drops at counter for analog phone (coordinate with millwork). One (1) CAT6 drop at 1.2m location to be coordinated with the City of Vancouver. RG6 cable outlet.*

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (a) 320 lux min.*

Lighting Control

Dimmer	☑ *As per Appendix 1E - 4.2.14.4 (3)*
Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Remarks *Wood door-Kick plates are required on the push side , minimum 0.30 metres high. - doors to have locks with 'classroom' function. -Painted doors and door frames to be G5 'Gloss Level' (semi-gloss).*

Windows

Internal Glazing *Y/N* ☑ *Type Provide a one-way mirror for parents to be able to see children (the mirror will be transparent when looking from the parents room and reflective on the other side)*

Window Covering Notes - *All blinds to be commercial grade; chain operated roller style preferred. - Blinds to be installed at interior windows and glazed doors. Ensure blinds on doors are secured on the bottom with a child safe device. - All cords or chains to terminate 1.5 metres above the floor, or to be supported on a hook at that height.*

Department: **15 - Childcare 03 - Preschooler**

Minimum Area: **4.50** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions

This washroom will be large enough to permit assisted toileting and special physical care of handicapped children. One staff washroom may be shared by two or more Groups.

Additional Remarks

One Accessible shower for staff and disabled children is required in one of the staff washrooms or in the shared staff washroom.

It is preferred but not required to arrange the layout of shared staff facilities to create a clustered staff area comprised of a staff office, staff room and a staff washroom (with shower for end-of-trip facilities).

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

- Provide Mirrors - at mirrors adjacent to change tables, use shatter-proof acrylic rather than glass.

- Provide a change table in the adult washroom. If this is not millwork, it may be a prefabricated item.

Acceptable product: Koala Kare surface mounted change station that supports static loads up to 200 lbs complete with child protection straps - Or pre-approved alternate.

- All counters with sinks will have minimum 100 millimetres backsplashes and sidesplashes.

Washroom Accessories:

- Paper towel dispensers to accommodate single-fold towels with no saw tooth cutting bar - Provide 1 in the vicinity of each change table sink- provide one in each adult washroom.

- Provide a waste receptacle in each washroom: recessed receptacles preferred.

- Soap dispensers: Provide one wall-mounted soap dispenser at each sink.

- Toilet paper dispensers - Provide one adjacent to each toilet in adult washrooms.

- Provide grab bars for accessibility.

- Provide seat for accessible shower.

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑
Notes	☑ *Hot water to be temperature adjustable 38-40 degrees Celsius (max 49 degrees Celsius)*

Sink Types

Lavatory	☑ *Qty: 1*

Fixtures

Barrier Free WC	☑ *Qty: 1*
Floor Drain	☑ *Qty: 1*
Other	☑ *Wheelchair accessible shower - for staff and care of disabled children.*
Notes	*1 handicapped accessible WC 1 Hand basin Provide low-flow, gravity standard, and dual flush. Toilets to meet a Maximum Performance (MaP) Test of 500g or better.*

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1* GFCI receptacles will be tamper resistant and childproof in accordance with Appendix 1E - 4.2.14.1 (1)/(2)

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (c) 540 lux min*

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3 Occupancy sensors as per Appendix 1E - 4.2.14.4 (7)/ 4.2.14.4 (1)*

Room Design - Door & Window Requirements

Doorsets

Remarks *Wood door-Kick plates are required on the push side , minimum 0.30 metres high. - doors to have locks with 'Privacy' function. -Painted doors and door frames to be G5 'Gloss Level' (semi-gloss).*

Department: **15 - Childcare 03 - Preschooler**

Minimum Area: **7.00** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions

A single staff office may be shared by two or more Groups if it is easily accessible to each Group and within hearing range in case of emergency.

Critical Adjacencies

The offices will be accessible to each Group and be within hearing range of the primary activity area(s).

Design Features
Provide space for lockable filing cabinets.

Additional Remarks

It is preferred but not required to arrange the layout of shared staff facilities to create a clustered staff area comprised of a staff office, staff room and a staff washroom (with shower for end-of-trip facilities).

Room Finishes

Floor Finishes

Flooring Characteristics	*- Carpet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Notice board:

Cork Boards with Trim: 0.91 metres W x 0.61 metres H

Millwork:

Counter tops in staff offices with shelving above for workstations (if not provided as furniture) - refer to Section 4.3.13 - Staff Office for CAD drawings and dimensions.

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*
Remarks	*Individual room temperature control.*

Electrical Requirements

Power

Duplex Min. Qty	*3* As per Appendix 1E - 4.2.14.1 and 4.2.14.1 (9)

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 2*
Data	☑ *CAT6 Drop Min Qty: 4*
Remarks	*Two (2) CAT6 drops at counter for IP phones (coordinate with millwork). Two (2) CAT3 drops at counter for analog phones (coordinate with millwork). RG6 cable outlet.*

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (c) 540 lux min*

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Remarks *Wood door-Kick plates are required on the push side , minimum 0.30 metres high. - doors to have locks with 'Privacy' function. -Painted doors and door frames to be G5 'Gloss Level' (semi-gloss).*

Department:	**15 - Childcare 03 - Preschooler**
Minimum Area:	**4.00**
Ceiling Height:	**2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions

A lockable laundry area and janitorial room will be provided which is not required to be accessible. One laundry/janitorial area may be shared by two or more Groups.

It is preferred but not required to have two separate rooms for laundry and janitorial.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*In case of having no ceiling in the storage room, all exposed structure and services will be painted (refer to paint section at 4.2.9.2).*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Millwork:

Laundry counter - refer to Section 4.3.12 - Laundry Counter for CAD drawings and dimensions.

Any base cabinets in the laundry room will be lockable.

- Provide backsplash min 0.6 metres high or to underside of cabinets above.

Laundry room with:

- Sink

- Adjustable storage shelves

- Paper towel dispensers to accommodate single-fold towels with no saw tooth cutting bar - Provide 1 at each sink.

- Soap dispensers: Provide one wall-mounted soap dispenser at each sink.

janitor room with:

- Floor sink- Provide backsplash on all sides min 0.6 metres high.

- Provide floor sink accessories:

  - service faucet.
  - hose + hose holder
  - mop hanger
  - wall/bumper guards

- Space for storing bucket, mops, brooms, vacuum, ladder, supplies for cleaning

- Adjustable shelves for paper products, light bulbs, etc.

Equipment:

Laundry room serving two or more program Groups:

2 Commercial washing machine - Specify a front-loading machine for water conservation. Maytag model #MHN30PR Commercial High-efficiency Front-load washer or approved equivalent.
2 Commercial dryer. Maytag model #MDE/MDG25PR Commercial Super Capacity Dryer or approved equivalent.
Side-by-side machines are required.

Laundry room serving one program Group:

1 Commercial washing machine - Specify a front-loading machine for water conservation. Maytag model #MHN30PR Commercial High-efficiency Front-load washer or approved equivalent.
1 Commercial dryer. Maytag model #MDE/MDG25PR Commercial Super Capacity Dryer or approved equivalent.
Side-by-side machines are required.

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Lavatory	☑ *Qty: 1*
Janitorial	☑ *Qty: 1*

Fixtures

Floor Drain	☑ *Qty: 1*
Notes	*Sink is required for each laundry room- refer to 4.3.12 - laundry counter for CAD drawing. Provide a floor-mounted mop sink in each laundry/janitorial room, complete with approved backflow preventer valve.*

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1* As per Appendix 1E - 4.2.14.1
Other Duplex Min. Qty	Receptacle types and quantities to match washer and dryer types and quantities.

Lighting

Luminaire Type

LED	☑

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Remarks *Wood door-Kick plates are required on the push side , minimum 0.30 metres high. - doors to have locks with 'storeroom' function. - If the Laundry/janitorial room is not opening to activity room, door material is not required to be wood.*

Department:	**15 - Childcare 03 - Preschooler**		
Minimum Area:	**350.00**	*Ceiling Height:*	

Room Design Requirements

General Design Requirements

Activities and Functions
Outdoor play areas will be designed and built to create a natural environment utilizing a variety of textures and natural materials.

Playground equipment, such as climbers, will be placed at the edge of the play area to maximize the available outdoor open play space.

The outdoor play space will include a covered area and an uncovered area to accommodate the various outdoor activities. Between 1/3 and 1/2 of the outdoor area will be clear space for group activities and physical movement.

Since open areas can be taken over by riding toys unless other opportunities are provided, a paved path or route for wheeled toys will wind around other activity areas.

Children will be free to move from activity to activity outdoors as they are indoors without disrupting activities in activity zones.
Critical Adjacencies
The outdoor space will be acoustically buffered from traffic and parking and other disruptive noises, fumes and odours. Particular attention will be given to the building's mechanical equipment and vents. Locate the Childcare outdoor space to reduce noise from children disturbing adjacent uses.

Design Features
Covered Outdoor 45NSM

Open Outdoor 305NSM

The covered play area will be covered with glazed canopy- provide tempered laminated glazing.

The outdoor play area is to be divided into play zones, For information about play zones refer to Appendix 1E- Childcare Centre Requirements section 2.3.2-Activity Zones.

Room Finishes

Floor Finishes

Flooring Characteristics	*Do not use dark colours for impervious and play surfaces to reduce heat island effects and protect children from hot surfaces. Very light and reflective materials are not acceptable as they cause glare problems. All play and walking surfaces will be non-slip. Although natural plantings are preferred, artificial turf may be used for small areas of roof-top play areas providing that sand (rather than rubber chips) is used as the medium to hold it in place and that the turf specified is to the satisfaction of Community Care Facilities Licensing (CCFL). All safety information regarding the product is to be submitted to CCFL for their review. Playground fall protection surfaces: Acceptable products must meet CCFL requirements and include: - Engineered wood chip system complete with drainage, for example Fibar System 300. - Poured-in-place rubber system. - Or other pre-approved alternate.*

Ceiling Finishes

Ceiling Characteristics	*The covered play area will be covered with glazed canopy- provide tempered laminated glazing.*

Equipment and Accessories

Furniture, Fixtures and Equipment

Fences:

Minimum heights (all heights to be measured above any climbable permanent fixture located within 1.22 metres of the fence such as planters, benches, play equipment:

- 1.22 metres minimum typically.
- 1.82 metres where the grade outside the fence drops by at least 0.6 metres or a down slope of greater than 45°.
- 2.44 metres where the grade outside the fence drops by at least 3.05 metres, for example at a roof top. 1.82 metres with an extra 0.6 metres sloping 45°inwards is also acceptable.
- 1.82 metres at any pool, pond or body of water.

- Exterior glazed perimeter fencing will require visual markers to mitigate birds from colliding with glazing per City of Vancouver Bird Friendly Design Guidelines, as per Schedule 1- 6.7.1.1 (4).

For all the playground equipment requirements refer to Appendix 1E- Childcare Centre Requirements section 4.2.4.4 - Playground equipment requirements, 4.2.4.3 - Fall protection clearance requirements and depths guidelines

For all the playground leak detection system requirements refer to Appendix 1E- Childcare Centre Requirements section 4.2.6.2 - Roofs.

- Sand depth of sandboxes : minimum 457 millimetres in preschooler outdoor play area

-Provide a covered weather-proof video/audio answer station which will have a keyed lock box.

-Provide removable solar shades for a portion of the outdoor play area, specifically over play elements such as the sandbox.

Plumbing Requirements

Water supply		Fixtures	
Cold Water (potable)	☑	Other	☑ *All drains to have removable and cleanable sediment traps. for requirement regarding sediment traps refer to Appendix 1E - 4.2.13.3 (1) and 4.2.13.3 (2). Hose bibs to be provided: Two in each outdoor play area, one at the building, one near sand box or children's urban agriculture plots. for requirements regarding hose bibs refer to Appendix 1E - 4.2.13.3 (5).*

Electrical Requirements

Power

General Power	For electrical requirements regarding access control refer to Appendix 1E - 4.2.16.2 (7). For requirements regarding local alarm and RTE buttons see Appendix 1E - 4.2.8.4 (9) and 4.2.8.4 (10).
Duplex Min. Qty	As per Appendix 1E - 4.2.14.1 (4) provide GFCI receptacles

Lighting

Luminaire Type

LED	☑

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3 (8)- illuminate entries, exits, high activity areas and security As per Appendix 1E - 4.2.14.3 (9) - HOA controls for servicing*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Doors to be fully glazed with tempered glass. - Swing doors or gates to have a hold open device such as a hook and eye, an “elephant’s foot” stop. or similar. -Sliding doors to play areas to have the ability to pin in place at open position to avoid injury from unsupervised sliding. -Kick plates are required on the push side of all doors with closers - kick plates minimum 0.30 metres high. - doors to have locks with 'classroom' function. - At all entrances from the outdoors provide walk-off mats (minimum size will allow for an adult to take two steps before stepping onto another flooring surface). - Deadbolt locks will be provided on both sides of low gates to exterior. Low gates between play areas, provide ball handsets only. - For requirements for Hardware and security, refer to Appendix 1E-Childcare Centre Requirements sections 4.2.8.4 - Hardware and 4.2.16.2 -Access Control, 4.2.16.3 - Intrusion Alarm and 4.2.16.4 - Enterphones .*

Department: **15 - Childcare 03 - Preschooler**

Minimum Area: **4.60** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies
It will be adjacent to outdoor space of Preschooler Group.

Equipment and Accessories

Furniture, Fixtures and Equipment

Exterior Playground Storage Shelving:

- Adjustable shelving, heavy duty, wire racks
- 4 rows of shelves, each shelf 0.45 metres -0.50 metres deep
- Lowest shelf - 0.76 metres from ground
- 0.50 metres gap between rows

Electrical Requirements

Power

Duplex Min. Qty	*1* As per Appendix 1E - 4.2.14.1 (4) provide GFCI receptacles

Lighting

Luminaire Type

LED	☑

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3 (8)- illuminate entries, exits, high activity areas and security As per Appendix 1E - 4.2.14.3 (9) - HOA controls for servicing As per Appendix 1E - 4.2.14.4 (6) (7) - occupancy sensors required*

Room Design - Door & Window Requirements

Doorsets

Remarks *-Kick plates are required at all storage room doors. Kick plates must be minimum 0.30 metres high. - doors to have locks with 'classroom' or 'storeroom' function. - Swing doors or gates to have a hold open device such as a hook and eye, an “elephant’s foot” stop. or similar. -Flush bolts at top + bottom on inactive leaf are required.*

Department: **15 - Childcare 04 - Preschool**

Minimum Area: **69.00** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions

The activity room will be the largest of the program spaces. It will include a mixture of open spaces and smaller alcove-type spaces and be designed to accommodate a variety of activity settings. The design will emphasize flexibility by utilizing movable elements to define spaces.

Critical Adjacencies

Adjacent to outdoor covered area, with a view to outdoor play spaces.

Zone the activity settings such that noisy and quiet, intense and calm and messy (or wet) and tidy activities are separated. These zones will be shown on submitted plans.

The messy/wet zone will be used for art activities and eating and will be located adjacent to the kitchen and to the outdoor play area so that on sunny days, doors can be open and activities can flow between indoor and outdoor areas. There will be enough space for art/eating tables, easels, water and texture tables, and storage. Enough space is required to seat all children at once for snacks and meals.

Design Features

Large settings such as dramatic play and large blocks, will be represented in planning by a 3.0 metres diameter circle. Small settings for intense activities such as puzzles will be represented by a 2.0 metres diameter circle (size varies by age group and activity). Movement activities require a dedicated area which will include convenient storage for wheeled toys, large blocks, musical instruments, and climbing equipment.

An irregular square with alcoves and nooks is a suitable shape for the room. Avoid long narrow rooms. The plan will direct children from one activity to the next and delineate, protect and support activities in each setting.

Circulation within an activity room will be clear and straightforward, but not overly simplified and uninteresting. The optimum circulation path is highly visible and snakes through space, overlooking each activity. "Shopping" among activities is itself an activity. Circulation paths will respect the boundaries of activity areas by meandering around but not passing through activity settings. Allow space for children engaged in activities to play uninterrupted by others passing by them.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

- Notice boards or other strategy is required for the display of children's projects.

Millwork:

- Staff Counter - refer to Section 4.3.3 for CAD drawings and dimensions.

- Art counter with sink: min. 2.44 metres long in Preschool Activity Room - refer to Section 4.3.6 for CAD drawings and dimensions. - Provide backsplash min 0.6 metres high or to underside of cabinets above.

Accessories:

- Paper towel dispensers to accommodate single-fold towels with no saw tooth cutting bar - Provide 1 at each art sink.

- Soap dispensers: Provide one wall-mounted soap dispenser at each sink.

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑
Notes	☑ *Hot water to be temperature adjustable 38-40 degrees Celsius (max 49 degrees Celsius)*

Sink Types

Other	☑ *Art sink: to be stainless steel complete with a faucet ledge. 0.30 metres deep sink. Gooseneck faucet with handspray. Provide a floor mounted Zurn sediment trap at (Z1180 Solids Interceptor) all art sinks.*

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*
Remarks	*Individual room temperature control. CO2 monitoring through BMS.*

Electrical Requirements

Power

General Power	For electrical requirements regarding access control refer to Appendix 1E - 4.2.16.2 (7). For requirements regarding local alarm and RTE buttons see Appendix 1E - 4.2.8.4 (9) and 4.2.8.4 (10).
Duplex Min. Qty	*6* As per Appendix 1E - 4.2.14.1
Other Duplex Min. Qty	*1* Above counter, adjacent to telephone outlet. To be coordinated with staff counter.

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 2*
Data	☑ *CAT6 Drop Min Qty: 4*
Remarks	*Two (2) CAT6 drops at staff counter for IP phones (coordinate with millwork). Two (2) CAT3 drops at staff counter for analog phones (coordinate with millwork). RG6 cable outlet.*

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (b) 420 lux min*

Lighting Control

Multi-Level	☑ *As per Appendix 1E - 4.2.14.4 (2)*
Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Doors to be fully glazed with tempered glass. - Swing doors or gates to have a hold open device such as a hook and eye, an “elephant’s foot” stop. or similar. -Kick plates are required on the push side of all doors with closers - kick plates minimum 0.30 metres high. - doors to have locks with 'classroom' function -Painted doors and door frames to be G5 'Gloss Level' (semi-gloss). - At all entrances from the outdoors provide walk-off mats (minimum size will allow for an adult to take two steps before stepping onto another flooring surface). - Blinds required on door glazing (and secured on bottom with child-safe device). - Child-proof thumb-turn deadbolt on all non-emergency exit doors to exterior is required. - flush-bolt at top and bottom for inactive leaf is required. - For requirements for Hardware and security, refer to Appendix 1E-Childcare Centre Requirements sections 4.2.8.4 - Hardware and 4.2.16.2 -Access Control, 4.2.16.3 - Intrusion Alarm and 4.2.16.4 - Enterphones .*

Windows

Exterior Window Required ☑ ☑ *Operable - Note, exterior windows in children’s areas will be at a height that children can see out. If at a height accessible to children , it must be screened and restricted to a max opening of 100 millimetres. If opening onto a walkway or play area , slider recommended.*

Window Covering Notes - *Blinds to be installed on all exterior windows. - All blinds to be commercial grade; chain operated roller style preferred. - All cords or chains to terminate 1.5 metres above the floor, or to be supported on a hook at that height.*

Department: **15 - Childcare 04 - Preschool**

Minimum Area: **9.00** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions

The Quiet Room will be a separate room with a door, which can be used for quiet activities involving one staff and up to 3 children. There will be enough space for a small table, chairs and some storage.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Carpet is required in all quiet rooms. - Base to be rubber, continuous throughout, and minimum 0.1 metres. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" painting For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Millwork:

Music shelves optional - refer to Section 4.3.14 - Music shelf for CAD drawings and dimensions.

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*
Remarks	*Individual room temperature control.*

Electrical Requirements

Power

Duplex Min. Qty	*3* As per Appendix 1E - 4.2.14.1

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (a) 320 lux min*

Lighting Control

Multi-Level	☑ *As per Appendix 1E - 4.2.14.4 (2)*
Dimmer	☑ *As per Appendix 1E - 4.2.14.4 (3)*
Remarks	*As per Appendix 1E - 4.2.14.3. Provide dimmable wall sconces in addition to general lighting. Switches located outside the room as per Appendix 1E - 4.2.14.4 (5) No un-switched lights (eg security lighting) as per Appendix 1E - 4.2.14.4 (4)*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Doors to be fully glazed with tempered glass. - Swing doors or gates to have a hold open device such as a hook and eye, an “elephant’s foot” stop. or similar. -Kick plates are required on the push side of all doors with closers - kick plates minimum 0.30 metres high. - doors to have locks with 'passage' function -Painted doors and door frames to be G5 'Gloss Level' (semi-gloss).*

Windows

Window Covering Notes - *All blinds to be commercial grade; chain operated roller style preferred. - Blinds to be installed at interior windows and glazed doors. Ensure blinds on doors are secured on the bottom with a child safe device. - All cords or chains to terminate 1.5 metres above the floor, or to be supported on a hook at that height.*

Department: **15 - Childcare 04 - Preschool**

Minimum Area: **12.00** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions

A separate cubby area will be provided for each Group.

Critical Adjacencies

This area will be directly accessible to the washroom and to the outdoor covered play area.

The cubby area is best located immediately inside the entry used by children when using the outdoor play yard. This arrangement ensures that wet and muddy outer clothes and boots are not brought into the activity areas of the childcare.

Design Features

There will be open floor space for a group of eight children and one staff to get dressed for winter conditions separated from the activities of the other children.

At all entrances from the outdoors provide walk-off mats (minimum size will allow for an adult to take two steps before stepping onto another flooring surface). A child- safe recessed grille is preferred, surface walk-off mats are also acceptable.

Additional Remarks

Provide space for children's personal storage (baskets with personal effects for each child in) in cubbies.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Notice boards:

- Program Entry to have at least two Cork Boards - Minimum 0.91 metres W x 0.61 metres H to 1.52 metres W x 0.91 metres H. The larger the size that can be accommodated, the better.

- Also provide cork board above Parent's sign-in desk, coordinate with millwork.

Millwork:

- Parent sign-in desk - refer to Section 4.3.1 for CAD drawings and dimensions.
- Children's cubbies (number required equal to the licensed capacity plus an extra 20% for part-time children). 20 + 4 = 24 cubbies - refer to Section 4.3.5 for CAD drawings and dimensions.
- Hooks / space for staff coats and shoes: 4 per program Group. These need to be at or near cubbies.

HVAC Requirements

HVAC

Minimum Temp (C)	*21*

Electrical Requirements

Power

General Power	For electrical requirements regarding access control refer to Appendix 1E - 4.2.16.2 (7) and 4.2.16.2 (8). For requirements regarding local alarm and RTE buttons see Appendix 1E - 4.2.8.4 (10).
Other Duplex Min. Qty	*1* Above counter, adjacent to telephone outlet. To be coordinated with parent's sign-in desk.

Lighting

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Doors to be fully glazed with tempered glass. - Swing doors or gates to have a hold open device such as a hook and eye, an "elephant's foot" stop. or similar. -Kick plates are required on the push side of all doors with closers - kick plates minimum 0.30 metres high. - doors to have locks with 'classroom' function. - At all entrances from the outdoors provide walk-off mats (minimum size will allow for an adult to take two steps before stepping onto another flooring surface). - For requirements for Hardware and security, refer to Appendix 1E-Childcare Centre Requirements sections 4.2.8.4 - Hardware and 4.2.16.2 -Access Control, 4.2.16.3 - Intrusion Alarm and 4.2.16.4 - Enterphones .*

Department:	**15 - Childcare 04 - Preschool**		
Minimum Area:	**9.00**	*Ceiling Height:* **2440.00**	

Room Design Requirements

General Design Requirements

Activities and Functions

Two Groups can share one kitchen if it is readily accessible by both Groups. If kitchen is shared by two (2) Groups the total kitchen area will be at least 12 SM.

An open kitchenette (along a wall) is not permissible.

Critical Adjacencies

Kitchen will be directly accessible from main activity area.

Design Features

Kitchens may be located in an alcove within the primary activity space but separated from the Activity Room by a child-height counter. This permits children to be included in the kitchen activities without bringing them into the kitchen itself with its safety concerns. It also allows staff to supervise activities in the Activity Room while in the kitchen.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. - Ceiling finishes in kitchen must be washable. For general requirements for ceiling finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Magnetic White Board: Minimum 0.91 metres W x 0.91 metres H to 1.52 metres W x 0.91 metres H. The larger the size that can be accommodated, the better.

Millwork:

Kitchen - refer to Section 4.3.7 for CAD drawings and dimensions. - Provide backsplash min 0.6 metres high or to underside of cabinets above.

Accessories:

- Paper towel dispensers to accommodate single-fold towels with no saw tooth cutting bar - Provide 1 at each sink in kitchens.

- Soap dispensers: Provide one wall-mounted soap dispenser at each sink.

Equipment:

For general requirements for equipment refer to Appendix 1E -Childcare Centre Requirements section 4.2.11 – Equipment

In case of sharing the kitchen with Preschooler Group:

- Dishwasher - Commercial style dishwasher with a sani-cycle, 70 degrees Fahrenheit heat booster, and back-flow preventer valve. Note that these dishwashers require deeper than standard millwork: millwork to be designed to suit. Moyer Diebel model #501HT with 70 degree F rise booster or approved equivalent.

- Stove with oven: 0.76 metres wide, with 4 burners; placement of controls to be suitable for child safety, for example at back; self-cleaning convection oven. (separate wall oven and range top are also acceptable). Whirlpool model #YWFE710HOBW or approved equivalent.

- Range hood to mechanically exhaust stove to the outside; exhaust rate (CFM) to be determined by HVAC engineer. GE model #JV635NWWC or approved equivalent.

- Microwave oven: 2.0 cubic feet, 1100 watt, minimum. Panasonic model #NNSN968W or approved equivalent.

- Each Program will require its own full-sized fridge in the kitchen(w/ Freezer)- 18.5 cubic feet, 0.76 metres W, and one upright freezer for each kitchen (20.1 cu ft) - this is shared between two programs, and can be in a storage room). Refrigerator to be Whirlpool model #EB9FVHXWQ or approved equivalent. Upright Freezer to be Whirlpool model #EV200NZTQ or approved equivalent.

In case of having a dedicated kitchen:

- All equipment same as above except:

One full-size fridge (w/freezer) required - 21.5 cubic feet, frost free, 0.76 metres W - No separate freezer required.

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

Sink Types

Handwash	☑ *Qty: 1*
Double	☑

Fixtures

Floor Drain	☑ *Qty: 1*
Notes	*In each kitchen provide a two-compartment stainless steel sink complete with faucet ledge. Provide a separate single compartment stainless steel hand washing sink, complete with faucet ledge.*

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

Duplex Min. Qty	As per Appendix 1E - 4.2.14.1 Power provision as per Appendix 1E - 4.2.14.1 (9)/ (10)

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14. 3 (2) (c) 540 lux min*

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3*

Department: **15 - Childcare 04 - Preschool**

Minimum Area: **9.00** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

To be accessed from the Activity room: a walk in closet with adjustable shelves on either side with central circulation is preferred but not required.

Design Features

A closet will be provided to store emergency supplies including a 3-day supply of food and water. The emergency supply closet can be incorporated in one of the program storage spaces.

Size requirements:

Food/water: 0.6 metres D x 0.6 metres H x 1.1 metres H

Equipment bag: 2 @ 0.6 metres x 0.8 metres x 0.6 metres

Additional Remarks

Adjustable shelves will be mechanically fastened to support bracket. All storage will be designed to address seismic safety concerns by ensuring that all furnishings greater than 1.2 metres high, heavy cupboards and other furniture items are fixed to the wall.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*In case of having no ceiling in the storage room, all exposed structure and services will be painted (refer to paint section at 4.2.9.2).*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

For Interior Storage Rooms Shelving:

- All open shelving to be mechanically fastened.

- Adjustable shelving, heavy duty, wood

- 4 rows of shelves, each shelf 0.45 metres deep

- Lowest shelf - 0.76 metres from ground

- 0.40 metres gap between rows

HVAC Requirements

HVAC

Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*2* As per Appendix 1E - 4.2.14.1

Lighting

Luminaire Type

LED	☑

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3 As per Appendix 1E - 4.2.14.4 (6) (7) - occupancy sensors required*

Room Design - Door & Window Requirements

Doorsets

Remarks *Wood door-Kick plates are required on the push side , minimum 0.30 metres high. - doors to have locks with 'storeroom' function.*

Department: **15 - Childcare 04 - Preschool**

Minimum Area: **7.00** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies

Immediately accessible from the cubby and activity areas. Staff will be able to visually supervise the entrance to the washroom from the main activity area. One partially screened toilet will be provided.

Design Features

The dimensions for children's reach to faucets for Preschooler:

- Distance from front of counter to the tap/paddle = 457 millimetres
- Distance from edge of sink to front edge of counter = 70 millimetres
- Distance from edge of soap dispenser to edge of counter = 152 millimetres

Additional Remarks

Provide space for children's personal storage (baskets with personal effects for each child in) in washroom.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

- Magnetic White Board: Minimum 0.91 metres W x 0.91 metres H to 1.52 metres W x 0.91 metres H. The larger the size that can be accommodated, the better.

- Above counter mirrors- in case of using full-height mirrors, or at mirrors adjacent to change tables, use shatter-proof acrylic rather than glass.

Millwork - refer to Section 4.3.9 for CAD drawings and dimensions:

- Vanities - All counters with sinks will have minimum 100 millimetres backsplashes and sidesplashes.

- Upper open shelving for baskets of children's personal needs – diapers, cream, toothbrushes etc.

- Moveable steps for larger children (1 per washroom) - store under counter at or near change table.

Washroom Accessories:

-All stalls with partitions and doors - Note: These doors will be able to held open in open position and also closable/lockable).

- Paper towel dispensers to accommodate single-fold towels with no saw tooth cutting bar - Provide 2 at child height at the Preschool washroom.

- Provide a waste receptacle in each washroom: recessed receptacles preferred.

- Soap dispensers: Provide one lavatory-mounted soap dispenser at each children sink.

- Toilet paper dispensers - Provide one adjacent to each toilet in children's washrooms at child height.

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑
Notes	☑ *Hot water to be temperature adjustable 38-40 degrees Celsius (max 49 degrees Celsius)*

Sink Types

Lavatory	☑ *Qty: 4*

Fixtures

WC	☑ *Qty: 3 (full size)*
Floor Drain	☑ *Qty: 1*
Notes	*Each plumbing fixture to have own shut-off valve. All children's toilets to be tank style with round bowls and closed front toilet seats. At Preschool washroom provide per Group minimum: - Three toilets, full size, sealed to the floor, complete with closed front toilet seat. Provide privacy for one toilet (refer to 4.3.9 Drawings). - Four child-accessible hand basins with lever faucets (refer to 4.3.9 Drawings). Having four hand basins allows the use of the space by out-of-school care. (refer to 4.3.9 Drawings).*

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1* GFCI receptacles will be tamper resistant and childproof as per Appendix 1E - 4.2.14.1 (1)/(2)

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (c) 540 lux min; glare shielding for diaper change areas*

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3*

Department: **15 - Childcare 04 - Preschool**

Minimum Area: **4.50** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions

This washroom will be large enough to permit assisted toileting and special physical care of handicapped children. One staff washroom may be shared by two or more Groups.

Additional Remarks

One Accessible shower for staff and disabled children is required in one of the staff washrooms or in the shared staff washroom.

It is preferred but not required to arrange the layout of shared staff facilities to create a clustered staff area comprised of a staff office, staff room and a staff washroom (with shower for end-of-trip facilities).

Room Finishes

Floor Finishes

Flooring Characteristics	*- Resilient sheet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

- Provide Mirrors - at mirrors adjacent to change tables, use shatter-proof acrylic rather than glass.

- Provide a change table in the adult washroom. If this is not millwork, it may be a prefabricated item.

Acceptable product: Koala Kare surface mounted change station that supports static loads up to 200 lbs complete with child protection straps - Or pre-approved alternate.

All counters with sinks will have minimum 100 millimetres backsplashes and sidesplashes.

Washroom Accessories:

- Paper towel dispensers to accommodate single-fold towels with no saw tooth cutting bar - Provide 1 in the vicinity of each change table sink- provide one in each adult washroom.

- Provide a waste receptacle in each washroom: recessed receptacles preferred.

- Soap dispensers: Provide one wall-mounted soap dispenser at each sink.

- Toilet paper dispensers - Provide one adjacent to each toilet in adult washrooms.

- Provide grab bars for accessibility.

- Provide seat for accessible shower.

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑
Notes	☑ *Hot water to be temperature adjustable 38-40 degrees Celsius (max 49 degrees Celsius)*

Sink Types

Lavatory	☑ *Qty: 1*

Fixtures

Barrier Free WC	☑ *Qty: 1*
Floor Drain	☑ *Qty: 1*
Other	☑ *Wheelchair accessible shower - for staff and care of disabled children.*
Notes	*1 handicapped accessible WC 1 Hand basin Provide low-flow, gravity standard, and dual flush. Toilets to meet a Maximum Performance (MaP) Test of 500g or better.*

HVAC Requirements

HVAC

Exhaust	☑
Minimum Temp (C)	*21*

Electrical Requirements

Power

Duplex Min. Qty	*1* GFCI receptacles will be tamper resistant and childproof in accordance with Appendix 1E - 4.2.14.1 (1)/(2)

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (c) 540 lux min*

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3 Occupancy sensors as per Appendix 1E - 4.2.14.4 (7)/ 4.2.14.4 (1)*

Room Design - Door & Window Requirements

Doorsets

Remarks *Wood door-Kick plates are required on the push side , minimum 0.30 metres high. - doors to have locks with 'Privacy' function. -Painted doors and door frames to be G5 'Gloss Level' (semi-gloss).*

Department: **15 - Childcare 04 - Preschool**

Minimum Area: **7.50** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions

A single staff office may be shared by two or more Groups if it is easily accessible to each Group and within hearing range in case of emergency.

Critical Adjacencies

The offices will be accessible to each Group and be within hearing range of the primary activity area(s).

Design Features
Provide space for lockable filing cabinets.

Additional Remarks

It is preferred but not required to arrange the layout of shared staff facilities to create a clustered staff area comprised of a staff office, staff room and a staff washroom (with shower for end-of-trip facilities).

Room Finishes

Floor Finishes

Flooring Characteristics	*- Carpet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Notice board:

Cork Boards with Trim: 0.91 metres W x 0.61 metres H

Millwork:

Counter tops in staff offices with shelving above for workstations (if not provided as furniture) - refer to Section 4.3.13 - Staff Office for CAD drawings and dimensions.

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*
Remarks	*Individual room temperature control.*

Electrical Requirements

Power

Duplex Min. Qty	*3* As per Appendix 1E - 4.2.14.1 and 4.2.14.1 (9)

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 2*
Data	☑ *CAT6 Drop Min Qty: 4*
Remarks	*Two (2) CAT6 drops at counter for IP phones (coordinate with millwork). Two (2) CAT3 drops at counter for analog phones (coordinate with millwork). RG6 cable outlet.*

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (c) 540 lux min*

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Remarks *Wood door-Kick plates are required on the push side , minimum 0.30 metres high. - doors to have locks with 'Privacy' function. -Painted doors and door frames to be G5 'Gloss Level' (semi-gloss).*

Department:	**15 - Childcare 04 - Preschool**		
Minimum Area:	**140.00**	*Ceiling Height:*	

Room Design Requirements

General Design Requirements

Activities and Functions
Outdoor play areas will be designed and built to create a natural environment utilizing a variety of textures and natural materials.

Playground equipment, such as climbers, will be placed at the edge of the play area to maximize the available outdoor open play space.

The outdoor play space will include a covered area and an uncovered area to accommodate the various outdoor activities. Between 1/3 and 1/2 of the outdoor area will be clear space for group activities and physical movement.

Since open areas can be taken over by riding toys unless other opportunities are provided, a paved path or route for wheeled toys will wind around other activity areas.

Children will be free to move from activity to activity outdoors as they are indoors without disrupting activities in activity zones.
Critical Adjacencies
The outdoor space will be acoustically buffered from traffic and parking and other disruptive noises, fumes and odours. Particular attention will be given to the building's mechanical equipment and vents. Locate the Childcare outdoor space to reduce noise from children disturbing adjacent uses.

Design Features
Covered Outdoor 33NSM

Open Outdoor 107NSM

The covered play area will be covered with glazed canopy- provide tempered laminated glazing.

The outdoor play area is to be divided into play zones, For information about play zones refer to Appendix 1E- Childcare Centre Requirements section 2.3.2-Activity Zones.

Room Finishes

Floor Finishes

Flooring Characteristics	*Do not use dark colours for impervious and play surfaces to reduce heat island effects and protect children from hot surfaces. Very light and reflective materials are not acceptable as they cause glare problems. All play and walking surfaces will be non-slip. Although natural plantings are preferred, artificial turf may be used for small areas of roof-top play areas providing that sand (rather than rubber chips) is used as the medium to hold it in place and that the turf specified is to the satisfaction of Community Care Facilities Licensing (CCFL). All safety information regarding the product is to be submitted to CCFL for their review. Playground fall protection surfaces: Acceptable products must meet CCFL requirements and include: - Engineered wood chip system complete with drainage, for example Fibar System 300. - Poured-in-place rubber system. - Or other pre-approved alternate.*

Ceiling Finishes

Ceiling Characteristics	*The covered play area will be covered with glazed canopy- provide tempered laminated glazing.*

Equipment and Accessories

Furniture, Fixtures and Equipment

Fences:

Minimum heights (all heights to be measured above any climbable permanent fixture located within 1.22 metres of the fence such as planters, benches, play equipment:

- 1.22 metres minimum typically.
- 1.82 metres where the grade outside the fence drops by at least 0.6 metres or a down slope of greater than 45°.
- 2.44 metres where the grade outside the fence drops by at least 3.05 metres, for example at a roof top. 1.82 metres with an extra 0.6 metres sloping 45°inwards is also acceptable.
- 1.82 metres at any pool, pond or body of water.

- Exterior glazed perimeter fencing will require visual markers to mitigate birds from colliding with glazing per City of Vancouver Bird Friendly Design Guidelines, as per Schedule 1- 6.7.1.1 (4).

For all the playground equipment requirements refer to Appendix 1E- Childcare Centre Requirements section 4.2.4.4 - Playground equipment requirements, 4.2.4.3 - Fall protection clearance requirements and depths guidelines

For all the playground leak detection system requirements refer to Appendix 1E- Childcare Centre Requirements section 4.2.6.2 - Roofs.

- Sand depth of sandboxes : minimum 457 millimetres in preschool outdoor play area

-Provide a covered weather-proof video/audio answer station which will have a keyed lock box.

-Provide removable solar shades for a portion of the outdoor play area, specifically over play elements such as the sandbox.

Plumbing Requirements

Water supply		Fixtures	
Cold Water (potable)	☑	Other	☑ *All drains to have removable and cleanable sediment traps. for requirement regarding sediment traps refer to Appendix 1E - 4.2.13.3 (1) and 4.2.13.3 (2). Hose bibs to be provided: Two in each outdoor play area, one at the building, one near sand box or children's urban agriculture plots. for requirements regarding hose bibs refer to Appendix 1E - 4.2.13.3 (5).*

Electrical Requirements

Power

General Power	For electrical requirements regarding access control refer to Appendix 1E - 4.2.16.2 (7). For requirements regarding local alarm and RTE buttons see Appendix 1E - 4.2.8.4 (9) and 4.2.8.4 (10).
Duplex Min. Qty	As per Appendix 1E - 4.2.14.1 (4) provide GFCI receptacles

Lighting

Luminaire Type

LED	☑

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3 (8)- illuminate entries, exits, high activity areas and security As per Appendix 1E - 4.2.14.3 (9) - HOA controls for servicing*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Doors to be fully glazed with tempered glass. - Swing doors or gates to have a hold open device such as a hook and eye, an “elephant’s foot” stop. or similar. -Sliding doors to play areas to have the ability to pin in place at open position to avoid injury from unsupervised sliding. -Kick plates are required on the push side of all doors with closers - kick plates minimum 0.30 metres high. - doors to have locks with 'classroom' function. - At all entrances from the outdoors provide walk-off mats (minimum size will allow for an adult to take two steps before stepping onto another flooring surface). - Deadbolt locks will be provided on both sides of low gates to exterior. Low gates between play areas, provide ball handsets only. - For requirements for Hardware and security, refer to Appendix 1E-Childcare Centre Requirements sections 4.2.8.4 - Hardware and 4.2.16.2 -Access Control, 4.2.16.3 - Intrusion Alarm and 4.2.16.4 - Enterphones .*

Department: **15 - Childcare 04 - Preschool**

Minimum Area: **3.70** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Critical Adjacencies
It will be adjacent to outdoor space of Preschool Group.

Equipment and Accessories

Furniture, Fixtures and Equipment

Exterior Playground Storage Shelving:

- Adjustable shelving, heavy duty, wire racks
- 4 rows of shelves, each shelf 0.45 metres-0.50 metres deep
- Lowest shelf - 0.76 metres from ground
- 0.50 metres gap between rows

Electrical Requirements

Power

Duplex Min. Qty	*1* As per Appendix 1E - 4.2.14.1 (4) provide GFCI receptacles

Lighting

Luminaire Type

LED	☑

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3 (8)- illuminate entries, exits, high activity areas and security As per Appendix 1E - 4.2.14.3 (9) - HOA controls for servicing As per Appendix 1E - 4.2.14.4 (6) (7) - occupancy sensors required*

Room Design - Door & Window Requirements

Doorsets

Remarks *-Kick plates are required at all storage room doors. Kick plates must be minimum 0.30 metres high. - doors to have locks with 'classroom' or 'storeroom' function. - Swing doors or gates to have a hold open device such as a hook and eye, an “elephant’s foot” stop. or similar. -Flush bolts at top + bottom on inactive leaf are required.*

Department: **15 - Childcare 05 - General**

Minimum Area: **57.40** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions
The Childcare Centre Entry at Level 1 includes area of

Entry vestibule;

Elevator; and

Dedicated stair from level 1 to Childcare Centre Entry at level 4

Equipment and Accessories

Furniture, Fixtures and Equipment

Mailbox:
- The Childcare Centre will have its own large mailbox.
- It will have its own civic address for Canada Post mail service and deliveries.
- The mailbox will be safe, weather-protected, lockable, and accessible from the interior.
- The mailbox may be at the Childcare Entrance or adjacent to the School's mailbox.

Notice boards:

- Provide a cork board with trim for parent notices- Minimum 0.91 metres W x 0.61 metres H to 1.52 metres W x 0.91 metres H. The larger the size that can be accommodated, the better.

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*
Remarks	*Individual room temperature control.*

Electrical Requirements

Power

General Power	
	For electrical requirements regarding access control refer to Appendix 1E - 4.2.16.2 (7). For requirements regarding local alarm and RTE buttons see Appendix 1E - 4.2.8.4 (9) and 4.2.8.4 (10).
Duplex Min. Qty	*2* As per Appendix 1E - 4.2.14.1

Lighting

Luminaire Type

LED	☑

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Doors to be fully glazed with tempered glass. - Swing doors or gates to have a hold open device such as a hook and eye, an “elephant’s foot” stop. or similar. -Kick plates are required on the push side of all doors with closers - kick plates - At all entrances from the outdoors provide walk-off mats (minimum size will allow for an adult to take two steps before stepping onto another flooring surface). - For requirements for main Childcare Centre entry doors at ground level, refer to Appendix 1E-Childcare Centre Requirements subsection 4.2.8.1. - For requirements for Hardware and security, refer to Appendix 1E-Childcare Centre Requirements sections 4.2.8.4 - Hardware and 4.2.16.2 -Access Control, 4.2.16.3 - Intrusion Alarm and 4.2.16.4 - Enterphones .*

Department: **15 - Childcare 05 - General**

Minimum Area: **24.30** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions
The Childcare Centre Entry at level 4 includes area of:

Entry vestibule

Equipment and Accessories

Furniture, Fixtures and Equipment

Notice boards:

Provide a cork board with trim for parent notices- Minimum 0.91 metres W x 0.61 metres H to 1.52 metres W x 0.91 metres H. The larger the size that can be accommodated, the better.

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*
Remarks	*Individual room temperature control.*

Electrical Requirements

Power

General Power	
	For electrical requirements regarding access control refer to Appendix 1E - 4.2.16.2 (7). For requirements regarding local alarm and RTE buttons see Appendix 1E - 4.2.8.4 (9) and 4.2.8.4 (10).
Duplex Min. Qty	*2* As per Appendix 1E - 4.2.14.1

Lighting

Luminaire Type

LED	☑

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Remarks - *Doors to be fully glazed with tempered glass. - Swing doors or gates to have a hold open device such as a hook and eye, an “elephant’s foot” stop. or similar. -Kick plates are required on the push side of all doors with closers - kick plates - At all entrances from the outdoors provide walk-off mats (minimum size will allow for an adult to take two steps before stepping onto another flooring surface). - For requirements for Hardware and security, refer to Appendix 1E-Childcare Centre Requirements sections 4.2.8.4 - Hardware and 4.2.16.2 -Access Control, 4.2.16.3 - Intrusion Alarm and 4.2.16.4 - Enterphones .*

Department: **15 - Childcare 05 - General**

Minimum Area: **9.50** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions

The Childcare Centre will provide storage space for parent-owned strollers, bicycle trailers and for car seats left for a return trip in another vehicle.

Critical Adjacencies

It will be near elevator (or near door to program).

Additional Remarks

Parents stroller storage is not required to be a conditioned space, but it will be covered and protected from inclement weather.

Equipment and Accessories

Furniture, Fixtures and Equipment

If enclosed, parent stroller storage will have shelving:

- Heavy duty adjustable shelves, wood / mdf
- Two rows of shelves
- Depth: 0.45 metres
- Lowest shelf - 1.00 metre high from ground
- 0.61 metres gap between rows

Electrical Requirements

Power

General Power

If enclosed provide:

Duplex Min. Qty *1*
As per Appendix 1E - 4.2.14.1

Lighting

Luminaire Type

LED ☑

Lighting Control

Remarks *As per Appendix 1E - 4.2.14.3 As per Appendix 1E - 4.2.14.4 (6) (7) - occupancy sensors required*

Room Design - Door & Window Requirements

Doorsets

Remarks *Wood door-Kick plates are required on the push side , minimum 0.30 metres high.*

Department: **15 - Childcare 05 - General**

Minimum Area: **9.50** *Ceiling Height:* **2440.00**

Room Design Requirements

General Design Requirements

Activities and Functions

A staff room will be provided if a single office is shared by two or more Groups.

Critical Adjacencies
Individual room temperature control.

Room Finishes

Floor Finishes

Flooring Characteristics	*- Carpet flooring - Base to be rubber, continuous throughout, and minimum 0.1 metres high. For general requirements for Floor finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.4*

Ceiling Finishes

Ceiling Characteristics	*- Gypsum Board- Painted (refer to paint section at 4.2.9.2) - Commercial quality suspended acoustic lay-in panel T-bar system. For general requirements for ceiling finishes refer to Appendix 1E - Childcare Centre Requirements section 4.2.9.3*

Wall Finishes

Wall Characteristics	*"Premium Grade" Painting - For general requirements for wall finishes refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*

Wall Protection

Types	*- For general requirements for wall protection refer to Appendix 1E -Childcare Centre Requirements section 4.2.9.2*
Heights	*0.8 metres above finished floor - Top edges and corners of wall protection material to be in turn protected (details to be provided).*

Equipment and Accessories

Furniture, Fixtures and Equipment

Notice board:

Cork Boards with Trim: 0.91 metres W x 0.61 metres H

Millwork:

- Half-sized lockers required for staff if not prefabricated. Provide minimum 6 per Group. 4 x 6 =24

- Coat closet for staff if staff lockers provided are for bags only.

Plumbing Requirements

Water supply

Hot Water	☑
Cold Water (potable)	☑

HVAC Requirements

HVAC

Minimum Temp (C)	*21*
Maximum Temp (C)	*24*

Electrical Requirements

Power

Duplex Min. Qty	*4* As per Appendix 1E - 4.2.14.1 and 4.2.14.1 (9)
Other Duplex Min. Qty	As per COV Childcare Technical Guidelines

Communication Requirements

Communication Systems

Telephone	☑ *CAT6 Drop Min Qty: 2*
Data	☑ *CAT6 Drop Min Qty: 4*
Remarks	*Two (2) CAT6 drops at counter for IP phones (coordinate with millwork). Two (2) CAT3 drops at counter for analog phones (coordinate with millwork). RG6 cable outlet.*

Lighting

Luminaire Type

LED	☑ *As per Appendix 1E - 4.2.14.3 (2) (c) 540 lux min*

Lighting Control

Remarks	*As per Appendix 1E - 4.2.14.3*

Room Design - Door & Window Requirements

Doorsets

Remarks *Wood door-Kick plates are required on the push side , minimum 0.30 metres high. - doors to have locks with 'Privacy' function.*

			Project Name:	Eric Hamber Secondary School Replacement Project - Childcare Centre						
Appendix 1E (B) - Childcare Centre Systems Scope Responsibility Matrix	New Facility Construction									
			Infrastructure (Passive)				Electronics (Active)			
	VSB-ICT Standard	**Notes:**	**Design**	**Procure**	**Install**	**Commission**	**Design**	**Procure**	**Install**	**Commission**
Division 27 - Communication										
Communications Site Services	**VSB Buildings Standards Manual Electrical Standard Edition 6 (Feb.18, 2019)**		**Design-Builder**	**Design-Builder**	**Design-Builder**	**Design-Builder**	**Owner**	**Owner**	**Owner**	**Owner**
Structured Cabling	**VSB Buildings Standards Manual Electrical Standard Edition 6 (Feb.18, 2019)**	**CommScope or approved equal**	**Design-Builder**	**Design-Builder**	**Design-Builder**	**Design-Builder**	**NA**	**NA**	**NA**	**NA**
Communications Backbone Cabling	**VSB Buildings Standards Manual Electrical Standard Edition 6 (Feb.18, 2019)**	**CommScope or approved equal**	**Design-Builder**	**Design-Builder**	**Design-Builder**	**Design-Builder**	**NA**	**NA**	**NA**	**NA**
Communications Horizontal Cabling	**VSB Buildings Standards Manual Electrical Standard Edition 6 (Feb.18, 2019)**	**CommScope or approved equal**	**Design-Builder**	**Design-Builder**	**Design-Builder**	**Design-Builder**	**NA**	**NA**	**NA**	**NA**
Data Communications Network Equipment	**VSB Buildings Standards Manual Electrical Standard Edition 6 (Feb.18, 2019)**		**Design-Builder/Owner**	**Design-Builder**	**Design-Builder**	**Design-Builder**	**Owner**	**Owner**	**Owner**	**Owner**
Data Communications Wifi System	**VSB Buildings Standards Manual Electrical Standard Edition 6 (Feb.18, 2019)**		**Design-Builder/Owner**	**Design-Builder**	**Design-Builder**	**Design-Builder**	**Owner**	**Owner**	**Owner**	**Owner**
VoIP Telephone System	**VSB Buildings Standards Manual Electrical Standard Edition 6 (Feb.18, 2019)**		**Design-Builder/Owner**	**Design-Builder**	**Design-Builder**	**Design-Builder**	**Design-Builder/Owner**	**Owner**	**Owner**	**Owner**
Audio-Video Systems	**VSB Buildings Standards Manual Electrical Standard Edition 6 (Feb.18, 2019)**	**Electronics (Active) includes LCD flat screens only.**	**Design-Builder/Owner**	**Design-Builder**	**Design-Builder**	**Design-Builder**	**Design-Builder/Owner**	**Owner**	**Owner**	**Owner**
Division 28 - Electronic Safety										
Intrusion Detection	**VSB Buildings Standards Manual Electrical Standard Edition 6 (Feb.18, 2019)**		**Design-Builder/Owner**	**Design-Builder**	**Design-Builder**	**Design-Builder**	**Design-Builder/Owner**	**Design-Builder**	**Design-Builder**	**Design-Builder**
Access Control	**VSB Buildings Standards Manual Electrical Standard Edition 6 (Feb.18, 2019)**	**Kantech**	**Design-Builder/Owner**	**Design-Builder**	**Design-Builder**	**Design-Builder**	**Design-Builder/Owner**	**Design-Builder**	**Design-Builder**	**Design-Builder**

			Project Name:	Eric Hamber Secondary School Replacement Project						
Appendix 1F - Systems Scope Responsibility Matrix Rev.01	New Facility Construction									
			Infrastructure (Passive)				Electronics (Active)			
	VSB-ICT Standard	Notes:	Design	Procure	Install	Commission	Design	Procure	Install	Commission
Division 27 - Communication										
Communications Site Services	VSB Buildings Standards Manual Electrical Standard Edition 6 (Feb.18, 2019)		Design-Builder	Design-Builder	Design-Builder	Design-Builder	Owner	Owner	Owner	Owner
Structured Cabling	VSB Buildings Standards Manual Electrical Standard Edition 6 (Feb.18, 2019)	CommScope	Design-Builder	Design-Builder	Design-Builder	Design-Builder	NA	NA	NA	NA
Communications Backbone Cabling	VSB Buildings Standards Manual Electrical Standard Edition 6 (Feb.18, 2019)	CommScope	Design-Builder	Design-Builder	Design-Builder	Design-Builder	NA	NA	NA	NA
Communications Horizontal Cabling	VSB Buildings Standards Manual Electrical Standard Edition 6 (Feb.18, 2019)	CommScope	Design-Builder	Design-Builder	Design-Builder	Design-Builder	NA	NA	NA	NA
Data Communications Network Equipment	VSB Buildings Standards Manual Electrical Standard Edition 6 (Feb.18, 2019)		Design-Builder/Owner	Design-Builder	Design-Builder	Design-Builder	Owner	Owner	Owner	Owner
Data Communications Wifi System	VSB Buildings Standards Manual Electrical Standard Edition 6 (Feb.18, 2019)	Aerohive	Design-Builder/Owner	Design-Builder	Design-Builder	Design-Builder	Owner	Owner	Owner	Owner
VoIP Telephone System	VSB Buildings Standards Manual Electrical Standard Edition 6 (Feb.18, 2019)		Design-Builder/Owner	Design-Builder	Design-Builder	Design-Builder	Design-Builder/Owner	Owner	Owner	Owner
Video Systems	VSB Buildings Standards Manual Electrical Standard Edition 6 (Feb.18, 2019)	Flat screen displays and projectors OSOI.	Design-Builder/Owner	Design-Builder	Design-Builder	Design-Builder	Design-Builder/Owner	Owner	Owner	Owner
Public Address and Audio Systems	VSB Buildings Standards Manual Electrical Standard Edition 6 (Feb.18, 2019)	Public Address and Audio System are integrated and function as a single complete system	Design-Builder	Design-Builder	Design-Builder	Design-Builder	Design-Builder	Design-Builder	Design-Builder	Design-Builder
Clock System	VSB Buildings Standards Manual Electrical Standard Edition 6 (Feb.18, 2019)	Valcom	Design-Builder	Design-Builder	Design-Builder	Design-Builder	Design-Builder	Design-Builder	Design-Builder	Design-Builder
Division 28 - Electronic Safety										
Intrusion Detection	VSB Buildings Standards Manual Electrical Standard Edition 6 (Feb.18, 2019)		Design-Builder/Owner	Design-Builder	Design-Builder	Design-Builder	Design-Builder/Owner	Owner	Owner	Owner

ERIC HAMBER SECONDARY SCHOOL

Appendix 1G - Food Services Equipment

OSOI = Owner Supply, Owner Install
OSCI = Owner Supply, Contractor/Design-Builder Install
CSCI = Contractor/Design-Builder Supply, Contractor/Design-Builder Install

EQUIPMENT LIST							ELECTRICAL SERVICES						PLUMBING SERVICES				GAS		EXHAUST		Sizing (mm)			Alternate Manuf.		
Area	Description	Supplier	Qty.	Manufacturer	Model	Specification	Load	120V	208V	Ph	Junc	Rec	Hot Water	Cold Water	Drain Size	Indirect To	Gas size	MBTU load	CFM est.	MUA est.	Length	Width / depth	Height	A	B	C
ADMIN.																										
	DESK	CSCI	1	Custom Fabricated		Stainless steel cabinet construction; Edges boxed; Back up 100mm and boxed; Solid bottom shelf, adjustable intermediate shelf; Swing doors with full length piano hinges, full width top edge handles, locks, magnetic catches; Stainless steel removable kickplates, adjustable bullet feet; 2 required drawers 6”/150mm deep with locks, removable plastic or stainless steel liners	CVO	X		1		X										min. 1070	750	1065			
	CUPBOARD	CSCI	1	Custom Fabricated		Stainless steel cabinet construction; Edges boxed; Solid bottom shelf, adjustable intermediate shelf; Swing doors with full length piano hinges, full width bottom edge handles, locks, magnetic catches															to suit desk length	380	610			
STORAGE																										
	MOP SINK CABINET	CSCI	1	Eagle Group/Metal Masters	F1916-VSCS-D series	Standard with Service faucet ; Hose and bracket; Stainless steel back with hold for service faucet; Door locks							13	13	38									Advance Tabco	Custom Fabricated	
	REACH-IN REFRIGERATOR	CSCI	3	True	T-49-HC	Standard with Bottom mounted refrigeration system Casters; locks on door side; Celsius reading digital thermometer; Door hinging as shown on drawings; Full size solid doors with locks; Epoxy coated wire shelves; One additional shelf per door; Cord and plug	5.4A	X		1		X												Beverage Air		
	REACH-IN FREEZER	CSCI	1	True	T-49F-HC	Standard with Bottom mounted refrigeration system Casters; locks on door side; Celsius reading digital thermometer; Door hinging as shown on drawings; Full size solid doors with locks; Epoxy coated wire shelves; One additional shelf per door; Cord and plug	9.6A	X		1		X												Beverage Air		
	REACH-IN FREEZER	CSCI	1	True	T-27F-HC	Standard with Bottom mounted refrigeration system Casters; locks on door side; Celsius reading digital thermometer; Door hinging as shown on drawings; Full size solid doors with locks; Epoxy coated wire shelves; One additional shelf per door; Cord and plug	5.5A	X		1		X												Beverage Air		
	SHELVING	CSCI	LOT	Metro	Super Erecta Shelf	Stationary units standard with epoxy coated finish; with 4 posts, 74P series per unit or common posts permitted where units are end to end, with floor plates; 5 adjustable shelves per unit															min. 915	min 457	1879	Nexel	Olympic	
	OVERSHELVES - High	CSCI	LOT	Custom Fabricated		Stainless steel construction; boxed edges; 14ga; stainless steel support rods; top full length wall bracket; fully welded underframe on shelf; heavy duty capacity mounted above shelving unit and reach-ins; length to suit wall; clear equipment below															to suit design	610				
PREP AREA																										
	HAND SINK	CSCI	1	Eagle Group/Metal Masters	HSA-10-FA-1P	Standard with foot operated and wall mounted; sealed to wall; Gooseneck faucet, p-trap and tail piece; basket drain; tempering valve							13	13	38									EFI	Polar	Custom Fabricated
	SOAP & TOWEL DISPENSER	CSCI	1	(refer to other section)																						

ERIC HAMBER SECONDARY SCHOOL

Appendix 1G - Food Services Equipment

OSOI = Owner Supply, Owner Install
OSCI = Owner Supply, Contractor/Design-Builder Install
CSCI = Contractor/Design-Builder Supply, Contractor/Design-Builder Install

EQUIPMENT LIST							ELECTRICAL SERVICES						PLUMBING SERVICES				GAS		EXHAUST		Sizing (mm)			Alternate Manuf.		
Area	Description	Supplier	Qty.	Manufacturer	Model	Specification	Load	120V	208V	Ph	Junc	Rec	Hot Water	Cold Water	Drain Size	Indirect To	Gas size	MBTU load	CFM est.	MUA est.	Length	Width / depth	Height	A	B	C
	WORK COUNTER	CSCI	1	Custom Fabricated		Stainless steel construction; boxed edges; backsplash up 200mm and splayed, closed ends and back; Bracing as required; Allow space for waste bin; 2 required sinks approximately 457 x 406 x 305 mm deep, all welded, all coved with lever wastes; solid bottom shelf; backsplash mounted swing faucet; 150mm deep drawer with removable liner and lock							13	13	2 X 50							to suit design (2600 min)	760	900			
	OVERSHELVES	CSCI	LOT	Custom Fabricated		Stainless steel construction; boxed edges; high and low units, full length of work counter below; table or wall mounted; clear equipment on counter below															to suit work counter	305				
	WORK COUNTER	CSCI	1	Custom Fabricated		Stainless steel cabinet construction; boxed edges; backsplash up 200mm and splayed, closed ends and back; solid bottom shelf; solid bottom shelf; adjustable intermediate shelf; stainless steel legs with removable kickbase on exposed sides; space for waste bin; 2 required drawers 150mm deep wtih locks and removable liners; 15A outlet on counter															to suit design (2800 min)	760	900			
	OVERSHELVES	CSCI	LOT	Custom Fabricated		Stainless steel construction; boxed edges; high and low units, full length of work counter below; table mounted; clear equipment on counter below															to suit work counter	305				
	WORK COUNTER	CSCI	1	Custom Fabricated		Stainless steel cabinet construction; boxed edges; backsplash up 200mm and splayed, closed ends and back; solid bottom shelf; solid bottom shelf; adjustable intermediate shelf; stainless steel legs with removable kickbase on exposed sides; space for waste bin; 2 required drawers 150mm deep wtih locks and removable liners; 15A outlet on counter															to suit design (2800 min)	760	900			
	OVERSHELVES	CSCI	LOT	Custom Fabricated		Stainless steel construction; boxed edges; high and low units, full length of work counter below; table mounted; clear equipment on counter below															to suit work counter	305				
COOKING AREA																										

ERIC HAMBER SECONDARY SCHOOL

Appendix 1G - Food Services Equipment

OSOI = Owner Supply, Owner Install
OSCI = Owner Supply, Contractor/Design-Builder Install
CSCI = Contractor/Design-Builder Supply, Contractor/Design-Builder Install

EQUIPMENT LIST							ELECTRICAL SERVICES						PLUMBING SERVICES				GAS		EXHAUST		Sizing (mm)			Alternate Manuf.		
Area	Description	Supplier	Qty.	Manufacturer	Model	Specification	Load	120V	208V	Ph	Junc	Rec	Hot Water	Cold Water	Drain Size	Indirect To	Gas size	MBTU load	CFM est.	MUA est.	Length	Width / depth	Height	A	B	C
	SERVICE WALL or WALL FLASHING	CSCI	1	Custom Fabricated		Service Wall: Stainless steel construction; Sized to suit application, access to service lines for adjacent equipment; service lines and connections concealed in wall, access panels as required for access to services; floor to ceiling as required; angle iron frame; services secured to frame; no exposed service lines; Removable panels to be removable without the use of tools where easily accessible; All shutoff valves to be concealed in chases and easily accessible, label valve locations; Outlets as required Large chase to house shut-offs, filters, fire suppression system; swing doors with full length piano hinges Wall Flashing: Stainless steel construction; Sized to suit application; insulated, vertical grain; Seal all joints; Adhere to wall with full bed of heat resistant mastic; Utilize stainless steel vertical divider strips where sheets meet; cutouts/penetrations/stainless steel cover plates through flashing as required for services; stainless steel cover over top of exposed service lines					X	X		X							to suit hood	250 wall; 25 flashing	Service wall: floor to ceiling or 1220 to sill Flashing: underside of hood to wall base			
	EXHAUST HOOD(S)	CSCI	LOT	Spring Air	FN-B-MB series	Unit(s) to be integral with Mechanically designed HVAC system Box or Taper type; wall or island type high efficiency low air volume exhaust hood with integral make-up air plenum and demand control system/zone flow, control panels, etc. Sized to suit equipment below (ensure minimum 200mm overhang on all exposed sides); ULC listed; Fabricated and installed to meet all governing codes and in compliance with latest ULC & NFPA-96 requirements and authority having jurisdiction; Stainless steel liquid tight construction; Easy access to all components; Fire dampers if required, Fire dampers activated by thermostatic or mechanical detection, Mechanical gas valve(s); Interconnection to building automation and/or fire systems; Hanging brackets – full length and continuous – seismically restrained; Closure panels to finished ceiling; LED lights; stainless steel filters	as req'd	X	X	1	X								2100 or to suit design	1470 or to suit design	to suit design	1320 capture depth	to suit design	Halton	Quest	

ERIC HAMBER SECONDARY SCHOOL

Appendix 1G - Food Services Equipment

OSOI = Owner Supply, Owner Install
OSCI = Owner Supply, Contractor/Design-Builder Install
CSCI = Contractor/Design-Builder Supply, Contractor/Design-Builder Install

EQUIPMENT LIST							ELECTRICAL SERVICES						PLUMBING SERVICES				GAS		EXHAUST		Sizing (mm)			Alternate Manuf.		
Area	Description	Supplier	Qty.	Manufacturer	Model	Specification	Load	120V	208V	Ph	Junc	Rec	Hot Water	Cold Water	Drain Size	Indirect To	Gas size	MBTU load	CFM est.	MUA est.	Length	Width / depth	Height	A	B	C
	FIRE SUPPRESSION SYSTEM	CSCI	1	Rangeguard	Wet Chemical	Wet chemical; Fabricated and installed to meet all governing codes and in compliance with latest regulations and authority having jurisdiction Standard with Capacity for coverage of all cooking equipment under hoods, plenum and ducts as required by code and authority having jurisdiction; Provide shut-off valves and solenoids, coordinate installation of same with applicable sub-trade; remote fire pull; Conceal all piping where possible, exposed piping to be chrome plated, exposed horizontal piping not acceptable; Activation of system by globe fusible links, mechanical detection; Integral with Exhaust Hood(s); 1 required hand held 'K' class fire extinguisher; provide all applicable certifications, letters of assurance, letters of compliance and other documents/drawings as requested by AHJ (Authority Having Jurisdiction) for a complete certified operational system; coordinate operation of the system as it relates to the building systems; and requirements of the AHJ; Line work to remote pull to be concealed in wall	6A	X		1	X													Ansul	Kidde	
	COMBI OVEN with Stand	CSCI	1	Rational	SCC-62E	Standard unit with stand with casters with locks; cook and hold feature; slow cooking capability; capacity for 6 full size sheet pans or 12 full size 63mm deep insert pans minimum; integral cleaning system with one set of cleaning supplies; wire rack; filter system; energy saving system connection; one full day on-site training	22.1KW		X	3	X			2 X 19	50	HUB								Convotherm	Lainox	Alto Shaam
	RANGE with Oven	CSCI	1	Garland	GFE60-4G36RR	Standard with flame failure protection; 4 burners, 915mm griddle; standard ovens; heavy-duty casters, front casters c/w brakes; standard backguard	1A	X		1		X					25	234						US Range	Quest	Montague
DISH/POT WASH																										
	HAND SINK	CSCI	1	Eagle Group/Metal Masters	HSA-10-FA-1P	Standard with foot operated and wall mounted; sealed to wall; Gooseneck faucet, p-trap and tail piece; basket drain; tempering valve							13	13	38									EFI	Polar	Custom Fabricated
	SOAP & TOWEL DISPENSER	CSCI	1	(refer to other section)																						
	SINK UNIT	CSCI	1	Custom Fabricated		Stainless steel construction; edges up and rolled; backsplash up 250mm and splayed to wall, closed ends; space for waste bin; bracing as required; drainboards slope to sinks; 3 sinks approximately 725 x 515 x 355mm deep or equivalent - to accommodate full size sheet pan; all welded, rolled front and back; flush slide rails over sinks; full removable covers each sink; 1 required backsplash mounted faucet with 19mm dia swing spouts between sink; lever wastes; unit to accommodate Under-counter Dishwasher at one end							1 X 19	1 X 19	3 X 50						to suit design (3200 min)	to suit design (750 min)	to suit design (915 min)			

ERIC HAMBER SECONDARY SCHOOL

Appendix 1G - Food Services Equipment

OSOI = Owner Supply, Owner Install
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CSCI = Contractor/Design-Builder Supply, Contractor/Design-Builder Install

EQUIPMENT LIST							ELECTRICAL SERVICES						PLUMBING SERVICES				GAS		EXHAUST		Sizing (mm)			Alternate Manuf.		
Area	Description	Supplier	Qty.	Manufacturer	Model	Specification	Load	120V	208V	Ph	Junc	Rec	Hot Water	Cold Water	Drain Size	Indirect To	Gas size	MBTU load	CFM est.	MUA est.	Length	Width / depth	Height	A	B	C
	PRE-RINSE UNIT	CSCI	1	Fisher	34398	Standard with 1220mm hose length; wall bracket; vacuum breaker; in-line dual check valve; wrist style handles; Add-on faucet – verify swing spout length with sink unit; Ultra low-flow spray valve with designed flow restrictor to meet Energy Star							13	13										T&S	Encore	
	UNDER-COUNTER DISHWASHER with Booster	CSCI	1	Champion Industries	401HT-Plus	Standard high temperature operation unit; with Integral 9kw High Speed booster (38C/100F temperature rise capacity); Standard racks – one flat, one peg; Unit to fit under sink unit	29A		X	3	X			19	50									Hobart	Jackson	
	OVERSHELF	CSCI	2	Custom Fabricated		Stainless steel construction; boxed edges; mounted 750mm clear of counter edge below; table or wall mounted															915 min.	305				
	CORNER GUARDS	CSCI	LOT	Custom Fabricated		Stainless steel construction; wall corner mounted from top of wall base																50/50	1220 min.			
SERVING AREA																										
	PASS-THRU DISPLAY REFRIGERATOR	CSCI	1	True	GDM-47RL-LD	Standard with Black finish – interior and exterior; Black shelving; 2 additional shelves; Sliding glass doors on customer side with lock; Rear swing doors with locks on staff side; Standard LED interior lighting; Self-contained, condensate evaporator; Low profile casters with locks; Cord and plug	8.8A		X	1		X												Structural Concepts		
	SERVICE COUNTER	CSCI	1	Custom Fabricated		Stainless steel and millwork (customer side) cabinet construction; stainless steel top with boxed edges; stainless steel removable kickplates; openings and recesses as required for equipment; Allow space and air circulation for cold wells unit; air grill finish to be determined, allow for electroplated finish colour to be determined; solid bottom shelves with access panels as required to access drain & service lines; solid adjustable intermediate shelves; integral tray rail, stainless steel with 'v' raised sliders, rolled front edging, concealed mounting brackets, integral utility chase, with removable access panels as required for access to service line runs, millwork/plastic laminate finish on customer side; deck mounted fill faucets Fisher model 3011 or equivalent – hot water; 1 required 150mm deep drawer with lock and removable liner at cash station; outlets as required; provide one additional 15A outlet and one additional 20A outlet in counter; cut-outs with grommets as required for counter mounted equipment		X		1	X		2 X 13								to suit design	1170	900 working height			
	HOTWELL UNIT (5 WELL)	CSCI	1	Hatco	HWBI-5DM	Standard 5 well unit, with drain valve extension kit; drain screens; individual thermostatic controls	20.1A		X	3	X				25	HUB								Wells	Vollrath	Delfield
	COLD WELL UNIT	CSCI	1	Hatco	CWB-3	Standard unit with capacity for 3 full size insert pans, with drain valve extension kit;	804W	X		1		X			25	HUB								Wells	Vollrath	Delfield

ERIC HAMBER SECONDARY SCHOOL

Appendix 1G - Food Services Equipment

OSOI = Owner Supply, Owner Install
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CSCI = Contractor/Design-Builder Supply, Contractor/Design-Builder Install

EQUIPMENT LIST							ELECTRICAL SERVICES						PLUMBING SERVICES				GAS		EXHAUST		Sizing (mm)			Alternate Manuf.		
Area	Description	Supplier	Qty.	Manufacturer	Model	Specification	Load	120V	208V	Ph	Junc	Rec	Hot Water	Cold Water	Drain Size	Indirect To	Gas size	MBTU load	CFM est.	MUA est.	Length	Width / depth	Height	A	B	C
	SNEEZEGUARD with OVERSHELF	CSCI	1	Custom Fabricated		Stainless steel construction with verticla front, stainless steel top sized to accommodate heat lamp, tempered glass front and sides; sneezeguard edge to be beveled with chrome/stainless steel acorn anchoring nuts, 25mm square stainless steel support tubing (conceal heat lamp wiring); fixed front at hot wells, adjustable front at cold well; coordinate installation with security shutter															to suit hot well unit	305 top	435			
	HEAT LAMP	CSCI	1	Hatco	GRAH-60	Standard with infinite control	1.4KW	X		1	X													Merco	Gann	
	CONDIMENT STATION - Mobile	CSCI	1	(refer to other section)																						
	DETERGENT SYSTEM	OSOI	1				1A		X	1	X			13												
	COFFEE MAKER with Airpots	OSOI	1				26A		X	1	X			13												
	POS UNIT	OSOI	1				4A	X		1		X														
	WASTE BIN	OSOI	LOT																							

BUILDING STANDARDS
MECHANICAL

EDITED FOR ERIC HAMBER SECONDARY SCHOOL DESIGN BUILD PROJECT

FOR RELEASE – MAY 8, 2019

Second edit November 1, 2019

TABLE OF CONTENTS

SECTION	DESCRIPTION
25 05 00	Common Work for DDC Systems
25 05 60	DDC – Field Installation
25 08 00	DDC – Commissioning
25 10 02	DDC– Operators work Station
25 30 02	DDC – Field Devices
25 90 01	DDC – Sequence of Operation

1 GENERAL

1. This document contains Vancouver School Board's Building Standards for Mechanical Design that are required in addition to good institutional construction practices and Vancouver Building By-law requirements.

2. No part of this Building Standard relieves the Mechanical Consultant of his or her responsibility to produce complete and comprehensive design documents and deliver a complete and functional mechanical system.

3. The mechanical consultant must ensure that all relevant information contained in this standard is incorporated into the project design documents and must seek clarification for items when required on not in compliance.

4. Although the information contained in this document is organized using the MasterFormat® and SectionFormat® systems it is not a complete specification. The information contained herein is meant to be used to guide and supplement the Consultant's own documents and is not to be used as a standalone specification.

~~5.~~ ~~Prior to the project proceeding to permit or tender the Mechanical Consultant must complete the "Assurance of Compliance with VSB Mechanical Standard" form in the subsequent section and submit this to the VSB Project Manager.~~

ASSURANCE OF COMPLIANCE WITH VSB MECHANICAL BUILDING STANDARDS

To: Manager of Facility Development
Vancouver School Board

From: _____
(Name of Mechanical Engineer of Record)

_____
(Name of Mechanical Consulting Engineering Firm)

_____
(Address of firm)

_____
(Phone # of firm/Cell # of Engineer of Record)

Re: _____
(Project Name/phase)

_____
(Project Address)

I, _____ *hereby give assurance that all design documents produced by my firm are in compliance with the VSB Mechanical Building Standards as per the edition number and date as indicated in the header of this letter.*

_____ _____
(Signature) (Date)

NOTE: Prior to the start of any design activity, the Mechanical Consultant must designate a staff member to act as the Mechanical Engineer of Record for the project. The Engineer or Record must complete this letter template and submit it to the VBE Project Manager prior to building permit and/or tender of the project.

EDITION HISTORY

EDITION	RELEASE DATE	VBE COORDINATOR	NOTE
1.1	2016 04 18	NOEL MCNALLY	FOR INTERNAL REVIEW
1.2	2016 05 30	NOEL MCNALLY	FOR INTERNAL REVIEW
1.3	2016 06 30	NOEL MCNALLY	FOR INTERNAL REVIEW
1.4	2016 09 30	NOEL MCNALLY	FOR INTERNAL REVIEW
1.5	2016 12 30	NOEL MCNALLY	FOR INTERNAL REVIEW
1.6	2017 05 23	NOEL MCNALLY	FOR INTERNAL REVIEW
1.7	2017 06 21	NOEL MCNALLY	FOR RELEASE
2.1	2018 11 12	RON MACDONALD	FOR INTERNAL REVIEW
2.2	2018 11 21	RON MACDONALD	FINAL DRAFT
2.3	2019 05 08	RON MACDONALD	FOR RELEASE

1 SCOPE OF WORK

.1 Provide new, complete, operational, and commissioned fire protection system(s) as described herein, indicated on the drawings and in full conformance with applicable codes, standards, and standards.

.2 Connect to existing sprinkler systems in existing buildings and upgrade existing systems where not compliant with current codes and standards.

2 DESIGN REQUIREMENTS

.1 Sprinkler systems shall be designed in accordance with NFPA 13 for wet and dry sprinkler systems to latest NFPA edition and appropriate hazard classification.

.2 Sprinkler valve stations shall be located in mechanical rooms and/or approved locations within the building only and be fully accessible without the use of a ladder.

.3 Sprinkler flow switches and isolation valves located in stair shafts and ceiling spaces will not be permitted.

.4 All low point drains in sprinkler systems shall be avoided where possible and all sprinkler piping shall slope back to the main sprinkler stations.

.5 When low point drains for sprinkler systems are required, they shall be identified on as-built drawings, be accessible and provided with ceiling location identification. The low point drain valves shall also be brought down to an accessible level for ease of maintenance and connection.

.6 The location of all exposed piping shall be reviewed and approved by the mechanical consultant and architect for the project prior to installation.

.7 Access to sprinkler system Siamese ball drip valve for maintenance shall be provided.

.8 Coordinate drain locations for the sprinkler system and ensure that the sprinkler main drain is provided with a 6" sanitary line and trap.

.9 Schedule 7 thin wall sprinkler piping is not permitted. Refer to piping material section for permitted sprinkler piping material and fittings.

.10 For new building construction coordinate with division 26 (electrical) and ensure that all devices including tamper switches, pressure switches and flow switches are addressable through the fire alarm system.

.11 ~~Consider the~~ use concealed type sprinkler heads in all storage rooms, washrooms, changing rooms, corridors and other areas which are not directly supervised by school staff.

.12 Provide protective guards for all sprinkler heads located at exterior of the building and in areas subject to damage such as; gymnasiums, multi-purpose, storage rooms and high activity rooms or low ceiling areas of the school.

.13 All sprinkler system test and drain assemblies shall be located in mechanical rooms where possible and hard piped to drain.

3 APPROVED EQUAL MANUFACTURERS

Air Compressor	Devilbis, General
Fire Protection - Cabinets & Extinguishers	National, Viking, General
Fire Protection - Extinguishers	Kiddie, National

Pipe Fittings and Flanges	Crane, Grinnell, Jenkins, Victaulic
Pipe Couplings - Grooved	Victaulic, Grinnell
Pipe Fittings and Flanges	Mason, Flexonics, Hyspan, Goodall, Victaulic, Proco
Pipe Supports and Hangers	Crane, Unistrut, Myatt, Grinnell, Sarco, Hunt, Taylor
Pressure Gauges	Weiss, Ashcroft, Trerice, Marsh, Winter, Miljoco
Sprinkler Heads	Grinnell, Central, Star
Valves (Ball, Gate, Globe, Check)	Red & White/Toyo, Grinnell, Watts, Kitz, Crane, Milwaukee, Conbraco
Valves (Butterfly)	Red & White/Toyo, Grinnell, Kitz, Crane, Milwaukee, Keystone, DeZurik, Lukenheimer
Valves (Dry Sprinkler Valves)	Tyco, Victaulic

4 SUBMITTAL REQUIREMENTS

.1 Shop Drawings

.1 Provide PDF copies of shop drawings for the hydraulic sprinkler design.

.2 Submit shop drawings for the following fire protection equipment and ensure that this information is included in the final maintenance manuals:

.1 Fire Protection Sprinklers and Devices
.2 Backflow preventers
.3 Sprinkler layout drawings c/w hydraulic calculations
.4 Inspectors test locations

.2 Operating and Maintenance Manuals

.1 Documentation will be submitted in both paper and electronic file format. The electronic file format shall be in ADOBE PDF format unless otherwise specified.

.2 The Operating and Maintenance manuals are to be submitted hard – post/hot stamped expandable binders with 25% spare capacity for future information. Model VBB-3-5 produced by Vancouver Book Binding (Black).

.3 The following information must be printed in gold foil on the front cover and spline:

[SCHOOL NAME]
[SCHOOL ADDRESS]
MECHANICAL OPERATION & MAINTENANCE MANUAL
VOLUME X OF X
[YEAR]

ARCHITECT:	[INSERT NAME]
MECHANICAL ENGINEER:	[INSERT NAME]
GENERAL CONTRACTOR:	[INSERT NAME]
MECHANICAL CONTRACTOR:	[INSERT NAME]

.4 The PDF format and 2 hard copy manuals shall include the following information:

.1 TWO clean, paper copies and a PDF version of:

.1 "As-Built" shop drawings

.2 Manufacturer's equipment start-up reports for:

.1 Dry Pipe Fire Sprinkler System

.2 Wet Pipe Fire Sprinkler System

.3 Hydrostatic tests performed on:

.1 Dry Pipe Fire Sprinkler System Piping

.2 Wet Pipe Fire Sprinkler System Piping

.4 Inspection certificates for:

.1 Fire Protection Sprinklers and Devices

.2 Material and test certificate

.5 Sprinkler Engineers Schedule B1, B2 and Schedule C letters of assurance.

.6 Certificate of Guarantee

.2 PART ONE - DESCRIPTION OF SYSTEMS

.1 Title page indicating project title and the names, addresses, telephone and fax numbers of the Owner, Mechanical Engineer, General Contractor, Mechanical Contractor and the agency preparing the manuals.

.2 Description of systems, including description of system controls, and components comprising the system.

.3 Describe systems operation and sequence of control operation, including start-up, shutdown, and intended response of system

.4 Operation instruction for systems and component.

.5 Description of actions to be taken in event of equipment failure.

.6 Valves schedule and flow diagram.

.3 PART TWO – MAINTENANCE AND TEST INFORMATION

.1 A list of equipment manufacturers, suppliers, and sub-contractors used. Contact information for equipment manufacturers, suppliers, and sub-contractors.

.2 Equipment performance data to include:

.1 Equipment manufacturer's performance datasheets with point of operation as left after commissioning is complete.

.2 Equipment performance verification test results.

.3 Special performance data as specified.

.3 Equipment Maintenance and Test Information. This information shall include:

.1 Maintenance procedures

.2 Maintenance schedule

.3 Lubrication requirements

.4 Copies of hydrostatic testing performed on:

.1 Fire Protection Sprinkler Piping

.5 Copies of Inspection Certificates for

.1 Fire Protection Sprinklers, Standpipe Hose Systems and Devices

.6 Certificate of Guarantee

.4 PART THREE – SHOP DRAWINGS

.1 Include a copy of all Shop Drawings. Version included is to be the version given “Reviewed” status by the Consultant.

.3 ~~**“RECORD” Drawings**~~

~~.1 The Mechanical Consultant must produce "Record" drawings at the end of the project. The cost of producing these drawings must be included in the Mechanical Consultant's fee or a cash allowance in the contract. (It is NOT acceptable for the Mechanical Contractor to produce these drawings.)~~

~~.2 Identify each drawing in lower right hand corner in letters at least 12 mm high as follows: - "RECORD DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (Date).~~

~~.3 The Mechanical Consultant must provide the Prime Consultant with [2] hardcopy sets as well as a CD-DVD containing electronic drawing files in both DWG and PDF format. (The Prime Consultant must forward this material to the VBE within 60 days of substantial completion.)~~

5 INITIAL EQUIPMENT START-UP

.1 The sprinkler system installation shall be checked to ensure that it meets the hydraulic design drawings and NFPA 13 requirements.

.2 All dry systems shall be completely drained of water at all branch piping locations. Removal of sprinkler heads may be required to completely evacuate the piping system.

6 IDENTIFICATION

.1 Sprinkler zone piping to be identified by zone label sticker adjacent to the flow switch and/or test and drain assembly.

.2 Where required, the entire length of sprinkler piping shall be painted red for identification.

7 INSTRUCTION OF OWNER’S OPERATING STAFF

.1 The Commissioning Agency retained for the project will coordinate and run a training and instruction session for facility operating and maintenance personnel.

.2 The sprinkler contractor shall fully demonstrate the sprinkler system to the VSB and identify the location of all system components.

.3 The Contractor shall obtain a written release from the VSB stating:

.1 The VSB has received satisfactory instruction in operation and maintenance of all mechanical equipment and systems.

.2 The VSB has reviewed operation and maintenance manuals.

.3 Specified spare parts of components, keys, removable handles, and the like have been turned over to the VSB.

END OF SECTION 21 05 00

1 SCOPE OF WORK

.1 The wet and dry pipe sprinkler system shall include but not be limited to a complete automatic system complete with all valves, sprinkler stations, flow switches, tamper switches, pressure switches, piping, approved backflow prevention device, coring, sleeves, fittings, alarms, Siamese connections, compressors, controls, sprinkler heads, sway bracing, hangers, test valve cabinets, and supports.

2 DESIGN REQUIREMENTS

.1 Sprinkler system piping shall be installed above ceilings and concealed whenever possible. Any exposed piping locations shall be reviewed by the architect and consultant for approval prior to installation.

.2 Any exposed sprinkler piping shall be primed and painted over its entire length.

.3 Exposed sprinkler piping which is 2"diameter or greater shall be welded and piping shall be degreased for external priming and painting.

3 SPRINKLER SYSTEM HYDRAULIC DESIGN

.1 The sprinkler system is to be hydraulically designed by a registered professional engineer and should include locations of incoming water assembly, fire protection backflow device, alarm valves and zone flow and test drain locations, and standpipe risers. All components are to be coordinated with other building systems.

.2 The system is to be designed to the most current NFPA 13 standards.

.3 When systems are sized, all head and pipe locations must be coordinated with (existing and/or new) site conditions including architectural, mechanical, structural, and electrical.

.4 Shop Drawings are to be submitted and subject to the Consultant's review prior to obtaining a sprinkler permit.

4 QUALITY ASSURANCE

.1 A qualified Contractor licensed and regularly engaged in installation of automatic fire sprinkler equipment shall install the wet and dry pipe sprinkler system and equipment.

.2 Equipment and installation shall meet the requirements of NFPA No. 13, IAO, FM and ULC where required. Provide seismic restraints, in accordance with NFPA 13.

.3 Supply grooved joint couplings, fittings, valves, grooving tools and specialties from a single manufacturer. Use date stamped castings for coupling housings, fittings, valve bodies, for quality assurance and traceability.

5 PRODUCTS

.1 DESIGN REQUIREMENTS

.1 Design automatic wet and dry pipe fire suppression sprinkler systems in accordance with required and advisory provisions of NFPA 13, by hydraulic calculations for uniform distribution of water over design area.

.2 Locate sprinkler heads in consistent pattern with ceiling grid, lights, and air supply diffusers.

.3 Devices and equipment for fire protection service: ULC approved for use in wet pipe sprinkler systems.

.4 Design systems for earthquake protection for buildings in seismic zones.

.2 PIPE, FITTINGS, AND VALVES

.1 Pipe:

.1 All fire protection sprinkler piping and components shall be ULC approved and listed for fire service use by NFPA-13.

.2 "Light wall" pipe for welded or roll grooved fittings shall be schedule 10 or greater. All other piping shall be schedule 40.

.2 Fittings:

.1 Fittings: ULC approved for use in wet pipe sprinkler systems.

.2 Grooved end fittings shall be of one manufacturer.

.3 Valves:

.1 All valves on fire protection systems shall be UL or ULC approved. F.M. where required.

.2 Provide approved automatic sprinkler valve stations as required, c/w flow detectors, pressure or flow switches, outside alarm bell, excess pressure pump and air compressor.

.3 Wet pipe valve shall incorporate all component requirements of NFPA, and all other governing authorities.

.4 Provide and install wet sprinkler zone stations as shown on the drawings.

.5 An approved check valve shall be installed in each fire department connection, located as near as practicable to the point where it joins the system or as shown on the drawings.

.4 Pipe hangers:

.1 ULC listed for fire protection services in accordance with NFPA.

.3 DRY PIPE VALVE

.1 ULC listed, cast or ductile iron, flanged, or grooved end type, sized to suit water main.

.2 Provide valve complete with internal components that are replaceable without removing valve from installed position.

.4 SPRINKLER HEADS

.1 All sprinkler heads serving areas designated as Light Hazard by NFPA-13 shall be quick response type.

.2 In areas subject to freezing use Central Model H-1, non-freeze sidewall heads or Central Model A-1 dry pendant heads connected to wet sprinkler systems.

.3 Provide corrosion-resistant sprinkler heads and sprinkler head guards in accordance with NFPA 13.

.4 Provide all sprinkler heads as indicated on the approved sprinkler drawings.

.5 WATER MOTOR ALARMS

.1 Provide water gong alarms approved weatherproof and guarded type, to sound locally on flow of water in each corresponding sprinkler system.

.2 Provide separate drain piping directly to exterior of building. Piping to and from water gong to be galvanized.

.6 SUPERVISORY SWITCHES

.1 Mechanically attached to valve body, with normally open and normally closed contacts and supervisory capability with connection to building fire alarm system.

.2 Pressure or flow switches connected to fire alarm system and must be addressable type.

.7 FIRE DEPARTMENT CONNECTION (SIAMESE)

.1 Provide wall mounted or free standing Siamese connections approximately 1.2 m above finish grade, To NFPA 13 and ULC S543 listed, Siamese type location as approved by fire department.

.8 PRESSURE GAUGES

.1 Provide at the main valve assembly, each alarm valve station, and the top of all standpipe risers.

.9 BURIED WATER PIPING SYSTEM

.1 Outside water service piping shall be PVC C-900 piping and installed to manufacturer recommendations with rodding and thrust blocks.

.10 PIPE SLEEVES

.1 Provide pipe sleeves where piping passes through walls, floors, and roofs.

.2 Extend sleeves 50-mm (2-inches) above floor slabs in all areas.

.3 Extend sleeves through outside walls 25-mm (1-inch) beyond exterior face.

.4 Install chrome plated escutcheon plates on exposed piping passing through walls, floors, and ceilings in finished areas.

.11 INSPECTORS TEST CONNECTION

.1 Locate inspector's test connection at hydraulically most remote part of each system, provide test connections approximately 3 m above floor for each sprinkler system or portion of each sprinkler system equipped with alarm device.

.2 Provide test connection piping to location where discharge will be readily visible and where water may be discharged without property damage.

.13 Portable Fire Extinguishers

.1 Shall be type ABC pressurized with hose and shut off nozzle or integral shut off nozzle and mounting brackets, 4.5 kg capacity located within fire hose cabinets.

.2 Provide fully recessed cabinet for all fire extinguishers.

.14 SPARE PARTS CABINET

.1 Provide metal cabinet with extra sprinkler heads and sprinkler head wrench adjacent to each alarm valve. Number and types of extra sprinkler heads as specified in NFPA 13.

2 EXECUTION

.1 INSTALLATION

.1 Install, inspect and test to acceptance in accordance with NFPA 13 and NFPA 25.

.2 PIPE INSTALLATION

.1 Install piping straight and true to bear evenly on hangers and supports. Do not hang piping from plaster ceilings. Hangers and seismic restraint to be installed as per NFPA 13 requirements

.3 FIELD QUALITY CONTROL

.1 This Contractor shall perform all tests required by NFPA 13. When the authority having jurisdiction desires to be present during the conduct of tests, the Contractor shall give the authority having jurisdiction advance notification of time tests to be performed.

.2 Preliminary Tests:

.1 Hydrostatically test each system at 200 psig for a 2-hour period with no leakage or reduction in pressure.

.2 Test water flow alarms by flowing water through inspector's test connection. When tests have been completed and corrections made, submit signed and dated certificate in accordance with NFPA 13.

.3 Contractor's Certificate - NFPA Testing Contractor's Certificate is to be completed and forwarded to the authority having jurisdiction and the Consultant as evidence that the necessary tests and materials have been provided. ***It is stressed that all sections of the certificate are to be completed.***

END OF SECTION 21 13 00

This document contains Vancouver School Board standards that are required in addition to good institutional construction practices and Vancouver Building By-law requirements. Although the information contained in this document is organized using the MasterFormat® and SectionFormat® systems it is not a complete specification. The information contained herein is meant to be used to guide and supplement the Consultant's own documents and is not to be used as a standalone specification.

Sustainability Goals

1. *The VSB has an active resource conservation initiative. Plumbing systems shall be designed to minimize water consumption.*
2. *The Contractor shall be aware that all LEED prerequisite requirements shall be met with no exceptions and that no changes affecting the LEED certification will be allowed.*

1 SCOPE OF WORK

.1 Provide new, complete, operational, and commissioned plumbing system(s) as described herein, indicated on the drawings and in full conformance with applicable codes, standards, and ordinances.

2 REFERENCED CODES AND STANDARDS AND REGULATORY BODIES

.1 Worksafe BC Occupational Health and Safety Regulation
.2 Vancouver Building Plumbing Bylaw
.3 CAN/ULC/CSA

3 DESIGN REQUIREMENTS

.1 *All plumbing fixtures, drains and system components shall be of **institutional** quality and to VSB standards.*

.2 *Provide domestic hot and cold water isolation valves on each group of plumbing fixtures. All valves to be accessible and location identified on the ceiling with data dot.*

.3 *Provide domestic hot water recirculation to all low flow mixing valves to within 6 inches of the mixing valve. Heat tracing of the domestic hot water piping is not acceptable.*

.4 *All domestic hot, cold and recirculation piping to be insulated over the entire length in ceiling spaces and walls.*

.5 *All water closets to use lead/brass flanges and no offset flanges will be permitted. ABS flanges will not be permitted.*

.6 *Provide adequate floor drains in all mechanical rooms at all tank, equipment overflow, pressure relief, and automatic air vent locations. Floors of mechanical rooms shall also be sloped to drain.*

.7 *Any mechanical rooms shall be provided with water proof membrane and curbed at all surrounding walls and at entry to mechanical room.*

~~.8~~ ~~*Elementary schools typically have small consumption of domestic hot water. Consider the use of an on demand, high efficiency condensing domestic hot water heater.*~~

~~.9~~ ~~*The contractor shall confirm compatibility with existing water treatment chemicals in the building prior to installation.*~~

.10 *Oversizing larger domestic hot water systems for secondary schools shall be avoided to minimize operational and stand-by losses.*

.11 *Domestic water heaters shall be independent from the heating boiler plant and shall be capable of independent operation. .*

.12 *All domestic hot water tanks to be provided with a drain pan under the tank piped to drain regardless of a house keeping pad provided below the tank.*

.13 *Designs should avoid the use of lift stations for sanitary sewage and use gravity drainage where ever possible.*

4 APPROVED MANUFACTURERS

Backflow Preventors	Clayton, Conbraco, Singer, Watts, Wilkins
Chemical Water Treatment	Dearborn, , IPAC, Pace
Domestic Water Heaters - Instantaneous	Rinnai, Navien, AO Smith
Drains- Area, Roof and Floor	Smith, Ancon, Zurn, Enpoco
Flow and Pressure Switches	Potter, System Sensor
Hose Bibbs	Smith, Ancon, Zurn
Interceptors	Smith, Ancon, Zurn, Mifab
Plumbing Vents	Menzies Welded Aluminum c/w vandal proof caps
Pressure Gauges	Weiss, Amtek, Trerice, Winters
Pressure Reducing and Relief Valves	Watts
Pumps, domestic water	Armstrong, Grundfos (all bronze, stainless)
Pumps, sewage	Hydro-Matic, Toran, Flygt, Meyers, Zoeller, Gould
Strainers	Red & White, Sarco, Armstrong, Mueller, Watts, Conbraco
Thermometers	Weiss, Ashcroft, Trerice, Marsh, Winter, Miljoco, Weksler
Thermostatic Mixing Valves	Danfoss, Symmons, Leonard, Powers
Valves (Ball, Check)	Red & White, , Jenkins, Watts, Sarco, Nibco, Keystone, Jordan,Apco, Braukman, Asco, Moyes and Groves, Lunkenheimer, (not “M” series), Kitz, Centreline, Grinnell, Newman-Hattersley, Zurn, Ancon,Woodford
Valves (Balancing)	T/A, Armstrong, Bell & Gossett
Water Hammer Arrestors	Smith, Ancon, Zurn, Mifab

Water Meters	Neptune, Sensus

5 SUBMITTAL REQUIREMENTS

.1 Operating and Maintenance Manuals

.1 Documentation will be submitted in both paper and electronic file format. The electronic file format shall be in ADOBE PDF format unless otherwise specified.

.2 The Operating and Maintenance manuals are to be submitted hard – post/hot stamped expandable binders with 25% spare capacity for future information. Model VBB-3-5 produced by Vancouver Book Binding (Black).

.3 The following information must be printed in gold foil on the front cover and spline:

[SCHOOL NAME]
[SCHOOL ADDRESS]
MECHANICAL OPERATION & MAINTENANCE MANUAL
VOLUME X OF X
[YEAR]

ARCHITECT:	[INSERT NAME]
MECHANICAL ENGINEER:	[INSERT NAME]
GENERAL CONTRACTOR:	[INSERT NAME]
MECHANICAL CONTRACTOR:	[INSERT NAME]

.4 The PDF format and two hard copy manuals shall include the following information:

.1 PART ONE - DESCRIPTION OF SYSTEMS

.1 Title page indicating project title and the names, addresses, telephone and fax numbers of the Owner, Mechanical Engineer, General Contractor, Mechanical Contractor and the agency preparing the manuals.

.2 Description of systems, including description of system controls, and components comprising the system.

.3 Describe systems operation and sequence of control operation, including start-up, shutdown, and intended response of system

.4 Operation instruction for systems and component.

.5 Description of actions to be taken in event of equipment failure.

.6 Valves schedule and flow diagram.

.2 PART TWO – MAINTENANCE AND TEST INFORMATION

.1 A list of equipment manufacturers, suppliers, and sub-contractors used. Contact information for equipment manufacturers, suppliers, and sub-contractors shall include:

.2 Equipment performance data to include:

.1 Equipment manufacturer's performance datasheets with point of operation as left after commissioning is complete.

.2 Equipment performance verification test results.

.3 Special performance data as specified.

.3 Equipment Maintenance and Test Information. This information shall include:

.1 Maintenance procedures
.2 Maintenance schedule
.3 Lubrication requirements
.4 Exploded parts list
.5 List of part numbers

.4 Copies of hydrostatic testing performed on sanitary and storm systems.

.5 Copies of Inspection Certificates for

.1 Plumbing Piping
.2 Sanitary Sewer Piping
.3 Storm Drain Piping
.4 Domestic Hot Water Heater

.6 Balancing reports for air and water systems provided by Testing, Adjusting and Balancing Agency.

.7 Manufacturer equipment start-up reports. Start-up reports shall be provided for the following equipment:

.1 Domestic Hot Water Heater

.8 Certificate of Guarantee

.3 PART THREE – SHOP DRAWINGS

.1 Include a copy of all Shop Drawings. Version included is to be the version given "Reviewed" status by the Consultant.

6 ~~"RECORD" DRAWINGS~~

~~.1 The Mechanical Consultant must produce "Record" drawings at the end of the project. The cost of producing these drawings must be included in the Mechanical Consultant's fee or a cash allowance in the contract. (It is NOT acceptable for the Mechanical Contractor to produce these drawings.)~~

~~.2 Identify each drawing in lower right hand corner in letters at least 12 mm high as follows: - "RECORD DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (Date).~~

~~.3 The Mechanical Consultant must provide the Prime Consultant with [2] hardcopy sets as well as a CD-DVD containing electronic drawing files in both DWG and PDF format. (The Prime Consultant must forward this material to the VBE within 60 days of substantial completion.)~~

7 PIPING IDENTIFICATION

.1 Identify fluids in piping with markers showing name, pipe size, and service, including temperature and pressure where relevant, and with arrows to indicate flow direction.

8 SYSTEM DEMONSTRATION TO VSB

.1 The Commissioning Agency retained for the project will coordinate and run a training and instruction session for VSB facility operating and maintenance personnel.

.2 The mechanical consultant shall attend the system demonstration and provide an over view of the system design.

.3 The following sub-Contractors are required to participate and assist with the demonstration and training session:

.1 Testing and Balancing Agency

.2 Plumbing Contractor

.3 Manufacturer's representative for:

.1 Plumbing Fixtures
.2 Domestic Hot Water Heater and domestic hot water boiler

.4 The Contractor shall obtain a written release from the VSB representative, stating:

.1 The VSB has received satisfactory instruction in operation and maintenance of all mechanical equipment and systems.

.2 The VSB has reviewed operation and maintenance manuals.

.3 Specified spare parts of components, keys, removable handles, and the like are to be turned over to the Owner.

~~9~~ ~~PLUMBING FIXTURE SPECIFICATION~~

~~Water Closet~~	
~~Water Closet (Accessible)~~	
~~Urinal~~	
~~Lavatory~~	
~~Wall Hung Lavatory (Accessible)~~	
~~Classroom Sink~~	
~~Kindergarten Bubbler~~	
~~Kitchen Sink~~	
~~Art Sink~~	
~~Shop Sink~~	
~~Janitor Sink~~	
~~Drinking Fountain~~	
~~Floor Drain~~	
~~Roof Drain~~	
~~Exterior Hose Bib~~	

END OF SECTION 22 05 00

1 GENERAL

.1 This section includes materials and installation for thermometers and pressure gauges in piping systems.

2 DESIGN REQUIREMENTS

.1 All pressure gauges shall be liquid filled type and shall be complete with isolation valves for removal and maintenance.

.2 All meters and gauges must be installed in locations that are easily readable.

.3 Provide thermometers and gauges on all mechanical systems. The installation of a direct digital control system **DOES NOT** remove the requirement for the installation of the thermometers and gauges.

.4 All meters and gauges shall be located as follows;

.1 Positive Displacement Meters:

.1 Expansion Tank Make-Up water
.2 Natural Gas supply
.3 Domestic cold water compound meter with remote readout in accordance with City of Vancouver requirements.

.2 Pressure Gauges:

.1 Both sides of Pressure Reducing Valves
.2 Pumps - Suction and Discharge
.3 Expansion Tanks
.4 Pressure Tanks
.5 Sprinkler System
.6 Domestic Water Supply Entry
.7 Steam supply

.3 Pressure Gauge Taps to facilitate balancing:

.1 Both Sides of Two Way valves
.2 All Lines to Three Way valves
.3 Major Coils - Inlet and Outlet

.4 Stem Type Thermometers:

.1 Headers to heating and chilled water systems
.2 Boilers - Inlets and Outlets
.3 Domestic hot water tanks and domestic hot water supply, recirculation
.4 Water Zone Supply and Return Mains on heating and chilled water
.5 After Major Coils - Inlet and Outlet

.5 Thermometer Wells:

.1 All Lines to Three Way Control Valves
.2 Individual Return Lines from Heating
.3 All major heating and chilled water coils

3 PRODUCTS

.1 FLOW FITTINGS

.1 Use cast brass threaded on sizes 15mm through 50 mm. Sizes 65mm and over shall be cadmium plated cast steel with welding ends.

.2 Gauge accuracy shall be plus or minus 1% and permanent pressure loss shall not exceed 25% of the pressure differential reading.

.2 PRESSURE GAUGES

.1 Gauges shall be 110mm diameter 1% accuracy cast aluminum case, aluminum ring, phosphor bronze bourdon tube, brass movement, front re-calibrator, and glass window.

.2 Dials shall read metric units kPa and PSI. Face of dial shall be 75mm and scale's midrange shall approximate the design operating value.

.3 All pressure gauges **shall be liquid filled**.

.4 Pressure gauges shall be selected for the correct scale and range of the medium being measured. Full-scale range should be at the equipment's maximum output capability and the operating range should be approximately mid-scale. (e.g. a pumps is capable of delivering 60 PSIG but the system operates at 20 – 40 PSIG then a 0 to 60 PSIG gauge would be selected.

.5 All gauges shall be capable of accepting a maximum pressure input of twice their scale range without damaging the meter.

.3 THERMOMETERS - LIQUID SYSTEMS

.1 Direct Pipe Mount:

.1 Thermometers shall be 225mm scale adjustable angle, cast aluminum case, red reading mercury, and glass front and complete with 20mm NPT brass separable well, Celsius and Fahrenheit scale.

.2 Remote Mount:

.1 Thermometers shall be 115mm scale, wall mountable aluminum case, gas filled dial thermometer, and shatterproof glass front and complete with 20mm NPT brass separable well, Celsius and Fahrenheit scale.

.1 Sensing bulb capillary line shall be encased in an interlock armour shield.

.4 BOILER / SYSTEM MAKE UP WATER METERS

.1 The only approved water meter is the MUELLER MVR30 Standard complete with Pulser Interface Unit, from MUELLER SYSTEMS.

.2 The Pulser Interface Unit shall produce a voltage signal output that is proportional to the delivered flow and will be monitored by the DDC system.

2 EXECUTION

.1 GENERAL

.1 Install so all gauges can be easily read from floor or platform. If this cannot be accomplished, install remote reading units.

.2 INSTALLATION

.1 All fluid meters and gages not using wells shall have isolation ball and device bleed valves valves installed between the device and the fluid, so that the device can be isolated and replaced without draining the fluid.

.2 All in-line fluid devices shall also have unions between them and the isolation valves.

.3 Install positive displacement meters with isolating valves. Provide valved bypass for liquid service meters.

.4 Provide one differential meter for venturi fittings. Provide meter for each range.

.5 Provide one pressure gauge per pump installing taps before strainers and on suction discharge of pump.

.1 Connect pipe to the gauge.

.2 Provide isolation gauge cocks on all pressure gauges.

.6 Pipes that are smaller than 65mm in diameter must be enlarged for installation of thermometer wells.

.1 ***Strap on temperature sensors will NOT be accepted****.*

.7 Install gauges in locations and at angles such that they can be easily read from normal sight.

.1 If the gauge cannot be installed to provide a clear line of sight and an unobstructed view then a remote reading gauge shall be installed.

END OF SECTION 22 05 19

1 GENERAL

.1 This section includes the materials and installation requirements for plumbing pumps for related plumbing systems.

2 DESIGN REQUIREMENTS

.1 Domestic water recirculation systems shall be provided on all domestic hot water systems unless otherwise reviewed and approval obtained from VSB for small systems.

.2 Heat tracing of domestic hot water systems in lieu of recirculation systems shall not be permitted.

.3 Domestic hot water recirculation pumps shall be sized to provide minimum flow and at velocity no greater than 4 feet/second in piping system. No 3600 rpm pumps are permitted.

.4 Domestic hot water recirculation pump shall be controlled by the DDC system and also provided with a water temperature sensor.

.5 Domestic hot water recirculation pump shall be mounted no higher than 1500 mm above the mechanical room floor.

3 PRODUCTS

.1 GENERAL

.1 Pump motors shall be high efficiency.

.2 IN-LINE CIRCULATING PUMPS

.1 The pump shall have high efficiency motor, bronze body, stainless steel impeller and shaft.

.2 The motor shall be a 1750 rpm, drip proof motor. The use of 3,600 rpm motor is not permitted.

.3 The shaft shall have an integral thrust collar and shall be oil-lubricated bronze sleeve bearings.

.4 Pump to be equipped with a water-tight, long-life mechanical seal and be suitable for 862 kPa working pressure.

2 EXECUTION

.1 INSTALLATION

.1 Provide line sized ball valve on suction and discharge side of pump and balancing valve with memory stop.

.2 Shave or replace pump impellers to meet actual operating conditions. Do not cut in balancing valves by more than 20%.

.3 Install pump at serviceable height in mechanical room. Any pump which is not accessible shall be relocated.

END OF SECTION 22 10 00

1 GENERAL

.1 This section refers to the installation of plumbing piping and fittings.

1 DESIGN REQUIREMENTS

.1 *Piping and fittings shall be of **institutional** quality and as per the following sections of the specification.*

.2 *Mechanical type fittings such as "Sharkbit", "Surejoint", "Victaulic" shall not be permitted on plumbing domestic hot and cold water systems.*

.3 *All piping systems shall be sized to allow for 10% future expansion.*

.4 *For new building designs, provide valved and capped connections at ends of corridor for domestic cold and hot water systems for future expansion.*

.5 *For new building designs, provide capped sanitary and storm connections outside building at ends of all corridors for future expansion.*

.6 *Ensure adequate access is provided for all storm and sanitary piping system cleanouts.*

.7 *Only gate valves and ball valves are permitted on water service station and throughout the domestic water systems. Butterfly valves are not permitted.*

.8 *Provide domestic hot and cold water isolation valves for each group of plumbing fixtures and for each washroom group. Ensure that isolation valves are accessible.*

2 PRODUCTS

.1 DRAINAGE WASTE AND VENT PIPING

SERVICE	MATERIAL
Equipment Drains, Overflows, Relief	Schedule 40 Steel, Copper type K.
Sanitary Drainage and Vent (Unburied)	Type "DWV" copper, or Cast Iron. **No ABS Above Grade**
Sanitary and Vent (Buried)	ABS Type DWV or Cast Iron
Storm Drainage (Buried)	PVC, ABS type DWV
Footing Drainage	PVC SDR 35 perforated. PVC SDR 28 for deep burial and high traffic areas.
Storm Drainage (Unburied)	Cast iron or copper type M.
Exterior Rain Water Leaders	Galvanized Pipe
Acid Waste	Poly-vinyl fluoride "Orion/Pegasus" or equivalent

.1 FITTINGS

SERVICE	MATERIAL	JOINT
Equipment Overflows and Drains	Malleable iron 1030 kPA banded, galvanized	Threaded.
Equipment Overflows and Drains	Wrought solder or cast brass	95/5 Solder
Sanitary Drainage and Vent (Unburied)	Wrought Copper	95/5 Solder
Sanitary Drainage and Vent (Unburied)	Cast Iron	Mechanical joint with full stainless steel band clamp.
Sanitary Drainage and Vent (Buried)	Wrought Copper	95/5 Solder
Sanitary Drainage and Vent (Buried)	ABS Type DWV	Solvent Weld
Storm Drainage (Unburied)	Cast Iron	Mechanical joint with full stainless steel band clamp.
Storm Drainage (Buried)	PVC	Solvent Weld
Footing Drainage	PVC	Solvent Weld
Equipment relief	Malleable Iron 1030 kPA	Screwed

SERVICE	MATERIAL	JOINT
Equipment relief	Steel - same as pipe thickness.	Welded
Acid Waste	same as pipe	Stainless steel mechanical

.2 DOMESTIC WATER PIPING

SERVICE	MATERIAL
Domestic water	Copper type K.
Domestic water (buried)	Schedule 40 PVC, Copper type K.
Trap Primers	Polyethylene
Domestic water Service (Outside building)	PVC Ringtite C-900
Domestic water Service (Inside building)	Copper type K, ductile iron – cement lined

.1 FITTINGS

SERVICE	MATERIAL	JOINT
Domestic Water (Unburied)	Wrought Copper	Silvabrite solder (95.5% Sn, 4% Cu, 0.5% Ag).
Domestic Water	Copper	Silvabrite solder (95.5% Sn, 4% Cu, 0.5% Ag).
Domestic Water (Buried – outside service)	PVC Ringtite (C-900)	Mechanical joint complete with restraining device to manufacturers standards
Domestic Water	Ductile Iron Cement Lined	Tyton mechanical joint to manufactures standards.

.2 GATE VALVES

.1 National pipe size 2 and under, soldered.
.2 National pipe size 2 and under, screwed.
.3 National pipe size 2 1/2 and over, flanged.

.3 GLOBE VALVES

.1 National pipe size 2 and under, soldered.
.2 National pipe size 2 and under, screwed.

.4 SWING CHECK VALVES

.1 National pipe size 2 and under, soldered.
.2 National pipe size2 and under, screwed.
.3 National pipe size 2 1/2 and over, flanged.

.5 BALL VALVES

.1 National pipe size 2 and under, screwed or soldered.
.2 National pipe size 2 and over, flanged.

3 EXECUTION

.1 ROUTE AND GRADES

.1 Slope water piping at 0.2% and arrange to drain at low points.
.2 On closed system:
  .1 Equip low points with 20 mm drain valves and hose nipples.
  .2 Provide, at high points on lines and on equipment connections, collecting chambers and high capacity float operated manual air vents.
.3 Grade horizontal drainage and vent piping down in direction of flow, 1% minimum.
.4 Provide automatic air vents at all high points and pipe using 6mm copper to drain complete with ball valve.

.5 For all footing drains provide approved material bed and provide filter cloth as per consultant details and slope piping at minimum 0.5%.

.2 INSTALLATION

.1 Install piping to allow for expansion and contraction.

.1 Make provisions to provide flexible connections in piping systems where required and at all building expansion joints.

.2 Provide clearance for proper installation of insulation and for access to valves, air vents, drains and unions.

.3 All sanitary waste and storm lines capped-off for future shall be provided with invert elevations on as-built drawings.

.4 Avoid locating water and drain piping over electrical equipment.

.5 Avoid piping in exterior walls unless otherwise directed.

.6 Keep piping free from scale and dirt and flush all piping prior to making connections.

.7 Provide accessible valves for all washroom groups hot and cold domestic water services.

.8 All cleanouts for footing drains shall be brought up to finished grade.

.9 Footing drainage fittings and riser extensions to cleanouts at grade shall be PVC or cast iron pipe and fittings.

.10 Supply and install concrete thrust blocks on all underground water piping services to manufacturer's recommendations.

.11 Provide firestopping and smoke seals for piping at penetrations of all fire and smoke rated separations.

.3 VALVES

.1 Isolate equipment, fixtures and branches with ball valves.

.2 Balance recirculation system using lockshield globe valves. Mark settings and record on as-built drawings on completion.

.4 FLUSHING AND CLEANING (DOMESTIC WATER)

.1 Flush entire system for 8 h.

.2 Ensure outlets flushed for 2 hours.

.3 Let stand for 24 hours, then draw one (1) sample off longest run.

.1 Submit to testing laboratory to verify that system is clean to Provincial and local health authority potable water guidelines

.2 Let system flush for additional 2 hours, then draw off another sample for testing.

.5 TESTING

.1 Pressure and hydrostatic test buried systems before backfilling to local authority and consultant requirements.

.2 Test pressure: greater of 1 times maximum system operating pressure or 860 kPa.

.6 PERFORMANCE VERIFICATION

.1 Ensure accessible and that access doors are correctly located and valves and cleanouts are accessible.

.2 Ensure that all traps are primed, trap primers are operational and no sewer gas smells are present.

.3 Ensure fixtures are properly anchored, and caulking installed where required at floor, walls and countertops.

1 GENERAL

.1 This sections covers specialty items related to the plumbing and water distribution systems.

2 DESIGN REQUIREMENTS

.1 For new building design all domestic hot water systems shall be provided with potable water rated expansion tank.

.2 For new building design trap primer systems shall utilize a DDC activated solenoid system.

.3 For new building design when large volumes of domestic hot water are required for changing rooms, and kitchens consideration shall be given to stainless steel storage tanks.

3 PRODUCTS

.1 Products shall be commercial plumbing fixtures complete with accessories, and mounting hardware.

.2 PRESSURE REDUCING VALVE FOR DOMESTIC WATER SERVICE

.1 Direct operated pressure reducing valve suitable for service up to 2070 kPa (300 PSIG), size as shown on the drawings.

.2 Model: Watts Regulator Series #2300

.3 Provide 'Y' type strainer upstream of PRV.

.3 TEMPERATURE & PRESSURE RELIEF VALVES

.1 Model - Watts ASME rated.

.2 Pipe T & P valves with a pipe of full outlet size to floor drain and arrange to prevent splash-over.

.4 WATER HAMMER ARRESTORS

.1 Brass piston type water hammer arrestors in a type 'K' copper casing. Sized as per manufacturers recommendations.

.2 Model: PPP Inc. 'Water Hammer Arrestors' Series 'SC'

.3 Provide Water Hammer Arrestors on hot and cold water supplies to all quick valves, solenoids, and plumbing fixtures, and locate in an upright position between the last two fixtures on a line, or horizontally at the end of line closest to supply source.

.4 Provide access for maintenance to all water hammer arrestors.

.5 DOMESTIC WATER EXPANSION TANKS

.1 Potable water rated expansion tank with heavy duty diaphragm.

.2 Model: Them-X-Trol series

.3 Provide 12mm valve drain connection piped to the nearest floor drain, and pet cock on top of the tank.

.6 DOMESTIC WATER STORAGE TANKS

.1 Glass lined storage tank with CSA approvals, rated for 1033 kPa (150 PSIG) working pressure.

.2 Tanks shall be protected against electrolytic corrosion by easily removable and replaceable magnesium anode rods.

.3 Tanks shall have a minimum 100-mm x 100-mm inspection port.

.4 Tanks to be constructed of heavy gauge steel with baked enamel finish, lined with 50mm thick R-16 polyurethane foam insulation with heavy gauge steel jacket

.5 Supplied with relief valve.

.6 Units shall be supplied with a five year warranty against failure due to corrosion or metal fatigue, or overheating caused by sediment.

.7 TRAP PRIMER SOLENOID SYSTEM

.1 All traps shall be primed with a home run manifold system that is connected to a DDC activated solenoid valve.

.2 The trap primer shall also be provided with a double check valve assembly for cross connection control.

.3 All trap primer manifolds shall be accessible.

.8 APPLICATION

.1 Ensure adequate clearances for servicing and maintenance.

4 INSTALLATION

.1 Installations shall follow manufactures recommendations.

END OF SECTION 22 11 19

1 GENERAL

.1 This section provides specifications on all plumbing fixtures to be installed as part of this project.

2 DESIGN REQUIREMENTS

~~.1 Approved manufacturers for plumbing fixtures should be reviewed with the VSB representative for the latest requirements.~~

.2 In general, all plumbing fixtures shall be suitable for a school environment with respect to ease of use and durability.

.3 The plumbing fixture specification below are suggested fixtures and any deviation from the list below is subject to approval from the VSB.

3 SUBMITTALS

.1 Provide submittals in accordance with Section 22 05 00 Common Work Results For Plumbing – Submittal Requirements.

4 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for the equipment for incorporation into the manuals specified in Section 22 05 00.

5 PRODUCTS

.1 GENERAL

.1 Products shall be commercial plumbing fixtures complete with accessories, and mounting hardware.

.2 WC-1 (STANDARD WATER CLOSET/FLUSH VALVE)

- **American Standard #3451.001 'MADERA**™ FloWise™' Toilet, 381mm high floor mounted, vitreous china with EverClean™
- **Sloan #WES 111-YO 'UPPERCUT'** Water Saving Dual Flush Flushometer.
- **Centoco #AM1500STSCCSS Toilet Seat**, extra heavy-duty solid plastic with Anti-Microbial Compound open front less cover with reinforced stainless steel self-sustaining check hinge, posts, washers and nuts, for elongated bowl.
- Provide **heavy duty brass floor flange**, flange bolts and gasket.

.3 WC-2: (STANDARD WATER CLOSET/HANDI-CAPPED)

- **American Standard #3461.001 'MADERA**™ FloWise™ **420mm HIGH'** Toilet, floor mounted, vitreous china with EverClean™
- **Sloan #WES 115-YG 'UPPERCUT'** Water Saving Dual Flush Flushometer
- **Centoco #820STS Toilet Seat**, elongated heavy duty solid plastic open front with cover, reinforced stainless steel check hinge, posts, washers and nuts.
- Provide **heavy duty brass floor flange**, flange bolts and gasket

.4 WC-3 (WATER CLOSET/KINDERGARTEN)

- **American Standard #2315.228 "Baby Devoro**" toilet, floor mounted, vitreous china syphon flush action bowl, 50mm fully glazed internal trapway, low consumption 4.8 L per flush. Provide a bolt-down tank lid.
- **Centoco #2300 Toilet Seat**, solid plastic open round front less cover, with washers and nuts.
- **McGuire #H166LKN3 Toilet Supply***,* C.P., polished brass, rigid horizontal integral copper sweat tube nipple 9.5mm I.D. x 127mm long, all brass 1/4 turn ball valve angle stop with combination V.P. loose key handle, escutcheon and flexible copper riser.
- Provide **heavy duty brass floor flange,** flange bolts and gasket.

.5 WC-4 (HANDICAPPED WATER CLOSET) FLUSH TANK (OFFICE AREA)

- **American Standard #215DA.104 Cadet Pro** round front toilet, floor mounted, vitreous china bowl, 50mm fully glazed internal trapway, 229mm X 203mm water surface. tank complete, 4.8L per flush and bolt caps.
- **Olsonite round front toilet seat** heavy duty anti-microbial solid plastic open front with cover, with reinforced stainless steel check hinge, posts, washers and nuts
- **McGuire #H166LKN3 Toilet Supply**, C.P., polished brass, rigid horizontal integral copper sweat tube nipple 9.5mm I.D. x 127mm long, all brass 1/4 turn ball valve angle stop with combination V.P. loose key handle, escutcheon and flexible copper riser.
- Provide **heavy duty brass floor flange**, flange bolts and gasket.

.6 U-1: (STANDARD URINAL/FLUSH VALVE)

- **American Standard Washbrook Flowise #6590.001**/7301242-100 Urinal, vitreous china, operates in the range of 0.5 L per flush, Wall Hung, extended sides for privacy, washdown action, flushing rim, 19 mm dia. Top spud, elongated rim, integral P-trap, outlet connection 51 mm 2 wall hangers,
- **#7301242-100** chrome plated, non-metallic strainer.
- **Sloan Optima** Flush valve for Top Spud urinal, 1.9 L factory set flow, quiet action, line powered with 6 VAC step down transformer.

- **Sloan #EL-451 hard wired transformer,** 120 VAC input/ 6 VAC output.
- **Watts #CA-321, Fixture Carrier**, heavy gauge epoxy coated steel offset uprights with welded feet supports.
- **Watts #WUCO Urinal Wall Access** Cleanout, two piece expandable plug with 102 mm diameter stainless steel access cover, secured with vandal proof stainless steel screw.

.7 L-1: (STANDARD LAVATORY/COUNTERTOP)

- **Frankie OV1619/6/1** Basin, 470mm x 416mm x 152 mm deep, 18 gauge stainless steel, front overflow, countertop sink, 4" centers.
- **Delta 87T105 single hole metering slow close Faucet**, with lever handle, crome cover. C.P. C.C., solid cast brass lead-free body, vandal-resistant 1.32 LPM flow.
- **Delta R2570-MIX** thermostatic mixing valve with integral check valves.

- **McGuire #PRODRAINWCC** offset open grid drain, chrome plated cast brass one piece top, 1.5 mm tubular 32 mm tailpiece, integral overflow.
- **McGuire #H170BV** Faucet Supplies, chrome finish polished brass, commercial duty 1/4 turn ball valve angle stop, 13 mm I. D. Inlet x 127 mm horizontal extension tubes, combination V. P. Loose key handle, escutcheon and chrome plated copper riser.
- **McGuire #8872C** P-Trap, heavy cast brass adjustable body, with slip nut, 32 mm inlet, shallow wall flange and seamless tubular wall bend.

.8 L-2: (HANDICAPPED LAVATORY)

- **American Standard #9140.047 'WHEELCHAIR BASIN** single hole, 686mm x 508mm x 76 - 165mm deep, wall hung, vitreous china, 3 hole, 4" centres.
- **Delta 87T105 single hole metering slow close Faucet**, with lever handle, crome cover. C.P. C.C., solid cast brass lead-free body, vandal-resistant 1.32 LPM flow
- **Delta R2570-MIX** thermostatic mixing valve with integral check valves.

- **McGuire #155WCC** offset open grid drain, chrome plated cast brass one piece top, 1.5 mm tubular 32 mm tailpiece.
- **McGuire #H170BV** Faucet Supplies
- **McGuire #8872C P-Trap**, heavy cast brass adjustable body, with slip nut, 32 mm inlet, shallow wall flange and seamless tubular wall bend.
- **Jay R. Smith #0700-27-M31**, Single Carrier

L-3: (STANDARD WALL HUNG LAVATORY)

- **American Standard #0356-421 'LUCERNE'** Basin, 533mm x 450mm x 171mm deep, wall hung, vitreous china, splash back, front overflow, self-draining deck, for concealed arm support, 3 hole, 4" centres.
- **Delta 87T105 single hole metering slow close Faucet**, with lever handle, crome cover. C.P. C.C., solid cast brass lead-free body, vandal-resistant 1.32 LPM flow

- **Delta R2570-MIX** thermostatic mixing valve with integral check valves.
- **McGuire #155AC** Open Grid Drain, chrome plated cast brass one piece top, 17 GA. (1.5mm) tubular 32 mm tailpiece.
- **McGuire #LFH165LKN3**, Faucet Supplies, chrome plated polished brass, heavy duty angle stops, 10 mm I.P.S. Inlet x 76 mm long rigid horizontal nipples, V.P. Loose keys, escutcheon and chrome plated copper riser.
- **McGuire #8872C P-Trap**, heavy cast brass adjustable body, with slip nut, 32 mm size, shallow wall flange and seamless tubular wall bend and escutcheon. Jay R. Smith #0700-Z-27 Basin Carrier, with steel pipe legs, block base feet support and extended concealed arms. (For narrow wall installation provide 'Z' type sleeve for arms.)

.9 S-1: (CLASSROOM SINK WITH BUBBLER)

- **Frankie ALBRS7008P-1/4** Single bowl rectangular countertop mount sink, 3 hole 200mm centreset, bubbler on right ledge, 630 mm x 554 mm x 200 mm deep, Back and right ledge, stainless steel
- **Delta 26C3954 two handle faucet**, rigid gooseneck spout, cast brass body construction, With 1.9 LPM (0.5 GPM) aerator.
- **Delta R2570-MIX** thermostatic mixing valve with integral check valves.
- **McGuire #H170BV** Faucet Supplies, chrome finish polished brass, commercial duty 1/4 turn ball valve angle stop
- **Haws #5017LF** deck mounted bubbler and separate fixture stop.
- **JR Smith #8714-56 solids interceptor**, provide fernco unions on inlet and discharge of interceptor to facilitate easy removal of unit

.10 S-2: (SINGLE BOWL SINK)

- **Kindred Commercial QSL1616/6** single bowl sink, 2 hole, 100mm centers, 350mm X 350mm X 150mm deep, counter mounted, back ledge, 20 gauge 18-8 stainless steel sink
- **Delta 27C4955, 100mm centre**, Two Handle Manual Faucet**,** chrome plated, lead free solid brass body, ceramic 1/4 turn cartridges, 152 mm rigid gooseneck spout, with Vandal Resistant 1.9 LPM non-aerating multi-laminar flow spray outlet. Wrist blade 102 mm long handles with vandal resistant screw.
- **McGuire #H170BV** supplies, C.P., polished brass, rigid horizontal nipple 9.5mm x 125mm long I.P.S., heavy all brass angle stops, with V.P. loose key, escutcheons and flexible copper risers.

- **McGuire 'P' Trap**, cast brass 40mm with cleanout, union and escutcheon.

.11 S-3: (ART SINK WITH 2 SETS OF TRIM)

- **Kindred Commercial #ART36/304-1** trough sink, 486 mm x 968 mm x 203 mm deep, counter mounted, no ledge, 18-10 type 316 18 GA. (1.2mm) stainless steel, self-rimming, satin finish rim and bowls, mounting kit provided, fully undercoated to reduce condensation and resonance, 89mm crumb cup waste assembly with 38 mm tailpiece.

- **TWO Delta 27C4955**, 100mm centre, Two Handle Manual Faucet**,** chrome plated, lead free solid brass body, ceramic 1/4 turn cartridges, 152 mm rigid gooseneck spout, with Vandal Resistant 1.9 LPM non-aerating multi-laminar flow spray outlet. Wrist blade 102 mm long handles with vandal resistant screw.
- **Delta R2570-MIX** thermostatic mixing valve with integral check valves.

- **McGuire #LFH165LKN3**, Faucet Supplies**,** chrome plated polished brass, heavy duty angle stops, 10 mm I.P.S. Inlet x 76 mm long rigid horizontal nipples, V.P. Loose keys, escutcheon and flexible copper riser.
- **JR Smith #8714-56 solids interceptor**, provide fernco unions on inlet and discharge of interceptor to facilitate easy removal of unit

.12 S-4: (SERVERY SINK 3 BOWLS)

- **Franke Commercial #LBT8610P-1 Triple bowl sink** with 2 hole for 203mm centerset, 1330 x 573 X 254 deep, faucet on backsplash, type 304, 18 gauge stainless steel, rim and bowl polished to a #4 satin finish, 89mm crumb cup waste assembly with 40mm brass tailpiece.
- **Two Delta model 26C 3933-835 faucets**, 200mm deckmount with long swing spout.
- **McGuire #8904C P-Trap**, heavy cast brass adjustable body, with slip nut, 51 mm inlet, shallow wall flange and seamless tubular wall bend. Provide tee, adaptors and flex. copper tubing to suit installation.

- **McGuire #LFH165LKN3**, Faucet Supplies, chrome plated polished brass, heavy duty angle stops, 10 mm I.P.S. Inlet x 76 mm long rigid horizontal nipples, V.P. Loose keys, escutcheon and flexible copper riser.
- **McGuire #8904C P-Trap,** heavy cast brass adjustable body, with slip nut, 51 mm size, shallow wall flange and seamless tubular wall bend.

.13 S-5: (STAFF ROOM/KITCHEN SINK)

- **Kindred Commercial QDL2031/8. double bowl sink,** 3 hole, 200 centers, 790 x 520 x 200 deep, spillway, counter mounted, backledge, 18-10 type 302 20 GA. stainless steel, self-rimming, satin finish rim and bowls, 89mm crumb cup waste assembly with 38 mm tailpiece.
- **Delta 100LF-HDF, C.P. 200mm** C.C., deck mounted, solid cast brass lead-free body, 1/4 turn ceramic disc valve cartridges, spout c/w vandal-resistant, #061203A laminar flow aerator 1.9 LPM flow outlet.

- **McGuire #LFH165LKN3**, Faucet Supplies, chrome plated polished brass, heavy duty angle stops, 10 mm I.P.S. Inlet x 76 mm long rigid horizontal nipples, V.P. Loose keys, escutcheon and chrome plated copper riser.
- **McGuire #8912CB P-Trap,** heavy cast brass adjustable body, with slip nut, 38 mm size, box flange and seamless tubular wall bend with cleanout, union and escutcheon.

.14 J-1: (JANITOR SINK)

- **Stern Williams MTB 2424 Mop Sink**, 610mm x 610mm x 254mm deep, floor mounted, precast terrazzo, Integral cast Drain with S.S. domed strainer and lint basket 75mm outlet.
- **Delta 28T9 -Hose Faucet**, C.P. 203mm C.C., wall mounted, solid cast brass leadfree body, 1/4 turn ceramic disc valve cartridges, cast brass lever handles, body mounted vacuum breaker, integral stops, 1219 mm hose and hanger with chrome coupling. Stern

- **Williams A-20 Bumper Guards**, Aluminum.
- **Stern Williams T-40 S.S. Mop Hanger**, **Stern Williams TC-3 Mop Sink Drain Gasket**, connection 75 mm pipes. Stern Williams BP .S.S. back splash for two, sides with corner bracket.
- Mount reduced pressure backflow preventers for both hot and cold water supplies that serve the faucet on the wall above the sink.

.15 DF-2: (DRINKING FOUNTAIN WITH BOTTLE FILLER)

- **Elkay #EZS8WWSLK**; bottle filling station, wall hung, stainless steel, with brushed satin finish, Flexi-Guard safety bubbler, lead-free, self-closing push button valve, automatic flow regulator, vandal-resistant open grip strainer, S.S. Cover Plate. 120/1/60 power supply, **No filter required**.
- **McGuire #HST11LK** Fountain Supplies, C.P. with loose key heavy all brass straight stop(s).
- **McGuire #8872C 'P' Trap**, C.P., polished, cast brass adjustable body, 32mm with cleanout plug, seamless brass wall bend and escutcheon.
- **Jay R. Smith Fountain Carrier**, with steel pipe legs, block

base feet support and plate. Provide adequate support in wall for fountain mounting.

.16 SH-1: (SHOWER)

- **Delta R10000-UNWS #T17TH105-25** pressure balancing mixing valve, brass body, with washerless ceramic drip-free disc valve cartridge, integral hot limit stop, screwdriver stops, metal lever handle, 5.7 L flow per minute.
- **Delta RPW324HDF-1.5** Wall supply elbow / escutcheon, hand shower, adjust spray pattern. Vacuum breaker, between supply outlet and personal shower hose. 1724mm long stainless steel hose and 610 stainless steel slide bar

- **Smith Series 2005B Floor Drain**, all duco coated cast iron body, reversible flashing clamp with seepage openings and adjustable 127mm x 127mm square nickel bronze strainer 6.35mm thick strainer, secured with S.S. screws, 100mm throat on strainer, drain to be suitable for tile floor.
- Provide P-Trap, same material as the connecting pipe drain. Note: Provide service stops. Comply local codes for complete grab bar positions, shower control location and faucet trim kit requirements.

.17 WM-1: (LAUNDRY BOX)

- **Symmons 'ELMINATOR'** #W-600-X Laundry Mate washer box, flush with wall, with single lever operated valve, hose end outlets, copper liner, service stops, 12mm H & CW connection, 40mm drain outlet.
- Cast Brass "P" Trap, 40mm (trap is concealed in wall – provide access as per local codes).

.18 FD-1 FLOOR DRAIN TILED / RESILLIENT AREAS SQUARE

- **Smith Series 2005B Floor Drain**, all duco coated cast iron body, reversible flashing clamp with seepage openings and adjustable 127mm x 127mm square nickel bronze strainer 6.35mm thick strainer, secured with S.S. screws, 100mm throat on strainer. Provide 'P' trap primer connection. Provide heavy duty brass flanges, no ABS

.19 FD-2 FLOOR DRAIN UNFINISHED FLOOR SLAB

- Smith Series 2310 Floor Drain, all duco coated cast iron body, flashing clamp with seepage openings and adjustable 216mm diameter D.I. grate. Provide 'P' trap primer connection. Provide heavy duty brass flanges, no ABS

.20 FD-3 FLOOR FUNNEL FLOOR DRAIN

- Smith Series 3710-F22 Floor Drain, all duco coated cast iron body, reversible flashing clamp with seepage openings and adjustable 209 x 83 oval funnel with 6.35mm thick strainer, secured with S.S. screws. Provide 'P' trap primer connection. Provide heavy duty brass flanges, no ABS

.21 RD-1 ROOF DRAIN LARGE

- **Smith #1015** with a polyethylene dome roof drain, all duco coated 280mm diameter cast iron body with under deck clamp, adjustable extension and sump receiver, flashing clamp with seepage openings, 100mm Outlet, sump receiver, underdeck clamp, extension solid (height to suit roof construction) Refer to Architectural Detail D219

.22 RD-2 ROOF DRAIN

- **Smith #1017 with a #1011** stainless steel gravel guard adjacent to the polyethylene dome roof drain, all duco coated 280mm diameter cast iron body with under deck clamp, adjustable extension and sump receiver, flashing clamp with seepage openings, 100mm Outlet, sump receiver, underdeck clamp, extension solid (height to suit roof construction)

.23 DD-1 DECK DRAIN

- Smith DX1409 deck drain, baked epoxy cast iron body with 50mm outlet, under deck clamp, support collar and nickel bronze face grate. ~~Refer to Architectural Detail D219~~

.24 HB-1 NON-FREEZE HOSE BIB

- **Zurn Z-1320-EZ** Ecotrol ceramic disc wall hydrant, 1/2 turn non-drip, ceramic cartridge, 19mm non-freeze wall type with integral backflow. Stainless steel box and hinged cover with operating key lock. Length to suit wall thickness.

END OF SECTION 22 42 00

Sustainability Goals

1. *The project shall be designed and constructed to meet LEED Gold criteria according to requirements of LEED Canada Reference Guide for Green Buildings, Design and Construction, latest version.*
2. ~~*All LEED credits targeted in the project shall be established through the Integrated Design Process involving all project team members in the early design stages. The summary of all LEED prerequisites and credits where the Mechanical Divisions have either prime or partial responsibility shall be clearly listed in this section. This includes prerequisites and targeted credits in the Water Efficiency (WE), Energy and Atmosphere (EA), Indoor Environmental Quality (IEQ) and Innovation in Design (ID) categories.*~~
3. *The Contractor shall be aware that all LEED prerequisite requirements shall be met with no exceptions and that no changes affecting the LEED certification will be allowed.*

1 SCOPE OF WORK

.1 Provide complete, fully tested and operational mechanical systems to meet the requirements described in the Contract Documents and in complete accordance with applicable Federal, Provincial and Municipal codes and ordinances.

2 HVAC SYSTEM DESIGN REQUIREMENTS

.1 Mechanical system designs must be of intuitional quality and suitable for an educational environment. Preference will be given to systems that are in common use in K-12 school facilities.

.2 System design should keep in mind that VSB operates their systems with an optimal start to bring the building up to temperature then system will shut down during non-occupied times with no set back temperature.

~~.3 The mechanical consultant shall submit to VSB a preliminary design of the proposed mechanical systems for review. The preliminary design must be in the form of preliminary design sketches/drawings and a written report with description and sizes of major equipment. Mechanical room sizes, layout and location of major services to be identified.~~

~~.4 All major system components and design must be accepted by VSB maintenance and building operations before project can proceed to design. The mechanical design will also be reviewed at 50% and 95% completion and all comments must be incorporated prior to permit and tender of the project.~~

.5 Individual temperature control is to be provided for each classroom, gymnasium, library, multi-purpose room, office space and occupied space. The use of commercial roof top units are not permitted other than gas fired make-up air units for teaching kitchen make-up air systems.

~~.6 VSB facilities in general are not air-conditioned and only when required in areas with high internal heat gains. The building architecture should be designed to minimize solar gain and the need for air conditioning. Design incorporating south facing classrooms, libraries and instructional spaces should be minimized.~~

.7 All air systems should be designed to provide 8 air changes/hour of 100% outside air.

.8 All ventilation systems should be designed to supply occupied spaces with 125% of ASHRAE 62.1 requirements at winter design conditions.

.9 Ventilation systems should be designed to maximize free cooling opportunities whenever outdoor temperatures are at or near the interior design set point. The free cooling strategy should be discussed with an approved by the VSB early in the design stage. In the absence of a VSB approved free cooling strategy or alternate, ventilation systems

should be design to provide 8 ACH of 100% outdoor air when the outdoor air is 12 C or high or higher. Ventilation systems need not supply 8 ACH of 100% outdoor air at winter design conditions.

.10 Perimeter heating systems which allow ventilation systems to be shut down during unoccupied times may be considered.

.11 The use of in-floor radiant heating as a primary source of heating for classrooms spaces is not permitted.

.12 All heating water and chilled water piping systems (where applicable) shall have expansion tanks sized for 120% of the calculated expansion tank requirements. Expansion tanks shall be full acceptance volume type with replaceable bladder.

.13 All new construction hydronic heating systems shall be designed to heat the facility using low temperature heating water supply temperatures no greater than 50 deg C. A preferred design heating water supply temperature set point is 48.8 deg C.

.14 De-stratification strategies such as low level return air for areas with high ceilings such as Multi-purpose rooms and Gymnasia should be considered.

.15 Separate exhaust systems for all washrooms, storage rooms, custodial rooms, Home Economics, Science labs and other areas which generate odours, store chemicals, or create dust, to be provided.

.16 Kitchen Exhaust systems to be designed to the latest NFPA 96 standards requirements and consideration should be given to low flow exhaust hoods.

.17 All dust collection systems to be designed to the latest NFPA 66 requirements and provided with separate make-up air systems.

.18 All system such as boilers, chillers, variable speed drives and unitary equipment must be provided with BACnet interface and be capable of connection to VSB building automation systems.

.19 Any systems which require glycol for freeze protection should be separated from the main system with a heat exchanger to ensure the entire system is not filled with glycol.

.20 All major equipment should be located in separate mechanical room spaces and installation of major equipment in ceiling spaces should be avoided.

.21 All critical equipment such as heating water pumps should be designed with 100% redundancy and capable of automatic duty/standby operation.

.22 All system components must be accessible and the access and clearance requirements for each piece of equipment are to be clearly identified on the mechanical drawings. Mechanical equipment must be removable for replacement in the future.

.23 All systems should be provided with easy filter access and should be confirmed at the design stage of the project. Any equipment with filter change requirements in the ceiling space should be avoided.

.24 Systems which employ large central air-handling units and service high occupancy areas such as classrooms should consider air to air heat recovery.

.25 Heat recovery systems which employ refrigerant based coils in exhaust is not preferred and must be reviewed with the VSB prior to design.

~~.26 The use of any radiant heating, including in-slab heating in the building is to be reviewed with the VSB prior to design.~~

~~.27 Geo-exchange systems are not to be used in elementary schools. The use of geo-exchange in other combined facilities and high schools must be reviewed with the VSB prior to design.~~

.28 No trickle ventilation systems or minimum outside air ventilation systems shall be permitted.

3 ENERGY EFFICIENCY STANDARDS

~~.1~~ ~~The building shall achieve an energy performance target based on VSB current building stock energy performance. Elementary schools shall target <= 95 ekWh/sqm/year and high schools shall target <= 120 ekWhr/sqm/year.~~

~~.2~~ ~~The energy density targets shall be confirmed using a computer simulation model for the whole building prepared by the Consultant.~~

~~.3~~ ~~This energy performance target shall be applied to all new construction projects and major renovation projects if they are LEED certified or not~~.

.4 All applicable mechanical equipment shall be selected to meet energy efficiency requirements of the Vancouver Building Bylaw and whichever version of ASHRAE 90.1 is in currently in use.

4 INSTALLATION STANDARDS

.1 Installation of HVAC systems and equipment shall conform to the requirements of the plans and specifications.

.2 Install equipment in locations shown with sufficient access for maintenance and future removal of equipment. Remove and replace improperly installed equipment to satisfaction of the consultant and VSB at no extra cost.

~~.3~~ ~~All HVAC equipment except for equipment required to be outdoors such as condensers shall be fully enclosed within Mechanical Service rooms, and all shop HVAC equipment should be in inside the applicable space, located in a mezzanine or service room with full service height.~~

.4 Piping and ductwork shall be installed in such a way as to conserve head room and interfere as little as possible with the free use of space through which they pass. Service lines shall run parallel or perpendicular to building lines. All duct and pipes at ceiling level shall be kept as tight as possible to beams or other limiting structural members. All pipes and ducts shall be coordinated in elevation to ensure that they are concealed in the ceiling space.

.5 Provide seismic restraints for all equipment, piping and ductwork when required by code.

.6 All isolation valves, balancing valves shall be fully accessible without the use of a lift and provided at each branch line and connection to major equipment and coils. Automatic air vents should also be accessible and identified on as-built drawings. Items that do not meet the satisfaction of the consultant and VSB shall be relocated at no additional cost.

.7 All equipment with electrical connection shall have local disconnect switch in an accessible location and provided with lamacoid label for equipment identification.

.8 HVAC systems and equipment shall be of institutional quality and commonly used in school facilities.

~~.9~~ ~~Where applicable in renovation/addition projects connect to existing systems with no disruption or with as minimal disruption as possible and as previously arranged and agreed with the VSB.~~

~~.10~~ ~~Work shall be coordinated with the VSB Construction Project Coordinator seven days prior to work commencing on site.~~

~~.11~~ ~~**Layout Drawings:** Do not use the Contract Drawing measurements for prefabrication and layout of piping and sheet metal work. Locations and routing are to generally be in accordance with the Contract Drawings, however, layout drawings are to be prepared for all such work. Use established bench marks for both horizontal and vertical measurements. Confirm inverts, coordinate with and make allowances for the work of other trades, accurately layout the work and be entirely responsible for all work installed in accordance with layout drawings. Where any invert, grade, or size is at variance with the Contract Drawings, notify the Consultant prior to proceeding with the work.~~

5 ~~PRODUCTS – CONDITIONS FOR ACCEPTANCE~~

~~.1~~ ~~Approved Equal means the Consultant has deemed the manufacturer capable of producing material, fixture, or equipment of comparable quality.~~

~~.1~~ ~~Products supplied by an approved equal must match the specified product in performance, approximate dimensions, quality of material and quality of workmanship.~~

~~.2~~ ~~If in the opinion of the Consultant, material submitted for review does not meet these criteria, satisfactory material from the equal manufacturer shall be provided, or the Contractor will revert to the Base Bid product.~~

~~.3~~ ~~***Any additional costs incurred due to modifications being required because of use of "equal" or "alternate" equipment shall be borne by the Mechanical Contractor.***~~

~~.1~~ ~~***This will include all mechanical system modifications, room layout reconfiguration, or any modifications required by other trades.***~~

6 PRODUCTS – ~~BASE BID AND~~ APPROVED ~~EQUAL~~ MANUFACTURERS

Access Doors	Acudor, E.H. Price, Maxam, Milcor, Steel Brothers
Air and Dirt Separators	Armstrong, Bell & Gossett, Amtrol,
Automatic Air Vents	Hoffman, Armstrong
Air Handling Unit – Custom (with or without HRV exchanger)	Hunt Air, Engineered Air, Tri-Metal, Haakon, Scott Springfield
Air-handling Units - Modular	McQuay, York, Trane
Backflow Prevention	Watts, Febco, Clayton, Beeco, Wilkins
Boilers - Condensing	~~Viessmann,~~ IBC (wall mounted ~~-~~ 399 MBH) Viessmann (floor mounted)
Boilers – Prefabricated Chiminey	Selkirk, Van Packer, Belvent, Ecco
Coils (Hydronic)	Aerofin, Trane, Engineered Air, McQuay, Carrier, Pace
Commissioning Services	MDT Systems, KD Engineering
Control Dampers - Low Leakage	American Warming, Tamco, Ruskin
Controls - DDC	**Delta (ESC Automation)**
Controls - Pneumatic	Johnson, Honeywell, Powers, Robertshaw
Dampers – Fire and Smoke	Canadian Advanced Air, Maxam, Ruskin, Controlled Air

Duct Cleaning	Enviro-vac, Ace Mobile, Power Suction Services
Ductless Split A/C Units	Mitsubishi, Daikin, LG
Duct Silencers	Vibro Acoustics, VAW Systems
Ductwork – Flexible	Thermaflex, Wiremold, Flexmaster, Canaflex
Ductwork – Round and Oval Spiral	United Sheet Metal, Spiro-Lock, Ecco
Ductwork – Canvas Flexible Connectors	Durodyne, Ventlan
Electric Terminal Heating Units (Baseboard / Convector / Wallfin / Unit Heaters/ Force Flow Heaters)	Chromalox, Q-Mark, Thermolec
Expansion Joints	Flexonic, Hyspan, Uniroyal, Kelflex,Mason, Goodall
Expansion Tanks	Amtrol, Elbi
Fan Coil Units (Standard)	Rosemex, Trane, EngAir, First Co.
Fans – Cabinet	Greenheck, Cook, Twin City
Fans – Ceiling Mounted	Cook, Greenheck, Broan, Nutone, Twin City
Fans – Centrifugal	Buffalo, Northern, Pace, Chicago, AA Air Systems
Fans - Roof Mounted Exhaust	Cook, Greenheck, Twin City
Filters	Farr, Continental, Cambridge
Firestopping and Smoke Seals	3M, Tremco, Hilti
Flow and Pressure Switches	Potter, System Sensor
Gas Pressure Regulating Valves	Fisher, Rockwell
Glycol Make-Up Feed Units	Expanflex, Neptune, Axiom
Gravity Ventilators	Cook, Greenheck, Alumavent
Grilles, Registers and Diffusers	Titus, E.H. Price, Nailor Industries, Krueger, Tuttle & Bailey, Metalaire
Heat Exchangers – Plate	APV, Sondex, Elge, Alpha-Laval, Mueller, Armstrong, Bell & Gossett

Heat Pump Units– Air to Water (provide 2 year warranty)	**Aermec**
Heat Pump Units – Water-to-Water (provide 2 year warranty)	Water Furnace, Florida Heat Pump, Multistack
Hydronic Terminal Heating Units (Baseboard / Convector / Wallfin / Unit Heaters/ Force Flow Heaters)	Runtel, Rosemex, Trane, McQuay, Dunham Bush, Engineered Air
Identification – Pipe and Duct	3M, SMS, Duramark, Bradley
Insulation – Piping	3M, Dow, Fibrex, Knauf, Johns-Manville, Owens Corning, Pittsburgh Corning, Manson, Roxul, Fibreglass Canada, Certainteed
Insulation – Duct Insulation	3M, Dow, Fibrex, Knauf, Johns-Manville, Owens Corning, Pittsburgh Corning, Manson, Roxul, Fibreglass Canada, Certainteed
Insulation – Refrigerant Piping	Armaflex, Armstrong, Nomaco
Insulation Jacketing	Childers, Fiberglas, Johns-Manville, Fattals
Louvres	Airolite, Penn, Westvent, EH Price, Titus
Low Water Cutoffs	McDonnell Miller (Float type with manual reset)
Pipe Couplings - Di-Electric	Watts, AG Specialties
Pipe Fittings and Flanges	Grinnell, Jenkins, Victaulic, Toilet stubs to be lead with brass flange. ABS not acceptable.
Pipe Supports and Hangers	Unistrut, Myatt, Grinnell, Sarco, Taylor
Pipe Couplings - Flexible	Mason, Flexonics, Hyspan, Goodall, Proco
Pressure Gauges	Weiss, Amtek, Trerice, Winters
Pressure Reducing Valves	Watts, Singer
Pressure Relief Valves	Watts, Singer, Braukmann, Conbraco, Sarco
Pumps - In-Line Circulators	**Grundfos, Armstrong**
Pump Suction Guides	Armstrong

Slack Cable Restraints	Square M, Vibra Sonic, VMC-Korfund
Radiation	Trane, Markot, Engineered Air, Dunham Bush, Rosemex
Radiant Panels	Engineered Air, EH Price
Strainers	Red & White, Sarco, Armstrong, Mueller, Watts, Conbraco
Sound Attenuation	IAC, Vibron, Vibro Acoustics
Strainers	Red & White, Armstrong
Tanks – Expansion	Armstrong, Enermax, Watts
Testing, Adjusting and Balancing Agencies	KD Engineering, Western Mechanical Services, MDT Systems.
Thermometers	Weiss, Amtek, Trerice, Winters
Unit Ventilators	**Engineered Air, Apollo**
Valves (Ball, Check)	Red & White, , Jenkins, Watts, Sarco, Nibco, Keystone, Jordan, Apco, Braukman, Asco, Moyes and Groves, Lunkenheimer, (not “M” series), Kitz, Centreline, Grinnell, Newman-Hattersley, Zurn, Ancon, Woodford
Valves, Balancing	T/A, Armstong, Bell & Gossett
Valves, Ball	Red & White, Grinnell, Watts
Valves, Gate & Globe	Red & White, Jenkins, Grinnell, Kitz
Valves – Mixing	Lawlor Series 66, Bradley Hi-low HL45-S59.3545
Variable Speed Drives	**ABB**
Vibration Control Equipment	Vibro-Acoustics, Lo-Rez, Vibron, Korfund, Mason
Water Treatment & Pot Feeder	**Pace**
Water Pressure Reducing Valves	Wilkins, Singer, Watts

7 ELECTRIC WIRING AND MOTORS

.1 All electrical equipment supplied by the Mechanical contractor shall bear CSA label. Obtain special inspection labels required by Provincial Authority having jurisdiction for equipment that does not have a CSA label and/or a ULC label.

.2 All electrical equipment and wiring shall conform to requirements of Canadian Electrical Code, the jurisdiction's Electrical Inspector (Provincial or City inspector), and specified standards.

.3 All electrical motors shall conform to CEMA and CSA standards for hard, continuous service, 100% duty factor, designed to limit temperature rise to 40°C for open housing and 50°C for drip proof housing, and operate 1200 or 1800 RPM unless otherwise specified. Do not use air over or air stream ratings for determining the motor housing temperature rise.

.4 Motors of 15 KW and greater shall have capacitor and thermistor thermal overload protection.

.5 Motor noise criteria; motor noise shall not exceed NC-60 as defined by ANSI S12.2-1995, "Criteria for Evaluating Room Noise.

.6 **All motors used in a variable frequency drive application** shall be inverter duty class F and exceed NEMA MG1-2003, Part 31 specifications with a stator winding insulation rating greater than 1900 volts.

8 SUBMITTAL REQUIREMENTS

.1 Shop Drawings

.1 Provide PDF copies of shop drawings for all equipment.

.2 Identify materials and equipment by manufacturer trade name and model number. Include copies of applicable brochure or catalog material.

.2 Operating and Maintenance Manuals

.3 The work of this section will be performed by a Testing, Adjusting, and Balancing (TAB) Agency will be retained and paid by the Mechanical Contractor.

.4 Documentation will be submitted in both paper and electronic file format. The electronic file format shall be in ADOBE PDF format unless otherwise specified. The PDF format shall include the following capabilities:

.5 The Contractor's obligation for manuals is to provide all documentation to the TAB agency.

.1 The maintenance manual shall contain as a minimum the following sections:

.1 PART ONE - DESCRIPTION OF SYSTEMS

.1 Title page indicating project title and the names, addresses, telephone and fax numbers of the Owner, Mechanical Engineer, General Contractor, Mechanical Contractor and the agency preparing the manuals.

.2 A list of all site Change Orders and Site Instructions.

.3 Description of systems, including description of system controls, and components comprising the system.

.4 Describe systems operation and sequence of control operation, including start-up, shutdown, and intended response of system components to controlling devices.

.5 Description of operation of systems at various loads together with reset schedules and seasonal variances.

.6 Operation instruction for systems and component.

.7 Description of actions to be taken in event of equipment failure.

.8 Valves schedule and flow diagram.

.9 Colour coding chart.

.10 System details and a schematic drawing.

.2 PART TWO – MAINTENANCE AND TEST INFORMATION

.1 A list of equipment manufacturers, suppliers, and sub-contractors used. Contact information for equipment manufacturers, suppliers, and sub-contractors.

.2 Equipment performance data to include:

.1 Equipment manufacturer's performance datasheets with point of operation as left after commissioning is complete.

.2 Equipment performance verification test results.

.3 Special performance data as specified.

.3 Equipment Maintenance and Test Information. This information shall include:

.1 Maintenance procedures
.2 Maintenance schedule
.3 Lubrication requirements
.4 Exploded parts list
.5 List of part numbers

.4 Copies of hydrostatic testing performed on:

.1 Hydronic System Piping (Heating and Chilled Water)

.2 Gas Piping

.5 Copies of Inspection Certificates for all equipment.

.6 Balancing reports for air and water systems provided by Testing, Adjusting and Balancing (TAB) Agency.

.7 Manufacturer equipment start-up reports. Start-up reports shall be provided for all equipment.

.8 A letter bearing the seal of the Engineer stating that all installed fall restraint anchors are of adequate capacity and correctly installed.

.9 Certificate of Guarantee

.3 PART THREE – SHOP DRAWINGS

.1 Include a copy of all Shop Drawings. Version included is to be the version given “Reviewed” status by the Consultant.

.2 The maintenance manuals shall be provided in PDF format. The PDF format shall include the following capabilities:

.2 The Operating and Maintenance manuals are to be submitted hard – post/hot stamped expandable binders with 25% spare capacity for future information. Model VBB-3-5 produced by Vancouver Book Binding (Black).

.3 The following information must be printed in gold foil on the front cover and spline:

[SCHOOL NAME]
[SCHOOL ADDRESS]
MECHANICAL OPERATION & MAINTENANCE MANUAL
VOLUME X OF X
[YEAR]

ARCHITECT:	[INSERT NAME]
MECHANICAL ENGINEER:	[INSERT NAME]
GENERAL CONTRACTOR:	[INSERT NAME]
MECHANICAL CONTRACTOR:	[INSERT NAME]

.2 ~~"RECORD" Drawings~~

~~.1 The Mechanical Consultant must produce "Record" drawings at the end of the project. The cost of producing these drawings must be included in the Mechanical Consultant's fee or a cash allowance in the contract. (It is NOT acceptable for the Mechanical Contractor to produce these drawings.)~~

~~.2 Identify each drawing in lower right hand corner in letters at least 12 mm high as follows: - "RECORD DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (Date).~~

~~.3 The Mechanical Consultant must provide the Prime Consultant with [2] hardcopy sets as well as a CD-DVD containing electronic drawing files in both DWG and PDF format. (The Prime Consultant must forward this material to the VBE within 60 days of substantial completion.)~~

2 EXECUTION

.1 All work shall be carried out following the latest codes, regulations, and standards.

.2 FIRE STOPPING

.1 Fire stopping of all mechanical penetrations shall be provided to building code requirements.

.3 PAINTING REPAIRS AND RESTORATION

.1 Prime and touch up marred finished paintwork to match original.

.2 Restore to new condition, finishes which have been damaged.

.4 CLEANING

.1 Clean interior and exterior of all systems including strainers.

.2 Vacuum interior of ductwork, air handling units, and control panels.

.5 PROTECTION

.1 Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system.

.6 FALL RESTRAINT FOR ROOF MOUNTED EQUIPMENT

1. Where possible locate any roof mounted mechanical equipment or access hatches at least two metres from the edge of any roof three metres or higher above surrounding grade.

2. Where equipment or hatches are located within two metres of the edge of a roof three metres or higher above surrounding grade, provide anchors (at least two per piece of equipment) to which fall restraint equipment can be secured by maintenance workers. Refer also to Part 11 of the Worksafe BC Occupational Health and Safety Regulation.

3. The anchors must be capable of withstanding a load of 800 lbs in any direction. The Mechanical Contractor is to retain the services of a Professional Engineer, registered in the Province of British Columbia to ascertain that all fall restraint anchors installed under this contract are of adequately capacity.

4. At the completion of the project obtain a letter bearing the seal of the Engineer stating that the fall restraint anchors are of adequate capacity and correctly installed.

3 INITIAL EQUIPMENT START-UP

.1 This contractor and their supplier representatives shall be responsible for all initial equipment start-up responsibilities.

.2 The equipment installation shall be checked to ensure that it meets the equipment manufacturer's specified requirements.

.3 The initial start-up of each piece of equipment shall be documented with a start-up checklist and included in the maintenance manual.

.4 Where the equipment supplier's representative is starting up equipment, the manufacturer's checklist shall be included in addition to the above required data.

4 TEMPORARY USE OF EQUIPMENT

.1 Permanent systems and equipment are not to be used during construction period without prior written consent from the ~~Consultant and the~~ VSB.

.2 The temporary use of heating systems shall not limit, reduce, or shorten the length, terms, or conditions of the equipment warranty.

5 IDENTIFICATION

.1 PIPING

.1 Identify fluids in piping with markers showing name, pipe size, and service, including temperature and pressure where relevant, and with arrows to indicate flow direction.

.2 Use CGSB and CSA B53 color codlings and identification systems

.3 Use WH Brady identification tapes, bands, and markers.

.4 For retrofit projects match existing identification system present in building.

.2 Ductwork

.1 On ductwork use black 50 mm high stenciled letters to indicate duct size, duct function (ie: "Supply", "Exhaust") and air handling unit or fan (ie: AHU-1, EF-1, SF-1) to which the duct is connected. Use arrow to indicate air flow direction.

.3 Valves and Controllers

.1 Provide aluminum or lamacoid tags with stamped code lettering and numbers filled with black paint and secured to items.

.2 Provide for all operable valves on all piping systems.

.3 Provide a valve list showing the tag number, the location of the valve and its use, for inclusion in the Operation and Maintenance Manuals.

.4 Ceiling Access Panel Identification

.1 The location of terminal units, valves, etc. above ceiling panels shall have their location identified by means of a data dot. In the case of T-bar ceilings, the data dot shall be placed on the metal T-bar rail, not on the ceiling tile.

.2 A brief description of the piece of equipment ("valve", "DDC",etc) in 12mm brady label shall be provided adjacent to the data dot.

.3 The data dot colors shall be as follows;

.1	Fire Protection Devices/Drains	Red
.2	Control System equipment	Black
.3	HVAC equipment/valves	Blue
.4	Plumbing Equipment/valves	Green

.5 Equipment

.1 Provide factory supplied and installed nameplate on each piece of equipment.

.2 Provide registration/approval nameplates (ie. CSA, ULC, ASME) in accordance with the requirements of authorities having jurisdiction.

.6 Outside Services Valve Boxes

.1 Valve box covers for underground services shall be painted as follows:

.1	Dangerous Materials	Yellow
.2	Protective Materials	Blue
.3	Safe Materials	Green
.4	Fire Protection Equipment	Red

6 INSTRUCTION OF OWNER'S OPERATING STAFF

.1 The Commissioning Agency retained for the project will coordinate and run a training and instruction session for the VSB facility operating and maintenance personnel. Training time to be a minimum of Sixteen (16) hours and include instruction on complete start-up and operating sequences of all mechanical systems and equipment and review of all modes of operation, as indicated in the control sequence of operations.

.2 All mechanical sub-Contractors are required to participate and assist with the demonstration and training session and shall also include but not necessarily limited to;

.1 Controls Contractor

.2 Testing and Balancing Agency

.3 Plumbing and HVAC contractor.

.4 Manufacturer's representative for all major equipment to be determined by the consultant.

.3 The Contractor shall obtain a written release from the Owner or his representative, stating:

.1 The Owner has received satisfactory instruction in operation and maintenance of all mechanical equipment and systems.

.2 The Owner has reviewed operation and maintenance manuals.

.3 Specified spare parts of components, keys, removable handles, and the like have been turned over to the Owner.

7 WARRANTY

.1 The entire mechanical system, including the HVAC systems and equipment components shall be warranted free of defects in materials and workmanship for a period of ***two operating years***.

.1 An **operating** year shall be defined as one complete heating season and one complete cooling season.

.2 The warranty shall include both material and labour.

END OF SECTION 23 05 00

1 GENERAL

.1 This specification section refers to all motor, drives and guards associated with mechanical equipment supplied by the mechanical contractor.

2 SCOPE OF WORK

.1 Refer to equipment schedules and equipment specifications for detailed motor requirements and location of all motors.

3 DESIGN REQUIREMENTS

.1 *Provide premium efficiency motors that meet or exceed current ASHRAE 90.1 standards as per the VBBL.*

.2 *All motors that are driven by variable speed drives to be "invertor duty motors"*

.3 *Provide adequate clearance for removal and replacement of motors for all mechanical equipment.*

.4 *Provide disconnects for all motors within the line of site of the motor and with lockable type in off position.*

.5 *Provide input and output line reactors for all variable speed drives and house in a separate cabinet with ventilation.*

.6 *Consider the use ECM motors for all for all small fans and pumps.*

.7 *All high efficiency motors for distribution pumps and fan system shall have a maximum motor RPM of 1750.*

.8 *Direct drive fan system for air-handling units are not acceptable unless provided with a variable speed drive and designed to provide an additional 20% capacity. The speed drive shall not be run over 60hz to achieve design air flow.*

4 PRODUCTS

.1 All motors shall meet the standards and requirements of the Canadian Electrical Code, NEMA MG-1.

.2 All motors shall be "Premium Efficiency" motors meeting the NEMA PREMIUM EFFICIENCY standards and bear the "NEMA Premium" label.

.3 Three Phase Invertor Duty Motors

.1 Invertor duty winding insulation ratings shall exceed NEMA MG1- Part 31.4.4.2 standards and have a Voltage Withstand Capability of 2000 V in 0.1 µs.

.2 Invertor duty motors shall be NEMA Design B as defined in the ANSI/NEMA MG 1 Standard

.4 Single Phase Motors

.1 Electronically Commutated Motors

.1 Electronically commutated motors (ECM) run more efficiently and have a greater reliability and longer operational life.

.2 All unitary packaged equipment shall be supplied with an ECM motor where possible and generally for small fan coils and pumps.

.3 Motors used in a unit ventilator application shall be provided with motors equipped to have an analogue signal input (0Vdc to 10Vdc) vary the motor speed from 300 RPM to 1300 RPM.

.2 Single Phase Motors

.1 When ECM motors **CANNOT** be provided, single phase, capacitor start motors shall be supplied and shall be TEFC type.

.2 Single phase motor applications on pumps shall:

.1 Contain an automatic reset, thermal overload switch that shuts the motor down upon overheating.

.2 The motor shall have a service factor of 1.15.

.3 Motors shall be Premium Efficiency, two capacitor motors.

.4 Due to the generation of high noise levels, motors shall operate at a maximum of 1750 RPM.

.3 Motor Sheaves

.1 Fit reinforced belts in sheave matched to drive.

.2 For motors less than 10 HP use standard adjustable pitch drive sheaves having ± 10% range.

.3 For motors 10 HP and over use sheave with split tapered bushing and keyway having fixed pitch unless specifically required for item concerned.

.4 Supply one set of spare belts for each set installed in accordance for each motor supplied.

.5 For motors 2hp and larger minimum sheave size shall be 6”.

.4 Belt, Drive Line, and Fan Guards

.1 Provide guards for unprotected belts and drivelines.

.2 The guard shall be removable for servicing.

.3 Provide means to permit lubrication and use of test instruments with guards in place.

.5 Adjustable Speed Drives (Variable Frequency Drives)

.1 The drive manufacturer shall supply the AC drives and all necessary controls as herein specified. The manufacturer shall have been engaged in the production of this type of equipment for a minimum of fifteen years.

.2 The Variable Frequency Drive (VFD) is to consist of a pulse width modulated (PWM) inverter designed for use on a standard NEMA Design B induction motor.

.3 The Variable Frequency Drives (VFDs) shall be provided with output line reactors.

.4 The variable speed drives should be provided with full line bypass capability.

.5 ***Due to the high heat generation capacity of the reactors, load reactors shall be separate from the drive and not enclosed in the same***

.6 All VFDs shall have the same user interface, including digital display, and keypad, regardless of horsepower rating.

.7 The keypad is to be used for local control, for setting all parameters, and for stepping through the displays and menus. The keypad shall be capable of programming all drive functions and parameters.

.8 The VFD shall have the ability to automatically restart after an overcurrent, overvoltage, undervoltage, or loss of input signal protective trip.

.9 The VFD shall have an RS-485 port as standard. The standard protocol shall be BACnet or Modbus interface

.10 The VFD drive shall have the capability of allowing the following minimum DDC interface and shall be hard wired.

.1 Speed input signal.
.2 Speed output/frequency.
.3 Drive fault status.

5 EXECUTION

.1 Comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet for the installation of motors, drives, and guards.

.2 Fasten securely motors and drives in place. Make removable for servicing, easily returned into, and positively in position.

.3 Install and adjust motor to ensure proper alignment between the motor shat, sheave, and driveline.

.4 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting, and cleaning of product.

.5 **Provide manufacturers start-up report for all variable speed drive and provide a written record of all variable speed drive set up parameters and include in the maintenance manual for future reference.**

END OF SECTION 23 05 13

1 GENERAL

.1 This section includes materials and installation for thermometers and pressure gauges in piping systems.

2 DESIGN REQUIREMENTS

.1 Identify all meters and gauges on the mechanical systems schematic in addition to the specifications. In general meters and gauges shall be provided for all mechanical equipment as per the following;

Positive displacement Meters	*Make-up water systems, natural gas, domestic cold water.*
Pressure gauges (liquid filled type)	*Both sides of pressure reducing valves, pump suction and discharge, expansion tanks, pressure tanks, sprinkler systems, domestic water supply.*
Pressure tapings	*Both sides of two way control valves, all sides of 3-way control valves at major coil inlet/outlets.*
Stem/Dial Thermometers	*Major coil supply and return water connections, Boiler and chiller inlet/outlet, zone heating/chilled supply and return mains, domestic hot and return water.*

.2 Ensure that all meters and gauges are installed in locations that are readable without the use of a ladder.

.3 Ensure that all meters and gauges are provided with isolation valves so that gauges are easily removable for replacement.

.4 The installation of a DDC system temperature or pressure sensor does not remove the requirement for the installation of an analog thermometer or pressure gauge.

3 PRODUCTS

.1 FLOW FITTINGS

.1 Use cast brass threaded on sizes 15mm through 50 mm. Sizes 65mm and over shall be cadmium plated cast steel with welding ends.

.2 Use Bell and Gossett (Type A) circuit setters or equal.

.2 PRESSURE GAUGES

.1 Gauges shall be 110mm diameter 1% accuracy cast aluminum case, aluminum ring, phosphor bronze bourdon tube, brass movement, front re-calibrator, and glass window.

.2 All pressure gauges **shall be liquid filled**.

.3 All gauges shall be capable of accepting a maximum pressure input of twice their scale range without damaging the meter.

.3 THERMOMETER - LIQUID SYSTEMS

.1 Thermometers shall be 225mm scale adjustable angle, cast aluminum case, red reading mercury, and glass front and complete with 20mm NPT brass separable well, Celsius and Fahrenheit scale.

.4 WELLS

.1 Wells shall be machined from brass bar stock and complete with cap and chain and 15mm NPT thread.

.5 BOILER SYSTEM MAKE UP WATER METER

.1 Approved water meter is the MUELLER MVR30 Standard complete with Pulser Interface Unit, from MUELLER SYSTEMS.

.2 The Pulser Interface Unit shall produce a voltage signal output that is proportional to the delivered flow to the DDC system.

.6 TEST POINTS

.1 "Pete's Plugs" shall be a 6mm MPT fitting to receiver either a temperature or pressure probe 3mm O.D.

.2 Fitting shall be solid brass with two valve cores of neoprene or Nordel (for heating water).

4 EXECUTION

.1 GENERAL

.1 Install all gauges and meters so they can be easily read from floor or platform. If this cannot be accomplished, install remote reading units.

.2 INSTALLATION

.1 All fluid meters and gages not using wells shall have isolation ball and device bleed valves installed between the device and the fluid, so that the device can be isolated and replaced without draining the fluid.

.2 Pipes that are smaller than 65mm in diameter must be enlarged for installation of thermometer wells.

.1 **Strap on temperature sensors will NOT be accepted**.

.3 Provide thermometers and gauges on all mechanical systems. The installation of a direct digital control system **DOES NOT** remove the requirement for the installation of the thermometers and gauges.

END OF SECTION 23 05 19

1 GENERAL

.1 This section of the specification includes installation and product requirements for hangers and supports for HVAC piping and equipment.

2 DESIGN REQUIREMENTS

.1 Adequate hangers and supports to be provided for all mechanical equipment and to be directly attached to the building structure.

.2 Where vibration is a concern hangers and supports must be spring isolated

.3 Other building systems such as ceiling grids and lighting fixture, cable trays, etc.. are not to be supported off of mechanical equipment hangers.

.4 All penetrations through mechanical room floors are to be provided with cast-in place up stand sleeves to prevent water leakage around piping penetrations. Provide detail on mechanical drawings.

3 PRODUCTS

.1 PIPE HANGERS

.1 Use hot dipped galvanized hangers and provide clevis type hanger on all piping larger than 2" diameter.

.2 Ensure steel hangers in contact with copper piping are epoxy coated.

.3 Provide oversized hangers on all domestic cold water and chilled water piping to allow space for pipe insulation.

.2 RISER CLAMPS

.1 To be galvanized steel or cast iron and to be copper plated for copper piping.

.3 CONSTANT SUPPORT SPRING HANGERS

.1 Springs: alloy steel to ASTM A125, shot peened, magnetic particle inspected, with +/-5% spring rate tolerance, tested for free height, spring rate, loaded height and provided with Certified Mill Test Report (CMTR).

.2 Load adjustability: 10% minimum adjustability each side of calibrated load. Adjustment shall be capable without special tools. Adjustments shall not to affect travel capabilities.

.1 Provide upper and lower factory set travel stops.

.2 Provide load adjustment scale for field adjustments.

.3 Total travel to be actual travel + 20%. Difference between total travel and actual travel shall be 25 mm minimum.

.4 Individually calibrated scales on each side of support calibrated prior to shipment, complete with calibration record.

.4 VARIABLE SUPPORT SPRING HANGERS

.1 Provide spring hangers on equipment when required.

.5 HOUSE-KEEPING PADS

.1 Provide 100 mm high concrete housekeeping pads for base-mounted equipment; size pads 150 mm larger than equipment; chamfer pad edges.

4 Execution

.1 HANGER SPACING

.1 Gas and fuel oil piping: up to national pipe size 1/2: every 1.8 m.

.2 Copper piping: up to national pipe size 1/2: every 1.5 m.

.3 Flexible joint roll groove pipe: in accordance with table below for steel, but not less than one hanger at joints. Table listings for straight runs without concentrated loads and where full linear movement is not required.

.4 Within 300 mm of each elbow.

Maximum Pipe Size : NPS	Maximum Spacing Steel	Maximum Spacing Copper
up to 1-1/4	2.4 m	1.8 m
1-1/2	3.0 m	2.4 m
2	3.0 m	2.4 m
2-1/2	3.7 m	3.0 m
3	3.7 m	3.0 m
3-1/2	3.7 m	3.3 m
4	3.7 m	3.6 m
5	4.3 m	
6	4.3 m	
8	4.3 m	
10	4.9 m	
12	4.9 m	

.2 HANGER INSTALLATION

.1 Install hanger so that rod is vertical under all operating conditions.

.2 Support from structural members. Where structural bearing does not exist or inserts are not in suitable locations, provide supplementary structural steel members.

.3 SLEEVES AND ESCUTCHEONS

.1 Supply and install sleeves in advance of concrete work wherever piping passes through walls and floors.

.2 Extend sleeves through potentially wet floors 50 mm above finished floor level. Pack sleeves full depth and provide floor plate.

.3 Where piping or ductwork passes through floor, ceiling or wall close off space between pipe or duct and construction with non-combustible insulation.

.1 Provide tight fitting metal caps on both sides and caulk.

.4 Install chrome plated escutcheons where piping passes through finished surfaces.

.5 Where any work pierces waterproofing, including waterproof concrete, the Consultant shall approve the method of installation before work is done.

.1 Furnish and install all necessary sleeves, caulking and flashing required to make openings absolutely watertight.

.6 Pipe sleeves which penetrate perimeter walls shall be of the waterproof type consisting of the following:

.1 12 mm thick circular steel plate escutcheon welded to the sleeve and protruding 150 mm beyond the sleeve diameter. Steel plate escutcheon shall be embedded into the centre of the concrete wall.

.2 Seal the sleeve opening with lead wool and seal the exterior part of the sleeve with the concrete wall waterproofing material and expandable OAKUM.

.7 All openings in walls and floors through which pipes pass shall be caulked with non-combustible asbestos fibre free insulation as protection against both fire, smoke and sound transmission.

.8 End portions of the packing shall be impregnated with a fire retardant, lagging adhesive to prevent it from loosening and falling out.

.9 **All mechanical sleeves and shafts shall be completely sealed to prevent the passage of air from one floor to another or from the occupied areas to building shafts or other areas**.

END OF SECTION 23 05 29

1 GENERAL

.1 This section Includes vibration isolation materials and components, seismic control measures and their installation.

2 DESIGN REQUIREMENTS

.1 Adequate vibration isolation is to be specified for all mechanical equipment to ensure that no objectionable vibration and/or noise impacts occupied space within or exterior to the facility.

.2 All equipment with rotating mass such as fans, pumps and compressors of 2 horse power and larger shall be complete with spring isolation.

.3 Roof mounted equipment shall be provided with adequate vibration isolation and/or located over corridors or storage rooms to minimize potential noise within occupied areas of the building.

.4 The installation of seismic restraint shall not interfere with maintenance access of the equipment.

.5 Any noise or vibration that is deemed unacceptable to the VSB or the mechanical consultant shall be corrected prior to building occupancy.

.6 Noise from outdoor equipment shall not exceed the City of Vancouver noise bylaw requirements under all operating conditions and/or provided with a suitable acoustic enclosure.

.7 For all new construction projects all major mechanical equipment shall include the services of an acoustic consultant to review the vibration isolation and noise levels both internal and external to the building. Noise levels shall be 10db less than the 55db City of Vancouver noise bylaw requirements.

3 SCOPE OF WORK

.1 Seismic Restraint

.1 Seismic Restraint shall be provided in accordance with the Vancouver Building bylaw and SMACNA requirements for all mechanical equipment.

.2 The contractor shall retain the services of a Professional Engineer, registered in the Province of British Columbia, and specializing in the design of seismic restraint systems or structural engineering to ascertain that all mechanical equipment installed under this contract are adequately seismically restrained.

.2 Vibration Isolation

.1 Provide vibration isolation for motor driven fans and pumps with electric motors 1/2 HP and greater and on associated piping and ductwork.

.2 Provide vibration isolation hangers or bases so as not to impose any undue stresses on the structure, system, and equipment and to eliminate objectionable noise and vibration transmission to the occupied zone.

.3 Provide spring isolators for motor driven fans and pumps with electric motors 1/2 HP and greater.

.4 Provide canvas flexible connections for ductwork.

.5 Provide braided steel flexible connections for steel piping when connecting to equipment with vibration isolation.

END OF SECTION 23 05 48

1 GENERAL

.1 TAB is used throughout this Section to describe the process, methods and requirements of testing, adjusting and balancing for HVAC.

.2 TAB means to test, adjust and balance to perform in accordance with requirements of Contract Documents and to do other work as specified in this section.

2 DESIGN REQUIREMENTS

.1 All mechanical systems shall be tested, adjusted and balanced to meet design flow rates and capacities on the mechanical drawings and equipment schedules. The consultant is to ensure an adequate scope of work is specified for the TAB.

.2 In the case of existing systems, flows and capacities should be tested prior to design to confirm existing system flow rates. The design should subsequently be adjusted based on available system flow and capacity.

.3 Balancing dampers and balancing valves at pumps and fans should not be used to throttle flow rate by more than 10%. Sheave changes and trimming of impellers should be provided to match performance required.

.4 All balancing and other issues identified by the TAB agency are to be corrected prior to building occupancy.

.5 All balancing valves and balancing dampers, variable air volume boxes and any device require testing, adjusting or balancing must be accessible for the TAB agency and future building maintenance.

.6 A complete TAB report is to be included in the maintenance manual for both building renovations and new construction.

.7 Variable speed drives shall not be used for the final balancing of fan and pump systems for both air and water flow rates.

3 SCOPE OF WORK

.1 Balance, adjust and test air and water systems and equipment, and submit reports.

.2 System balancing shall include, but not necessarily limited to:

- .1 Balancing of supply air systems
- .2 Balancing of return air systems.
- .3 Balancing of exhaust air systems
- .4 Balancing of building relief air systems.
- .5 Balancing of heating, chilled and condenser water systems
- .6 Balancing of domestic hot water recirculation systems

.3 Provide Sheave changes on all fans and trim impellers on pumps as required and do not use balancing dampers and balancing valves to throttle flow by more than 10%.

4 GENERAL

.1 Owner may occupy completed areas of building before Substantial Completion. Cooperate with Owner during testing and balancing operations to minimize conflicts with Owner's operations. Work may need to be scheduled around normal working hours to minimize conflicts with the Owner’s operations.

.2 The Mechanical Contractor shall add balancing valves; provide access, etc., as requested to produce the required system balance at no cost to the VSB.

.3 The Mechanical Contractor shall cover the costs associated with the replacement or repair of insulation which was removed as required by TAB agency at no cost to the VSB.

.4 The Controls contractor shall provide the required EMCS hardware, software, personnel, and assistance to TAB agency as required to balance the systems at no cost to the VSB.

5 QUALITY ASSURANCE

.1 Air systems balancing shall be in general accordance with the latest editions of the Associated Air Balance Council's "AABC National Standards for Total System Balance" and ASHRAE standards.

.2 The TAB agency shall remove and re-install ceiling tile to provide access to ductwork and piping. The Balancing contractor shall inspect coils for damage and ensure they are free from debris before testing.

.3 Witnessing of all tests by the Consultant and/or VSB shall be at their option. Advise the consultant and/or owner of the time and location of tests. Provide at least three (3) working days of notification before commencing work.

6 BALANCE REPORT

.1 The Balancing Agency will provide a report, in both hard copy and PDF digital format, for inclusion in the Operating and Maintenance Manuals, describing the final balanced operating conditions of the mechanical systems outlined below.

.2 A preliminary copy of the report is to be submitted for the Consultant's review two weeks before Substantial Performance, and the final version submitted at the time of Substantial Performance. Submission of the final report will be a requirement of declaration of Substantial Performance.

.3 Provide balancing data in a spreadsheet table format.

.1 Water Balance Information:

.2 Air Balance Information:

.4 Provide two (2) copies of the report in editable electronic format to the Consultant for review. Documents and tables shall be provided in ADOBE PDF, MICROSOFT EXCEL, MICROSOFT WORD, and AUTOCAD drawing formats.

.1 Diffuser layouts and drawings are to be provided in AUTOCAD.

.5 Submit final report for inclusion into Operating & Maintenance Manuals. This will require three (3) hard copy printouts and one electronic file in ADOBE PDF format.

7 SYSTEMS BALANCING

.1 AIR SYSTEMS

.1 Perform testing and balancing procedures on each system according to the procedures contained in the latest edition of AABC's "National Standards for Total System Balance" and in this Section.

.2 Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the mini-mum extent necessary for testing and balancing procedures.

.3 Upon completion of water piping systems and after hydrostatic testing and cleaning, each piping system shall be balanced.

.4 Balance air quantities to between **100% and 105% of design** requirements.

.1 Indicate in the balance report:

.1 Operating performance (design vs. actual) of all fans and air systems.

.2 Airflow from each overall fan system and individual supply and exhaust outlets.

.3 Outdoors airflow from each air handling unit and unit ventilator, with outdoor air damper at minimum position.

.4 Inlet and outlet pressure of each air handling unit, unit ventilator and exhaust fan. (Total system pressure drop)

.5 Motor HP draw, lock rotor amperage, running load amperage and fan and motor RPM of each air handling unit and unit ventilator.

.6 Airflow through individual VAV boxes and individual supply and exhaust.

.7 Indicated all design and balanced air flows on mechanical as-built drawings.

.2 WATER SYSTEMS

.1 Use a portable differential pressure meter in conjunction with circuit balancing valves to determine flow rates and pressure drop characteristics of required water systems.

.2 Set balance valves and balance fittings to obtain uniform pressure and/or temperature differences across terminal heating/cooling elements and coils, acknowledging the differences of design pressure and/or temperature drop/rises.

.3 Adjust the water distribution systems using balancing cocks, valves, and fittings. Do not use service or shut-off valves for balancing.

.4 Balance water flow rates to between **100% and 105% of design** requirements.

.5 Do not use service or shut-off valves for balancing water systems.

.6 The domestic hot water re-circulation system shall be balanced using memory stop type balancing cocks.

.7 Adjust pumps to deliver total design gpm.

.1 Where pump delivery substantially exceeds system requirements, and manufacturers' pump curves indicate a reduction in impeller size will accomplish required flow, trim impellers to match pump performance to system characteristics. The cost of doing so will be considered as an extra cost to the contract.

.2 Measure total water flow.

.3 Position valves for full flow through coils.

.4 Measure flow by main flow meter, if installed.

.5 If main flow meter is not installed, determine flow by pump total dynamic head (TDH) or ex-changer pressure drop.

.6 Measure pump TDH and verify pump impeller size by measuring the TDH with the discharge valve closed. Note the point on manufacturer's pump curve at zero flow and verify that the pump has the intended impeller size.

.7 With all valves open, read pump TDH. Adjust pump discharge valve until design water flow is achieved.

.8 Monitor motor performance during procedures and do not operate motor in an overloaded condition.

.9 Adjust flow-measuring devices installed in mains and branches to design water flows.

.10 Measure flow in main and branch pipes.

.11 Adjust main and branch balance valves for design flow.

.12 Re-measure each main and branch after all have been adjusted.

.13 Adjust flow-measuring devices installed at terminals for each space to design water flows.

.14 Measure flow at all terminals.

.15 Adjust each terminal to design flow.

.16 Re-measure each terminal after all have been adjusted.

.17 Position control valves to bypass the coil and adjust the bypass valve to maintain design flow.

.18 Perform temperature tests after all flows have been balanced.

.19 For systems with pressure-independent valves at the terminals:

.20 Measure differential pressure and verify that it is within manufacturer's specified range.

.21 Perform temperature tests after all flows have been verified.

.22 For systems without pressure-independent valves or flow measuring devices at the terminals:

.23 Measure and balance coils by either coil pressure drop or temperature method.

.24 If balanced by coil pressure drop, perform temperature tests after all flows have been verified.

.25 Mark the final balance position on all balance valves and balance fittings.

.26 Verify that all memory stops have been set.

.8 Indicate in the balance report:

.1 Operating performance (design vs. actual) for all primary and secondary circuit pumps. Include measured flows, measured pressures, and pump curves.

.2 Temperature and pressure drops in the primary and secondary loops.

.3 Flows through all AHU heating coils, unit ventilators, reheat coils and convector/baseboard heating elements.

.4 Temperature drops in all AHU heating coils, unit ventilators, reheat coils and convector/baseboard heating elements.

.5 Motors, 1/2 HP and Larger: Test at final balanced conditions.

.6 All temperature and pressure readings taken for balancing heat exchangers.

.7 All safety valve locations, sizes pressure ratings, temperature ratings, and relief settings.

.9 Indicate all balancing valve locations on the as built mechanical drawings along with design and actual balanced flow rate.

END OF SECTION 23 05 93

1 GENERAL

.1 The reference standard in this specification shall be in accordance with latest edition of the (BCICA) British Columbia Insulation Contractors Association of British Columbia standards manual, together with all authorized additions and amendments.

.2 Provide insulation for the following;

.1 Provide piping insulation.
.2 Provide ductwork and plenum insulation.
.3 Provide equipment insulation.
.4 Provide adhesive, tie wires, tapes.
.5 Provide recovering.
.6 Fire Stopping

2 DESIGN REQUIREMENTS

.1 All ductwork, piping and equipment to be insulated in accordance with the latest version ~~o~~ of ASHRAE 90.1 as per the VBBL.

.2 All exposed piping and ductwork shall be provided with canvas or PVC jacket material as per this specification.

.3 All exterior piping shall be provided with aluminum jacket material and all edges to be sealed and ~~mater~~ waterproof.

3 GENERAL

.1 This section of the specification is to form part of the contract documents and is to be read, co-coordinated and interpreted in conjunction with all other aspects of the specification. This project is to be registered with the BCICA quality assurance program (QAC)

.2 Section Includes insulation for piping and HVAC systems as follows:

4 DEFINITIONS:

.1 For purposes of this section:

.1 "CONCEALED" - insulated mechanical services and equipment in suspended ceilings and non-accessible chases and furred-in spaces.

.2 "EXPOSED" - means “not concealed" as previously defined. Visible in the building and mechanical rooms.

5 SUBMITTALS

.1 Provide submittals in accordance with Section 23 05 00 Common Work Results For HVAC – Submittal Requirements.

6 QUALITY ASSURANCE

.1 Qualifications:

.1 The project requires the Mechanical Insulation Contractor to register this project with BCICA and the installation is to be in full compliance with the BCICA quality assurance program (QAC)

.2 Where any installed insulation becomes water soaked, damaged, or soiled in the course of the work, it shall be removed from service and from the site and shall be replaced with new insulation products in good condition. Where any insulation products that are stored on the site become water soaked, damaged, or soiled, they shall be removed from the site and replaced with new products in good condition. All insulation materials shall be stored in a clean, dry space and shall

be protected from dust, dirt, moisture, and physical damage. No insulation products shall be installed unless the installation is protected from dust, dirt, and moisture.

.3 Where the bottom of convector or wall fin cabinets are located more than 150 mm (6") above the finish floor the branch piping connections shall be insulated up to the bottom of the cabinet.

7 PRODUCTS

.1 FIRE AND SMOKE RATING

.1 To CAN/ULC-S102:

.1 Maximum flame spread rating: 25.

.2 Maximum smoke developed rating: 50.

.2 PIPE INSULATION

.1 Pipe insulation shall be preformed mineral fibre complete with an integral jacket.

.1 Mineral fibre includes glass fibre, rock wool, or slag wool.

.2 Mineral fibre to meet ASTM C553 standards.

.3 Thermal conductivity ("k" factor) not to exceed specified values at 24 °C mean temperature when tested in accordance with ASTM C335.

.2 Pipe insulation thickness shall meet the requirements of Table 1. Electric heat traced piping not listed in Table 1 shall have a minimum 25 mm thick insulation, unless otherwise specified in section.

.3 Applications for pipe insulation shall be as follows:

Application	BICA Insulation Type	Thermal Conductivity (at 24°C)
All Hydronic Piping	A2- Mineral Fibre (low & medium temperature)	0.033W
All domestic water piping	A2- Mineral Fibre (low & medium temperature)	0.033W
Waste Arms and P-trap at Handicapped Sinks	A2- Mineral Fibre (low & medium temperature)	0.033W
Roof Drains and Interior Rain Water Leaders, traps subject to freezing	A2- Mineral Fibre (low & medium temperature)	0.033W
DX Refrigerant Suction / Liquid Piping	A6- Closed Cell Polyurethane Foam	0.027W

.3 REFRIGERANT PIPING

.1 Provide 25-mm (1-inch) thick flexible foamed elastomeric insulation on all liquid suction piping and on hot gas piping where run inside the building. Insulation to be type A6 as defined by BCICA Quality Standards specification 1501-C.

.2 Provide canvas finish on all piping within ceilings used as return air plenums.

.3 Provide aluminum jacket for insulated piping exposed outside the building.

.4 THE INSULATION JACKET MATERIAL SHALL BE:

.1 ULC Listed Canvass:

.1 220 gm/m^2 cotton, plain weave, treated with dilute fire retardant lagging adhesive to ASTM C921.
.2 Lagging adhesive shall be compatible with insulation.
.3 The maximum VOC limit shall be 50 g/L to GSES GS-36.

.2 PVC (Polyvinyl Chloride):

.1 To ASTM 1784 Standards.
.2 Flame Spread Rating: 25 or less.
.3 Smoke Spread Rating: 50 or less.
.4 Thickness: 0.50mm sheet.

.3 Aluminum:

.1 To ASTM B209 with moisture barrier as required by application.
.2 Thickness: 0.50 mm sheet.
.3 Finish: Smooth.
.4 Jacket banding and mechanical seals: 19 mm wide, 0.5 mm thick stainless steel.

.4 The following accessories shall be used as required:

.1 Vapour retarder lap adhesive:

.1 Water based, fire retardant type, compatible with insulation.
.2 The maximum VOC limit shall be 50 g/L to GSES GS-36.

.2 Indoor Vapour Retarder Finish:

.1 Vinyl emulsion type acrylic, compatible with insulation.

.3 Insulating Cement: hydraulic setting on mineral wool, to ASTM C449.

.4 Tape: self-adhesive, aluminum, plain reinforced, 50 75 mm wide minimum.

.5 Contact adhesive: quick-setting

.1 The maximum VOC limit shall be 50 g/L to GSES GS-36.

.6 Canvas adhesive: washable.

.1 The maximum VOC limit shall be 50 g/L to GSES GS-36.

.7 Tie wire: 1.5 mm stainless steel.

.8 Banding: 12, 0.5 mm thick stainless steel.

.9 Facing: 25 mm stainless galvanized steel hexagonal wire mesh stitched on one faces both faces of insulation one face of insulation with expanded metal lath on other face.

.5 Insulation covers:

.1 Insulation covers shall be flexible mineral fibre 40mm thick.

.2 Insulation shall be covered with silicone glass cloth with belts to secure the insulation.

.3 Provide and install flexible removable insulation covers on:

.1 Expansion joints,

.6 Finishes:

.1 PF2 Premium 2

.1 A factory applied integral all-service type jacket on the pipe insulation may be used as the sheathing paper. The factory-applied jacket shall be neatly applied to receive the treated fabric jacket.

.2 Over the pipe insulation apply a layer of sheathing paper adequately stapled in place, then apply treated fabric jacket with fabric adhesive.

.3 Over insulated fittings, apply PVC fitting covers. Over insulated valve bodies, valve bonnets, strainers and flanges apply treated fabric jacket with fabric adhesive.

.4 Finish fabric with two (2) coats of fabric coating imbedded into fabric.

.2 PF3 Economy

.1 Apply pipe insulation with an integral all-service type jacket. Secure jacketing using necessary fastenings on approximately 100 mm centres. Cover longitudinal and circumferential joints with jacket finishing tape neatly applied. Alternately, secure jacketing longitudinal joint using integral self-sealing lap. Cover circumferential joints with jacket finishing tape.

.2 Over insulated fittings, apply PVC fitting cover.

.3 Over insulated valve bodies, valve bonnets, strainers and flanges apply all-service jacketing using necessary fastenings and jacket finishing tape, or alternately use PVC fitting covers.

.3 PF4 Metal Jacket

.1 Over the pipe insulation, apply Aluminum jacket using necessary fastenings on approximately 150 mm centres.

.2 Over insulated fittings, valve bodies, valve bonnets, strainers and flanges apply aluminum metal jacket or preformed metal fittings to provide a complete jacket system, Secure with necessary fastenings.

.4 PF5 PVC Jacket

.1 Over the pipe insulation, apply PVC jacket using necessary fastenings on approximately 100 mm centres. Cover circumferential joints with finishing tape, PVC adhesive or self sealing tape neatly applied.

.2 Over insulated fittings, valve bodies, valve bonnets, strainers and flanges apply PVC jacket or preformed PVC fitting covers to provide a complete jacket system. Secure with necessary fastenings and jacket finishing tape.

.1 The use of PVC jacket or fitting covers is limited by the 1995 National Building Code requirements for Smoke Developed Classification.

.5 Concealed Piping: No further finish required.

.6 Exposed Piping: Apply finishes as follows:

Application	Finish	
Heating Water/chilled water/condenser water	PF-2 - Premium 2	PF-5 PVC Jacket
Domestic Hot and Cold Water and re-circulation	PF-2 - Premium 2	PF-5 PVC Jacket
Roof Drains, Rain Water Leaders and Vents	PF-2 - Premium 2	PF-5 PVC Jacket
Waste Arms & Traps at Handicapped Sinks	PF2 - Premium 2	PF-5 PVC Jacket
Condensate drains	PF2 - Premium 2	PF-5 PVC Jacket
All Piping Outdoors (including refrigeration piping)	PF4 - Metal Jacket	-
All Other Insulated Piping	PF2 - Premium 2	PF-5 PVC Jacket

.5 DUCT INSULATION:

.1 The duct insulation shall be:

.1 Flexible Acoustic Duct Liner for all Outdoor Air, Supply Air, Transfer Air & Return Air Systems shall be 25-mm (thick, closed-cell, moisture resistant, elastomeric acoustic duct liner with washable surface, Nomaco K-Flex Gray Duct Liner, Rubatex Insul-sheet R-1800 FS Elastomeric Insulation, AP Armaflex or approved equal.

.2 Exhaust duct insulation shall be mineral fibre.

.3 Mineral fibre includes glass fibre, rock wool, or slag wool.

.4 Mineral fibre to meet ASTM C553 standards.

.5 Thermal conductivity ("k" factor) not to exceed specified values at 24 °C mean temperature when tested in accordance with ASTM C335.

.1 BCICA Rigid Insulation Class A.1 without vapour barrier:

.1 Rigid mineral fibre board to ASTM C612.
.2 Water repellant.
.3 Vapour permeable.

.2 BCICA Rigid Insulation Class A.2 with vapour barrier:

.1 Rigid mineral fibre board to ASTM C612.

.2 Light weight.

.3 Non-wicking

.2 Flexible duct insulation shall be:

.1 Mineral fibre blanket to ASTM C553.

.6 FIRE STOPPING

.1 Fire stopping and Smoke Seal Systems: Asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of CAN4-S115-M85, or ULI 1479 and ASTM 814, and not to exceed opening sizes for which they are intended.

.2 Approved Fire stopping Systems:

.1 DOW FS 2000/2001

.2 Tremco Fyre-Sil/Self Leveling

.3 3M Fire Stopping

.4 Hilti Fire Stopping

.5 Nuco Fire Stopping

2 EXECUTION

.1 PIPE INSULATION

.2 HOT PIPING

.1 Piping insulation thickness shall be selected as per Table 1:

TABLE 1

Pipe Insulation Thickness - Hot Piping

	Max. Operating Temp (°C)	Run-outs ≤ 50 mm (4 m max.)	≤ 25 mm	30 mm to 50 mm	65 mm to 100 mm	150 mm	≥ 200mm
Med. Temp. Htg Water Supply/Return	40 to 93.3	25	40	40	50	50	90
Dom. Hot Water Incl. Recirc.		12	25	25	40	40	40
Waste Arm & P-trap on H/C sink		-	-	12	-	-	-

.2 Apply insulation to hot piping in accordance with Specification 1501-H. Include insulation on valve bodies, air separators, strainers, flanges, and pump bodies.

.1 Piping:

.1 Pipe covering with integral jacket shall be held in place by stapling the flap on 75 mm centres.

.2 Pipe covering with integral self-sealing jacket will not require additional fastening.

.2 Fittings:

.1 Fittings shall be insulated using the following methods:

.1 Insulate fittings with sections of the pipe covering mitred to fit tightly. Mitre to 45º on small pipe.

.3 Valves, Strainers:

.1 Valves and strainers shall be insulated using the following methods:

.1 Fitted pipe coverings.

.2 Drains, blow-off plugs and caps shall be left uncovered.

.4 Flanges:

.1 Flanges shall be insulated using the following methods:

.1 Insulate flanges with oversized pipe covering.

.2 Mitered blocks to the thickness of the adjacent pipe covering.

.5 Insulation Termination Points:

.1 Terminate insulation 75 mm from fittings to provide working clearance and bevel insulation at a 45º angle or provide PVC end caps.

.2 Seal the exposed end of the beveled insulations with a coat (minimum 1 litre per 1.5 m²) of weather coating

.3 Flexible insulation cover shall extend 100 mm beyond end of flanges and shall be custom fitted.

.4 For A3 insulation, apply in 2 layers and offset joints. Apply cold and touch-up after system is energized.

.5 Insulation for electric heat traced systems shall be sized to allow for presence of heater cable.

.6 Insulation for electric heat traced systems shall be vapour sealed where capillary tube exits insulation.

.3 COLD PIPING

.1 Piping insulation thickness shall be selected as per Table 2:

TABLE 2

Pipe Insulation Thickness - Cold Piping

	Max. Operating Temp (°C)	Run-outs≤ 50 mm (4 m max.)	≤ 25 mm	30 mm to 50 mm	65 mm to 100 mm	150 mm	≥ 200mm
Domestic Cold Water		12	25	25	25	25	25
Condensate drains from cooling units		25	25	25	25	25	25
Refrigerant suction / liquid		25	25	25	25	25	25
Roof drains & interior RWL			-	25	25	25	25
Traps subject to freezing		-	-	25	25	25	-
Plumbing vents			-	-	-	-	-

.2 Apply insulation to cold piping in accordance with Specification 1501-C. Include removable insulation on valve bodies, air separators, valve bonnets, drain bodies, fittings, couplings, strainers, pump bodies, and flanges.

.1 Piping:

.1 Apply pipe covering with integral vapour barrier jacket to piping and hold in place by securing the jacket flap.

.2 Seal all flaps and butt strips with vapour barrier adhesive or alternately secure with staples and cover with a heavy brush coat of barrier coating.

.3 Pipe covering with integral self-sealing vapour barrier jacket will not require additional fastening.

.2 Fittings:

.1 Insulate fittings with section of the pipe covering mitered to fit tightly, or strips of flexible insulation.

.2 Apply reinforcing membrane embedded in barrier coating, or apply reinforced foil scrim tape.

.3 Alternately, insulate fittings with tightly placed flexible insulation and apply PVC fitting covers.

.1 The 1995 National Building Code limits the use of PVC jacket or fitting covers, for Smoke Developed Classification.

.3 Valves, Strainers:

.1 Insulate valve bodies, bonnets and strainers with insulating cement; or fitted pipe coverings, or mitered blocks all to thickness of adjacent pipe covering,

.2 Apply reinforcing membrane embedded in barrier coating.

.3 Drains, blow-off plugs and caps shall be left uncovered

.4 Flanges:

.1 Insulate cold flanges with oversized pipe covering or mitered blocks to the thickness of the adjacent pipe covering

.2 Apply reinforcing membrane embedded in barrier coating.

.3 Provide high density insulation or insulation blocks at all pipe hangers with minimum 12mm pipe circumference for length of pipe shield. Provide insulation shields.

.4 All insulation joints and fittings shall be vapour sealed.

.5 Extend Insulation through sleeves for fire walls. Provide approved fire stopping.

.6 Insulation for electric heat traced systems to be sized to allow presence of heater cable.

.7 Insulation for electric heat traced systems shall be vapour sealed where capillary tube exits insulation.

.4 FINISHES

.1 Concealed Piping: No further finish required.

.2 Exposed Piping: Finish as per finish table included in this specification.

.2 DUCT INSULATION

.1 Provide and apply insulation to ductwork and plenums in accordance with BCICA Quality Standards Specification 1502, Ductwork and Plenum, as hereinafter specified and/or modified.

.2 Insulation shall be provided as follows:

Mechanical System Application	BICA Insulation Type	Application Type
Outdoor Air Ductwork and plenums (intake to mixing plenum)	50 mm thick, A.2 - rigid or flexible insulation (with vapour barrier).	Internally Applied
Combustion/Relief Air Ducts	50 mm thick, A.2 - rigid insulation (with vapour barrier).	Externally Applied
Sheet Metal Rectangular / Round Supply Air Ductwork (Exposed – Air conditioned)	50 mm thick, A.2 - rigid or flexible insulation (with vapour barrier).	Externally Applied
Sheet Metal Rectangular / Round Supply Air Ductwork (Concealed – Air Conditioned)	25 mm thick, B.2 - flexible insulation (with vapour barrier) System	Externally Applied
Ductwork Where Exposed to Outdoors	50 mm thick, C.2 flexible duct liner with foil faced vapour barrier	Internally Applied
Mixed air plenum	25 mm thick, C.1 closed-cell	Internally Applied
Exhaust ducts within 3 meters of exterior walls or roof	25mm thick B.2 flexible insulation with vapour barrier	Externally Applied
Acoustic Lining	25 mm thick, A.2 closed-cell	Internally Applied

.3 **<u>External Rigid Insulation (Duct and Plenum)</u>**

.1 Hot: Apply insulation in accordance with Specification ER/1:

.1 Preparation:

.1 Fix mechanical fasteners to both horizontal and vertical surfaces at approximately 300 mm centres, each way.

.2 Application:

.1 Cut insulation with integral vapour barrier to required size and apply to exterior of duct and/or plenum, with horizontal surfaces overlapping vertical surfaces and edges tightly butted together.

.2 Secure insulation by impaling on mechanical fasteners.

.3 Where mechanical fasteners penetrate vapour barrier, and at all corners and joints, apply vapour barrier tape or vapour barrier strips adhered with vapour barrier adhesive.

.4 Where raised seams are encountered, secure to the seams an overlapping strip of flexible insulating material with integral vapour barrier to provide a continuous vapour barrier.

.5 For external applications of rigid insulation where the use of mechanical fasteners is unsuitable due to space limitations, fastenings, insulation adhesive, or other suitable method of attachment may be substituted.

.2 Cold: Apply insulation in accordance with Specification ER/2:

.1 Preparation:

.1 Fix mechanical fasteners to both horizontal and vertical surfaces at approximately 300 mm on centres, each way.

.2 Application:

.1 Cut insulation with integral vapour barrier to required size and apply to exterior of duct and/or plenum with vapour barrier to the warm side with horizontal surfaces overlapping vertical surfaces and butt edges together tightly.

.2 Secure insulation by impaling on mechanical fasteners.

.3 Where mechanical fasteners penetrate vapour barrier, and at all corners and joints, apply vapour barrier tape or vapour barrier strips adhered with vapour barrier adhesive.

.4 Where raised seams are encountered, secure to the seams an overlapping strip of flexible insulating material with integral vapour barrier to provide a continuous vapour barrier.

.5 For external applications of rigid insulation where the use of mechanical fasteners is unsuitable due to space limitations, fastenings, insulation adhesive, or other suitable method of attachment may be substituted.

.3 Insulation shall be secured with 100% coverage of insulation adhesive and mechanical fasteners at 30cm on centre.

.4 Cut off ends of fasteners and apply vapour barrier tape to totally cover fastener clips.

.4 <u>External Flexible Insulation (Duct)</u>

.1 Hot: Apply insulation in accordance with Specification EF/1:

.1 Preparation:

.1 On round ducts and on rectangular ducts 740 mm or less in width, no preparation is necessary.

.2 On rectangular ducts 762 mm or more in width, apply to bottom surface:

.1 Either mechanical fasteners at approximately 450 mm centres,

.2 Or insulation adhesive applied in strips 100 mm wide on approximately 300 mm centres.

.2 Application:

.1 Cut insulation with integral vapour barrier to the required size and apply to the exterior of duct and/or plenum with vapour barrier to the warm side with horizontal surfaces overlapping the vertical surfaces and edges tightly butted together.

.2 Secure insulation with twine or wire, fastening on 300 mm centres or by insulation adhesive or mechanical fasteners (staples at 100mm).

.3 For external application of flexible insulation where the use of mechanical fasteners is unsuitable due to space limitations, wire fastenings, insulation adhesive, or other suitable method of attachment may be substituted.

.2 Cold: Apply insulation in accordance with Specification EF/2:

.1 Preparation:

.1 On round ducts and on rectangular ducts 740 mm or less in width no preparation is necessary.

.2 On rectangular ducts 762 mm or more in width, apply to bottom surface:

.1 Either mechanical fasteners at approximately 450 mm centres,

.2 Or insulation adhesive in strips 100 mm wide on approximately 300 mm centres.

.2 Application:

.1 Cut insulation with integral vapour barrier to required size and apply to warm side of ductwork with vapour barrier to the outside. Butt joints tightly together.

.2 Seal all joints with vapour barrier tape.

.3 Where mechanical fasteners penetrate the vapour barrier, apply vapour barrier tape.

.4 For external application of flexible insulation where the use of mechanical fasteners is unsuitable due to space limitations, wire fastenings, insulation adhesive, or other suitable method of attachment may be substituted.

.3 Insulation shall be secured with:

.1 100% coverage of insulation adhesive on bottom of ducts 300mm and less in width

.2 With mechanical fasteners 450mm on centre for ducts over 750mm in width

.3 All additionally secured with typing cord or wire 300mm on centre or use of mechanical fasteners.

.4 Cut off ends of mechanical fasteners and apply vapour barrier tape to totally cover fastener clips.

.3 Internal Acoustic Liner (Duct)

.1 Flexible Acoustic Duct Liner for all Outdoor Air, Supply Air, Transfer Air & Return Air Systems

.2 Provide 25-mm thick, closed-cell, moisture resistant, elastomeric acoustic duct liner with washable surface, Nomaco K-Flex Gray Duct Liner, Rubatex Insul-sheet R-1800 FS Elastomeric Insulation, AP Armaflex or approved equal.

.3 Preparation:

.1 Fix mechanical fasteners to both horizontal and vertical surfaces at approximately 300 mm centres each way.

.4 Application:

.1 Cut insulation material to required size and apply to interior of duct, edges tightly butted together.

.2 Secure insulation by impaling on mechanical fasteners. Where mechanical fasteners penetrate factory finish and at all joints, apply a seal coating.

.3 On duct systems having a 10.16 m/s to 20.32 m/s velocity, reinforce the joints with seal coating and reinforcing membrane.

.4 At internal applications of flexible liner (IF/1) where use of mechanical fasteners in unsuitable due to size of ductwork or space limitations, a one hundred percent (100%) coverage of insulation adhesive may be used..

.5 Butt joints must fit tightly.

.1 Edges must be sealed at the time of application so that the two edges are joined securely together.

.6 Provide perforated metal liner for all internally insulated ducts within 3 m of fans and for medium and high velocity ducts.

.7 Interior duct insulation shall be 100% glued to the duct.

.1 Provide mechanical fasteners 300 mm on centre with pins cut off and capped.

.8 For high velocity - provide reinforcing membrane with seal coating on all joints and metal Z bars at all leading edges of insulation.

.4 Duct Finishes

.1 Duct finishes shall be defined as follows:

BCICA Code	Type	Application
EF/2	Custom	• Use rigid insulation with an integral vapour barrier. • Adhere vapour barrier tape or adhere strips of duct insulation facing material using duct insulation facing adhesive over all joints and breaks in barrier, and at all corners. • Where mechanical fasteners penetrate duct insulation facing material, adhere vapour barrier tape or strips of duct insulation facing material with facing adhesive.
RF/3	Premium	• Use rigid insulation with an integral vapour barrier. • Adhere vapour barrier tape or adhere strips of duct insulation facing material using duct insulation facing adhesive over all joints and breaks in barrier, and at all corners. • Apply continuous metal corner bead to all corners. • Where mechanical fasteners penetrate duct insulation facing material, adhere vapour barrier tape or strips of duct insulation facing material with facing adhesive. • Apply treated canvas jacket over insulation using fabric adhesive. • Finish canvas jacket with two (2) coat of fabric coating.
RF/5	Weather Coating	• Use rigid insulation with an integral vapour barrier. • Adhere vapour barrier tape or adhere strips of duct insulation facing material using duct insulation facing adhesive over all joints and breaks in barrier and at all corners. • Apply continuous metal corner bead to all corners. • Where mechanical fasteners penetrate duct insulation facing material, adhere vapour barrier tape or strips of duct insulation facing material with facing adhesive. • Apply to the insulated surface a coat (minimum 1 litre per 1.5 m^2) of weather coating. • While still, wet, embed a layer of reinforcing membrane and finish with a final coat (minimum 1 litre per 1.5 m^2) of weather coating. • Alternately, provide a metal jacket, 0.51mm Alcan Thermoclad I.
RF/6	Liner	• Use of this finish implies that the sheet metal of the ductwork or plenum is the exposed finish.

BCICA Code	Type	Application
RD/2	Custom	• Use flexible insulation with integral vapour barrier. • At all joints and breaks apply vapour barrier tape or apply strips of duct insulation facing materials using duct-facing adhesive.
RD/3	Premium	• Use flexible insulation with integral vapour barrier. At all joints and breaks, apply vapour barrier tape or apply strips of duct insulation facing materials using duct-facing adhesive. • Apply treated canvas jacket over insulation using fabric adhesive. • Finish canvas jacket with two (2) coat of fabric coating
RD/5	Weather Coating	• Use mineral wool pipe & tank (P&T) wrap insulation with integral vapour barrier. Apply to the insulation surface a coat (minimum 1 litre per 1.5 m²) of weather coating. While still, wet, embed a layer of reinforcing membrane and finish with a final coat (minimum 1 litre per 1.5 m²) of weather coating. • Alternately, provide a metal jacket, 0.51mm Alcan Thermoclad I.

.2 **Rectangular Duct Finishes**

.1 Concealed Ducts: No further finish required.
.2 Exposed Ducts: RF/3 premium/custom alternate.
.3 Outside ductwork: RD/5.

.3 **Round Duct Finishes**

.1 Concealed Ducts: No further finish required.
.2 Exposed Ducts: RD/3 premium/custom alternate.
.3 Outside ductwork: RD/5

.5 EQUIPMENT INSULATION

.1 Provide and apply insulation to equipment in accordance with BCICA Quality Standards Specifications 1503, Equipment, as hereinafter specified and/or modified.

.2 Insulations shall be applied as follows:

Application	BICA Insulation Type	Thermal Conductivity (at 24°C)
Breeching	50mm thick, B2 –Mineral Wool or Calcium Silicate (High Temperature) Rigid Preformed Block	0.052W

.3 **Low Loss Headers, Air Dirt Separators, and Equipment Insulation Application**

.1 Hot:

.1 Apply insulation in accordance with Specification 1503-H.

.1 Apply insulation block and/or moulded pipe covering and secure firmly with mechanical, wire or strap fastenings. Insulation shall be fitted neatly to all contours without voids.

.2 Provision for air spacing behind insulation or breeching shall be supplied and installed by the breeching or smoke pipe supplier.

.2 Lay insulation blanket on radiant panels to cover completely with 300 mm overlap.

.4 **FINISHES**

.1 Fishes shall be defined as follows:

BCICA Code	Type	Application

PF/1	Premium 1	• Shell or Regular Areas:
		  • Over insulated surface, apply metal jacket.
		  • Metal Jacket: Smooth Aluminum.
		• Head or Irregular Area:
		  • Over insulate surface apply metal jacket.
		  • Metal Jacket: Smooth Aluminum.

PF/2	Premium 2	• Over insulated surface: Apply treated canvas jacket using fabric adhesive. • Finish canvas jacket with two (2) coat of canvas coating.

PF/3	Weather Coating	• Over insulated surface:
		  • Apply coat of weather coating, coverage to be as per coating manufacturer's application rate.
		  • While still wet, embed a layer of reinforcing membrane and finish with a final coat.

.2 Hot Tanks, Breechings and Equipment EF/2 Premium 2.

END OF SECTION 23 07 00

1 SCOPE OF WORK

.1 The independent specialist Commissioning Agency shall be retained to coordinate and carry out, in conjunction with the Contractor, the complete commissioning process.

.2 The individual(s) serving as the Commissioning Agent shall be independent of the work of design and construction.

.3 **The Commissioning Agency shall be retained directly by the VSB.**

.4 The Commissioning Agency shall:

.1 Review the Owner's project requirements and the basis of design
.2 Develop and incorporate commissioning requirements into the construction documents
.3 Develop and implement a commissioning plan
.4 Verify the installation and performance of the systems to be commissioned
.5 Complete a summary commissioning report

.5 Mechanical systems to be commissioned include, but are not limited to, the following systems:

.1 Drainage systems
.2 Fire protection systems
.3 Water systems
.4 Laboratory systems
.5 Compressed air system
.6 Natural gas system
.7 Fuel oil system
.8 Heating systems
.9 Cooling systems
.10 HVAC Chemical Treatment Systems
.11 Air handling and ventilation systems
.12 Noise and vibration control systems
.13 Building DDC system
.14 Lighting systems and day lighting controls

2 DESIGN REQUIREMENTS

.1 *Commissioning shall be provided on all new construction projects regardless of LEED requirements and the commissioning agent shall be retained directly by the VSB.*

~~.2 *Commissioning may also be provided on a major renovation and seismic upgrade projects and should be reviewed with the VSB project manager as to the commissioning requirements.*~~

.3 *The mechanical contractor and mechanical consultant shall take an active role in the commissioning process and shall attend all commissioning meetings, review commissioning reports and be involved in the resolution of issues identified during the commissioning process.*

.4 *The mechanical consultant shall attend all critical commissioning meetings to ensure the sequence of operation and mechanical equipment are operating as per the design requirements.*

3 SUBMITTALS

.1 Final Commissioning Report: Submit the final commissioning report outlining the implementation of the commissioning plan, copies of all start-up reports from specialty contractors and equipment manufacturers, copies of all test certificates and any other relevant forms, or information pertaining to the commissioning process.

4 DEFICIENCIES LISTED DURING COMMISSIONING

.1 Deficiencies listed by the Consultant and Commissioning Agent during the commissioning process are to be corrected by the Contractor prior to substantial completion.

5 COMMISSIONING PROCESS

.1 The commissioning process is to be performed in stages and is to include, but not be limited to the stages listed below.

.2 Stage 1: System and Equipment Readiness:

.1 Before starting up any systems or equipment, provide written verification stating that the specific system or item of equipment is ready for starting.

.2 All deficiencies shall be recorded and reviewed by the commissioning team and shall be corrected and verified prior to proceeding to the next Phase .3 Where existing systems are shut down in the course of the work, it shall be the Contractor's responsibility to replace all systems back in complete service

.3 Stage 2: Systems Start-up, Testing, Balancing, etc:

.1 All deficiencies shall be recorded and reviewed by the commissioning team, and shall be corrected and verified prior to proceeding further

.2 When this phase is complete the Commissioning Agency shall give the system and its operations a detailed inspection and testing and certify it as complete and in operation.

.4 Stage 3: Verification of Systems Operations and Performance:

.1 The Commissioning Agent shall submit all test certificates and the Commissioning Completion Certificates at the time of requesting commencement of the systems verification process.

.2 The Commissioning Agent shall draw up a schedule for the verification inspection for approval by the Consultant. The schedule shall list all the various systems, sub-systems, controls, and equipment and the estimated time period to be devoted to verifying the operation of each item. The time schedule shall take into consideration the Owner's use of the building and facilities and shall not interfere with his operations.

.3 The Commissioning Agent shall submit a complete commissioning report outlining the implementation of the commissioning plan, copies of all start-up reports from specialty contractors and equipment manufacturers, copies of all test certificates and any other relevant forms, or information pertaining to the commissioning process. Copies of all of the above shall be included in the operating and maintenance manuals.

.4 Acceptance of the mechanical systems is conditional upon performance and completion of all commissioned systems. If Substantial Performance cannot be declared for reasons of incompletion, deficiencies, or non-performance, the Owners shall not be denied the use of the building spaces or operable systems and equipment. All operable systems and equipment shall be fully maintained by the Contractor until acceptance can be declared. The warranty period for the work shall commence only upon Substantial Performance.

.5 When all of the required documents and certificates are complete and all systems and equipment are in full and satisfactory operation, the Consultant will provide a Certificate of Verification of Phase 3 and Substantial Performance may be declared.

.5 Stage 4: Demonstration of Operations and Instructions to VSB's Personnel:

.1 The Demonstration and Instruction process shall be a pre-planned scheduled process. The Commissioning Agent shall, in conjunction with the Contractor, prepare a schedule for the demonstration and instructional process. This schedule shall be reviewed and approved by the Consultant and the VSB prior to implementation

.2 The operations and maintenance requirements of all systems and equipment shall be demonstrated to the VSB's operating and maintenance personnel. This shall include the use of specialty contractors and manufacturers start-up and maintenance staff. All phases of the operations and maintenance of all items of equipment and machinery shall be demonstrated, and the operations of all systems shall be explained in detail

.3 On completion of the demonstration and instructional process obtain a signed statement of satisfaction from the VSB.

.2 Stage 5: Post Substantial Performance, Follow-up and Verification of Systems Operation:

.1 The Commissioning Agent and the Contractor shall allow for at least 2 separate 4 hour visits to the site for general trouble shooting and overseeing the operation and maintenance of all systems and equipment during the first full year warranty period following the final Commissioning and Substantial Performance Certificate being issued. These site meetings are over and above normal trouble and warranty call backs

.2 These site visits shall be scheduled for approximately 5 months and 10 months after date of Substantial Performance and shall be attended by the mechanical consultant, VSB, and control contractor.

.3 The purpose of these site visits is to investigate and trouble shoot the system operations and any problems and to ensure that all systems and equipment are being properly operated and maintained

.4 The Commissioning Agent shall be responsible for notification to all relevant contractors and/or suppliers who would be involved in the adjustment, repair, or replacement of any part of a system under warranty

.5 Following each visit to the site, the Commissioning Agent shall submit a detailed report to the Owner and to the Consultant outlining his findings at the site, any problems encountered with the operation and maintenance of all systems, and any repair work or correctional action taken and the outcome of same

END OF SECTION 23 08 00

1 GENERAL

.1 The supply and installation of natural gas piping for all natural gas fired equipment and appliances.

.2 Provide all labour, materials, products as specified, and permits as required, to accomplish this work.

2 DESIGN REQUIREMENTS

.1 All 35 kPa (5 psi) and 14 kPa (2psi) pressure gas piping which is concealed and located in plenum spaces or ceiling plenums, shall be welded, regardless of size.

.2 Gas piping distribution is not to be installed on the roof of the building other than short connections to roof mounted equipment.

3 CODES, STANDARDS AND APPROVALS

.1 Natural gas installations shall conform to the requirements of CAN/CSA B149.1HB - Natural Gas and Propane Installation Code Handbook, latest edition.

.2 Natural gas piping shall conform to ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless, ANSI/ASME B31.9 Building Service Piping, ASTM B75M - Standard Specification for Seamless Copper Tube [Metric] and ASTM B837- Standard Specification for Seamless Copper Tube for Natural Gas and Liquefied Petroleum (LP) Gas Fuel Distribution Systems.

.3 Natural gas piping fittings shall conform to ASME B16.5 - Pipe Flanges and Flanged Fittings, ANSI/ASME-B16.9 - Factory-Made Wrought Steel Butt-welding Fittings, ANSI/ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300, ANSI/ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings and ANSI/ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure

.4 Route piping installation in an orderly manner, as indicated on the drawings. Generally, follow routes parallel and perpendicular to building structure.

.5 Keep piping runs close and tight to the structure.

4 PRODUCTS

.1 NATURAL GAS PIPE

.1 Steel Pipe:

.1 To ASTM A53/A53M, Schedule 40, seamless as follows:

.1 Nominal pipe size 12mm to 50mm, screwed.
.2 Nominal pipe size 65mm and over, plain end.

.2 Underground pipe shall be Schedule 40 black steel complete with continuous bituminous coating covered with PVC “Yellow Jacket”.

.2 Joints:

.1 Nominal pipe size 12mm to 50mm, screwed.

.2 Nominal pipe size 65mm and over, continuously welded.

.3 Steel fittings:

.1 Steel pipe fittings, screwed, flanged or welded:

.2 Malleable iron: screwed, banded, Class 150.

.3 Steel pipe flanges and flanged fittings: to ASME B16.5.

.4 Welding: butt welding fittings.

.5 Unions: malleable iron, brass to iron, ground seat, to ASTM A47/A47M.

.6 Bolts and nuts: to ASME B18.2.1.

.7 Nipples: schedule 40, to ASTM A53/A53M.

.8 Copper pipe fittings, screwed, flanged or soldered:

.1 Cast copper fittings: to ASME B16.18.
.2 Wrought copper fittings: to ASME B16.22.

.9 Plastic Pipe (Medium or High Density Polyethylene)

.1 Plastic pipe shall be used for buried, underground applications only. The pipe shall not be encased in concrete or installed indoors.
.2 The pipe shall be bright yellow in colour.
.3 Plastic pipe may be used for underground applications up to a nominal pipe size of 50mm.

.1 Above 50mm, steel pipe shall be used.

.4 The pipe shall be manufactured from medium-density or high-density polyethylene that conforms to ASTM D2513 standards.

.1 ASTM certification shall be clearly indicated along the entire length of the pipe at one (1) meter intervals.

.5 Pipefittings shall be manufactured from medium-density polyethylene that conforms to ASTM D2513 standards.

.1 All fittings shall be fusion welded. Fitting and joint fusion welding shall be completed by a factory trained and certified installer. Fusion welding can be accomplished by the following methods:

.1 Socket fusion,
.2 Butt fusion,
.3 Electrofusion

.2 Installed pipefittings must be manufactured for and be compatible with the style of fusion welding used to connect piping.

.3 Compression style fittings shall NOT be accepted.

.6 The installing contractor and installing personnel shall be factory trained and certified.

.2 WELDING

.1 Pipe size 50 mm (2") and smaller shall be oxyacetylene gas welded. Pipe size 65 mm (2½") and larger shall be electric arc welded. All welds shall be multiple pass. The ends of all pipes to be jointed by welding shall be machine cut, properly and cleanly bevelled, and properly spaced to ensure the uniformity of the weld throughout the entire joint.

.2 Welding materials and labour must conform to ASME Code and the Provincial requirements. Field welding in general shall be in accordance with Current Edition of ASME/ANSI B31.9.

.3 Use B welders fully qualified and Licensed by Provincial Authorities.

.3 PIPE HANGERS

.1 Provide galvanized steel, continuous threaded hanger rods.

.2 Provide a galvanic break between copper piping and steel pipe hangars.

.3 Provide seismic controls, as required, for all fuel oil piping. Refer to the section "VIBRATION AND SEISMIC CONTROL FOR PIPING AND EQUIPMENT" for requirements.

.4 Install hangers for steel pipe with a maximum separation as indicated in table below and where required elsewhere to avoid sag in pipe installation. Provide sheet metal shields to protect insulation from being crushed at hanger locations.

PIPE DIAMETER	ROD DIAMETER	STEEL
Up to 19mm	10mm	1.8m
25mm to 32mm	10mm	2.4m
38mm to 50mm	10mm	3.0m
65mm to 75mm	13mm	3.6m
100mm to 130mm	16mm	3.6m

.5 Inserts

.1 Insert shall be malleable iron case or galvanized steel shell with expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms.

.2 Size inserts to suit threaded hanger rods.

.3 Cast-in-place concrete insert shall be galvanized malleable iron or steel Grinnell Fig 281 or Fig 282 or Unistrut.

.4 All concrete inserts and anchors shall be ICC-ES approved and certified by an ICC-ES evaluation report under ICC-ES "Division 03 16 00 – Concrete Anchors". Use only ICC-ES design load ratings.

.4 BALL VALVES

.1 Provincial Code approved, lubricated ball type.

.5 CATHODIC PROTECTION

.1 Supply cathodic protection for buried steel piping in accordance as specified.

.2 Cathodic protection measure to conform to NACE standards.

.1 Cathodic protection shall conform to the cathodic protection standards as developed by NACE SP0169.

.1 Use the sacrificial anode method of protection if soil resistivity is less than 3000 Ω cm.

.1 Assume 3% bare pipe and cathodic protection circuit current of 22 mA/m2 for calculating the size of the anode.

.2 Use magnesium anodes for the steel pipe.

.3 Use the impressed current method where soil resistivity is greater than 3000 Ω cm.

.2 Test final installation and make required system modifications as required to conform to the standard.

5 EXECUTION

.1 INSTALLATION

.1 Ream pipes and tubes. Clean off scale and dirt, inside and outside, before assembly. Remove welding slag or other foreign material from piping.

.2 All threads shall be standard, clean cut, and tapered to ANSI B1.20.1. Threaded joints shall be made up using approved type thread lubricant applied to the male thread only. Thread lubricant shall be suitable for the service and temperature and shall be a type that does not set up hard under service.

.3 Entirely avoid air and water pockets in piping. All run-outs shall be installed with swing joints to allow for movement due to expansion and contraction of the main.

.4 All pipes shall be welded with long radius Tube Turn elbows and factory manufactured "T" connections.

.5 Where branch lines are connected to mains two or more sizes larger, the branch may be cut into the pipe. Where branch pipes are welded to mains without the use of "T" connections, torch-cut openings may be cut through, beveled, and filed smooth. Branch pipes must not be cut large enough to permit entry by welding metal and slag within the pipe.

.6 Underground gas piping shall be to the requirements of the Provincial Gas Inspector complete with cathodic protection, welded, and Shaw-Yellow Jacket No. 1 covered.

.7 All underground gas piping shall be identification traced with 75 mm (3”) wide Terra Tape. Tape shall be labelled “CAUTION GAS LINE BURIED BELOW” at 750 mm (30”) intervals. Tape shall run continuous above the gas line. Tape shall be laid in the trench during backfill and shall be located above the pipe approximately 250 mm (10”) below grade.

.8 Isolating unions shall be installed at all meter connections, wherever piping rises above grade, and wherever called for by the BC Gas Code.

.9 All exposed piping that is located where it may be subject to damage from vehicle traffic shall be guarded. Guards shall be fabricated from structural steel securely anchored to the building or shall consist of heavy galvanized steel pipe posts anchored in concrete in the ground.

.10 All piping passing through roofs shall be fitted with 5 lb lead roof flashings and caulked weathertight.

.11 All piping shall be installed so that it will in no way be strained or distorted by expansion or building or equipment movement.

.2 CONNECTIONS

.1 All underground connections to be welded.

.2 Screw joint steel piping up to and including 40mm. Weld piping 65mm and larger including branch connections. Screw or weld 50mm piping.

.3 Make screwed joints with full cut standard taper pipe threads with approved non-toxic compound applied to male threads only.

.4 Use main sized saddle type branch connections or directly connected preformed branch connections in steel pipe provided that main is at least one size larger than branch up to 150mm mains and main is at least two sizes larger than branch for 200mm and larger main. Do not project branch pipes inside the main pipe.

.5 Make connections to equipment and branch mains with unions.

.6 Provide non-conducting type connections wherever jointing dissimilar metals in systems. Brass adapters and valves are acceptable.

.7 Provide unions at all connections to equipment, control, valves, etc.

.8 Make connections to equipment relief connections and pipe to outside to a safe location above roof. Anchor piping and allow for possible expansion.

.3 ROUTE AND GRADES

.1 Route piping in orderly manner and maintain proper grades. Install to conserve headroom and interfere as little as possible with use of space.

.2 Run exposed piping parallel to walls.

.3 Group piping wherever practical at common elevations.

.4 Install concealed pipes close to the building structure to keep furring to a minimum.

.4 INSTALLATION

.1 General

.1 Manufacturer's Instructions:

.1 Comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

.2 Install piping to allow for expansion and contraction without unduly stressing pipe or equipment connected. Also, refer to Section 23 05 48 for the provisions of flexible connections in piping systems. Pay particular attention to piping running horizontal across expansion joints and provide adequate expansion and contraction for all such piping.

.3 Provide clearance for proper installation of insulation and for access to valves and unions.

.4 Yellow jacket buried gas lines; prime coat and paint lines exposed to outdoors.

.5 Avoid any piping in exterior walls unless otherwise directed. If required, install this piping protected from the outside by the building insulation and on the warm side of the vapour barrier.

.6 Keep all piping free from scale and dirt. Protect open pipe ends whenever work is suspended during construction, using temporary plugs, burlap, or other approved material. Flush out piping systems before making final connections.

.7 Pipe risers made of steel pipe shall use piping with welded joints and fittings. Riser clamps shall be welded to pipes.

.8 Minimum pipe and hand valve connections to radiation shall be 20 mm.

.9 Bullhead tees shall not be used for converging flows.

.10 Provide seismic restraints for all piping in accordance with the ASMACNA Guidelines for the Seismic Restraints of Mechanical Systems and Plumbing System".

.11 Provide fire stopping and smoke seals for piping at penetrations of all fire and smoke rated separations; see clauses 11.2 and 12.6 of Section 23 07 00 HVAC Insulation for fire stopping details.

.12 Install drip points:

.1 At low points in piping system.

.2 At connections to equipment.

.2 Underground Installation:

.1 Steel Piping

.1 All piping underground piping shall be complete with yellow-jacket protective coating.

.2 All welded joints shall be sealed weather tight and be:

.1 Painted with a rust inhibitor,

.2 Wrapped in butyl rubber tape.

.1 Each wrap of the tape should overlap the underlying wrap by a minimum of 30% of the tape's width.

.3 Have a final coating of PVC tape.

.1 Each wrap of the tape should overlap the underlying wrap by a minimum of 30% of the tape's width.

.3 Cathodic Protection:

.1 The piping shall be cathodically protected.

.2 Cathodic protection shall conform to the cathodic protection as indicated in the NACE SP0169 standard.

.1 Use the sacrificial anode method of protection if soil resistivity is less than 3000 Ω cm.

.1 Assume 3% bare pipe and cathodic protection circuit current of 22 mA/m^2 for calculating the size of the anode.

.2 Use magnesium anodes for the steel pipe.

.2 Use the impressed current method where soil resistivity is greater than 3000 Ω cm.

.3 Test final installation and make required system modifications as required to conform to the standard.

.1 Testing to conform to NACE standards.

.2 Plastic Piping

.1 Polyethylene (PE) gas piping shall be installed outside, underground only. PE is not approved for indoor use or for encasement in concrete.

.2 Underground gas piping shall be installed with sufficient clearance from any other underground structure to avoid contact, to allow maintenance, and to protect against damage from proximity to other structures.

.3 In addition, underground plastic piping shall be installed with sufficient clearance, or shall be insulated from any source of heat to prevent heat from impairing the serviceability and reliability of the pipe.

.4 Careful attention should be paid to layout and routing to prevent excessive stressing of the piping where there is heavy vehicular traffic, or soil conditions are unstable and setting of piping could occur. Secondary steel conduit may be used for additional protection.

.5 Piping shall be protected from physical damage where it passes through flowerbeds, shrub beds, and any other cultivated areas where damage is reasonably expected.

.6 Piping shall be buried or covered in a manner so as to protect the piping from physical damage and in accordance with the following guidelines.

.7 Cover Requirements – Underground piping systems shall be installed with at least 600mm of coverage.

.8 Trenches – The trench shall be graded so that the pipe has a firm, substantially continuous bearing on the bottom of the trench. It should also be free of rocks and debris that would abrade the PE piping. This may require additional material such as loom, topsoil or sand to create a level surface.

.9 Backfilling – Where flooding of the trench is done to consolidate the backfill, care should be exercised to see that the pipe is not floated from its firm bearing on the trench bottom.

.10 An electrically continuous corrosion-resistant tracer wire (minimum AWG 14) or magnetic tape shall be buried with the polyethylene pipe to facilitate locating. One end shall be brought above the ground at a building wall or riser. The wire or tape shall not be in direct contact with the polyethylene pipe.

.11 The maximum allowable pressure test shall be 150 psi and the maximum continuous pressure shall be 60 psi.

.5 TESTING

.1 Tests on natural gas systems shall consist of a hydraulic test of 1050 kPa (150 PSIG) for 24 hours with no loss of pressure.

.1 Testing of polyethylene piping distribution systems shall be pressure tested up to 1050 kPa (150 PSIG) for one (1) hours and a continuous test of 415 kPa for 24 hours.

.2 Testing shall be witnessed and signed off by the by the Commissioning Agent.

END OF SECTION 23 11 23

1 GENERAL

.1 This section contains material and product specifications for HVAC piping, fittings and valves includes the following systems.

.1 Heating water supply and return systems
.2 Chilled water supply and return systems
.3 Glycol water supply and return systems
.4 Refrigerant piping systems

1 DESIGN REQUIREMENTS

~~1. *Any variation from the specified piping/fittings and valve standards shall be approved by VSB prior to tender of the project.*~~ .

2. *Mechanical grooved piping systems of any kind are not approved for HVAC installations except for sprinkler systems.*

3. *"Press Fit", "Sure-joint" "Victaulic" or "Shark-bite" piping systems are* **NOT** *approved for any HVAC installations.*

4. *Plastic piping systems are not approved for any HVAC or unburied installations with exception of trap primer water feed and high efficiency boiler condensate piping.*

5. *Butterfly valves are not approved for installation in any HVAC or plumbing systems.*

2 PRODUCTS

.1 HEATING AND CHILLED WATER PIPING

SERVICE	MATERIAL
Heating Water Piping (to 121°C)	Schedule 40 black steel (10mm wall for sizes 300mm and larger) ASTM Specification A53, Grade B Type "L" hard drawn copper.
In-slab Hydronic Piping (radiant heating only)	**Not permitted**
Chilled Water Piping	Schedule 40 black steel (10mm wall for sizes 300mm and larger) ASTM Specification A53, Grade B Type "L" hard drawn copper.
Glycol Water Piping	Schedule 40 black steel (10mm wall for sizes 300mm and larger) ASTM Specification A53, Grade B Type "L" hard drawn copper.
High Efficiency Boiler Condensate	Schedule 40 PVC
Equipment Relief Piping	Schedule 40 black steel

.2 HEATING AND CHILLED WATER PIPING FITTINGS

SERVICE	MATERIAL	JOINT
Heating Water Piping (to 121°C)	Schedule 40 black steel (< 75mm)	Threaded.
Heating Water Piping (to 121°C)	Schedule 40 black steel (=> 75mm), Same thickness as pipe.	Welded
Heating Water Piping (to 121°C)	Wrought copper, cast brass.	95 – 5 Solder (Flare)
Chilled and Glycol Water Piping	Schedule 40 black steel (< 75mm)	Threaded.

SERVICE	MATERIAL	JOINT
Chilled and Glycol Water Piping	Schedule 40 black steel (=> 75mm), Same thickness as pipe.	Welded
Boiler Condensate	Schedule 40 CPVC	Solvent Weld.
Equipment Relief Piping	Schedule 40 black steel	Threaded.
In-slab Hydronic Piping	PEX	SSC (Stainless Steel Clamp to ASTM F2098)

.3 SWING CHECK VALVES

.1 National pipe size 2 and under, soldered:

.2 National pipe size 2 and under, screwed:

.3 National pipe size 2 1/2 and over, flanged:

.4 BALL VALVES

.1 National pipe size 2 and under, screwed:

.2 National pipe size 2 and under, soldered:

.3 National pipe size greater than 2, flanged:

.5 BALANCING VALVES

.1 Balancing valves shall be installed on all hydronic circuits as indicated on the mechanical drawings.

.2 The balancing valve shall have memory stop positioning allowing the valve to be closed and returned to the original balanced position.

1 EXECUTION

.1 GENERAL:

.1 ROUTE AND GRADES

.1 Route piping in orderly manner and maintain proper grades. INSTALL TO CONSERVE HEADROOM and interfere as little as possible with use of space. Run exposed piping parallel to walls.

.2 Slope piping and arrange to drain at low points.

.3 On closed system:

.1 Equip low points with 20 mm drain valves and hose nipples.

.2 Provide, at high points on lines and on equipment connections, collecting chambers and high capacity float operated manual air vents.

.4 Provide automatic air vents at all high points.

.5 Runouts and branch lines to radiation, equipment, risers, stubs, etc., shall have a uniform grade of 25 mm (1") in 600 mm (24"). Water branches shall be taken off the top or bottom of the mains, as required to suit up feed or down feed connections, at an angle of 45 degrees or 90 degrees.

.2 INSTALLATION

.1 Install piping to allow for expansion and contraction without unduly stressing pipe or equipment connected.

.1 Make provisions to provide flexible connections in piping systems.

.2 Provide clearance for proper installation of insulation and for access to valves, air vents, drains and unions.

.3 All pressure services cap-offs for future shall be provided with valves.

.4 Avoid locating water and drain piping over electrical equipment.

.5 Avoid piping in exterior walls unless otherwise directed.

.6 Terminate equipment relief piping 2400 mm above roof or at a safe location subject to the review of the Consultant.

.7 Make connections to all equipment drains, drain pans, and ductwork drains.

.8 Pipe risers made of steel pipe shall use piping with welded joints and fittings.

.9 Piping must not be installed in outside walls or unheated areas.

.10 Avoid the use of "Permatex" or other joint compounds which will harden over time.

.11 All welding shall be performed in accordance with the requirements of the BC Boiler Inspection Branch and ASME B31.1, Power Piping. Welding shall only be carried out by skilled pipe welders who have passed BC Boiler Inspection pipe welding tests and who hold current welding certificates for the work being performed.

.12 All pipe welding shall be carried out using approved pipe welding procedures. Pipe size 50 mm (2") and smaller shall be oxyacetylene gas welded or electric arc welded. Pipe size 65 mm (2½") and larger shall be electric arc welded. The ends of all pipe to be joined by welding shall be machine cut or neatly and cleanly torch cut to a neat and accurate bevel. All joints shall be properly spaced to ensure the uniformity of the weld throughout the entire joint. All welds shall be multiple pass type. Welding rod diameter and type, and the number of passes required shall be in accordance with recognized and approved welding practice and the requirements of A.S.M.E. and the BC Boiler Inspection Branch. In general, for piping up to size 100 mm (4") diameter the minimum number of passes shall be three and for piping size 125 mm (5") to 300 mm (12") diameter the minimum number of passes shall be four. On completion of each pass, all welds shall be thoroughly cleaned of dirt and slag by chipping hammer and wire brush prior to the next pass being laid. The final cover pass shall be cleaned, chipped, and wire brushed to finish. All flanges shall be face and back welded.

.13 All pipe nipples shall be sufficient length for the proper sized pipe wrench to be used. No close or running nipples shall be used. All pipe nipples shall be extra heavy weight black steel pipe.

.14 Where water mains are reduced in size at down feed or side takeoffs, eccentric reducers shall be used with the straight side on top. Where steam mains are reduced in size, eccentric reducers shall be used with the straight side on the bottom.

.15 Standard wrought steel ANSI welding tees shall be used for branch takeoffs on size 65 mm (2 ½") and larger pipe runs for branch takeoffs down to one-half the diameter of the main. Branch takeoffs less than one-half the diameter of the main shall be made using Weldolet or Threadolet fittings.

.16 Gaskets shall be ring type for 1034 kPa (150 psi) class service, Cranite, or approved, 1.6 mm (1/16") thick.

.17 The following piping configurations and piping fittings will not be allowed on this project: bull headed tees, bushings, street elbows, close or running nipples, thread protection couplings, screwed plus, crosses, return bends, dresser couplings, self-aligning slip couplings, flexible joints, and drilled and tapped pipe connections.

.18 DRAINS

.1 Install 20 mm (3/4") hose drains at each low point in the system to permit complete drainage. Access panels shall be provided to all drain valves located concealed in walls or ceilings. All drain valves are not necessarily shown on the drawings.

.2 Install 20 mm (3/4") hose drains immediately down stream of each main zone shutoff valve at the flow and return headers in the boiler room to allow drainage of an isolated zone.

.3 Install 20 mm (3/4") hose drains immediately down stream of each set of zone or subzone isolating shutoff valves located in mains, submains and branch mains to allow drainage of all isolated sections of piping.

.4 In the boiler room all drains, blow offs, and overflow lines shall be piped to floor drains.

.5 Install a 50 mm (2") valved drain at the low point in the return header in the boiler room for flushing the system. This shall be in addition to the required hose drain. It shall be fitted with an elbow and nipple and cap on the valve outlet to direct the flow of water.

.6 All piping drains, and all boiler room, fan room, and equipment room drains, etc. shall be fitted with 20 mm (3/4") bronze screwed ball type drain valves complete with lever handle, hose outlet, hose cap and chain, Red-White No. 5046.

.7 All auxiliary drains in convectors, wall fin, unit heater booster coils, etc. shall be fitted with 20 mm (3/4") bronze screwed hose bibs with wheel handle, hose outlet, and brass hose cap with chain, Emco No. 10241.

.8 Condensate drains from cooling coil drain pans shall be trapped and piped for the dip pan to the nearest accessible floor drain. Drains shall be minimum size 32 mm (1 ¼") copper piping and shall be complete with cleanouts as required.

.9 No drain or overflow shall discharge onto any floor or roof.

.3 HVAC VALVES

.1 Valves shall be Crane, or approved for minimum 860 kPa (125 psi) steam service. Jenkins, or Red & White, of equal specifications are approved. All valves used on the project shall be the same manufacturer.

.2 Each valve shall have the make, size, and working pressure stamped or cast into the valve body. Each valve shall have the make and model number located on an identification plate securely fastened to the valve handle.

.3 Valves shall be installed where shown on the drawings and where called for in this specification. Not all valves are shown on the drawings.

.4 Gate Valves: - Use for shutoff service and as called for:

1. Not acceptable for 50 mm (2") and smaller.

2. Size 65 mm (2 ½") and larger, iron body bronze trim flanged pattern N.R.S.
   - Crane No. 461
   - Jenkins No. 452
   - Red-White No. 415E

3. Size 65 mm (2 ½") and larger, iron body bronze trim flanged pattern O.S.&Y.
   - Crane No. 465
   - Jenkins No. 454
   - Red-White No. 421E

.5 Globe Valves: - Use for throttling, regulating, or bypass service, and as called for:

1. Size up to 50 mm (2") bronze screwed composition disc.
   - Crane No. 7
   - Jenkins No. 106B
   - Red-White No. 221

2. Size 65 mm (2 ½") and larger, iron body bronze trim flanged pattern.
   - Crane No. 351
   - Jenkins No. 2342
   - Red-White No. 400A

.4 AIR VENTS

.1 On the return end of each convector, wall fin, horizontal unit ventilator, zone booster coil, fan coil, and VAV box coil type heating element, furnish and install a 20 mm (3/4") diameter by 150 mm (6") long air chamber and fit with a Dole No.20 air vent with screw driver operator. Pipe vents up to the front of the cabinets so that they may be operated through a hole drilled in the cabinet or through the cabinet grille.

.2 All high points in fluid piping systems, heating coils, vertical unit ventilator coils, cooling coils, unit heaters etc., shall be fitted with automatic air vents, whether shown on the drawing or not. Automatic air vents shall be Hoffman No.79 (75 psi W.P.), or approved for systems with working pressures up to and including 345 kPa (50 psi). Automatic air vents shall be Hoffman No.78 (150 psi W.P.), or approved, for systems with working pressures up to and including 1034 kPa (150 psi). Install a 20 mm (3/4") ball valve on the system side of each air vent and run a 6 mm (1/4") copper drain line away from each vent to drain. If the unit ventilator is installed at the high point in the heating system, it shall be provided with an automatic air vent.

.3 Access panels shall be provided for all air vents located concealed in walls, ceilings, shafts, etc.

END OF SECTION 23 20 00

1 DESIGN REQUIREMENTS

.1 Pumping power is a significant component of the overall energy consumption in the building. Selecting the type of pumps shall be a part of the overall strategy to meet the energy conservation targets for the project.

.2 Using pumps with integrated Variable Speed Drives and 2-way control valves for hydronic systems where flow variations can be used to reduce pump horse power during regular operation shall be considered.

.3 The Consultant shall consider using de-centralized pumping systems with smaller pumps and injection pumps in lieu of large primary pumping systems for better control and energy performance.

.4 All pumping systems shall be provided with duty/standby sizing for 100% redundancy, 50% redundancy is not acceptable.

.5 A choice between two types of pumping equipment shall be made for the project:

.1 For pumps of 75 gpm or greater they shall be Armstrong line of pumps, vertical in-line pumps and all operating at 1750 RPM or lower. Variable speed control for larger pumps shall be separate from the pump and not integrated.

.2 For pumps less than 75 gpm either Armstrong single-speed wet rotor or Grundfos line of pumps with integrated Variable Speed Drives (Magna 3) or three-speed pumps.

.6 All pumps should be located within mechanical room spaces and either floor or wall mounted. No pumps installed in the ceiling space or higher than 1500mm above finished floor will be acceptable.

.7 Ensure that there is adequate access space between pumps for servicing of motor, strainer, valves and other components. Avoid pumps being installed above each other.

.8 Pump speeds above 1750 RPM such as 3600 RPM is not permitted.

.9 Pumps shall be selected on pump curve to have sufficient horsepower and be non-overloading at dead head flow rate.

.10 Balancing valves on pumps shall not be used for balancing flow rate by more than 10%. Impellers shall be trimmed to provide specified head pressure and flow performance requirements.

1 PRODUCTS

.1 GENERAL

.1 Pumps specified to be complete with built-in variable speed drives. Larger pumps with remote drives shall:

.1 The drive shall be shipped with correctly sized load and line reactors. Reactors. The motors shall be invertor duty motors.

.2 IN-LINE, WET ROTOR CIRCULATING PUMPS

.1 The pump shall have a cast iron body, no mechanical seals, no lubrication, stainless steel shaft, ethylene propylene gaskets, impedance protected motor.

.3 CLOSE-COUPLED IN-LINE VERTICAL PUMPS

.1 The pump shall have the following features:

.1 Easy to service. A radially split casing permits removal of the motor and pump rotating assembly, without removing the pump casing from the line.

.2 Easy removal of complete pump from the line when necessary, due to companion flanges, supplied with the pump.

.3 Inside type mechanical seal with Silicon carbide seat, serviceable without breaking pipe connections.

.4 Flush and vent connection removes entrained air and ensures liquid at seal face at all times.

.5 Equal suction and discharge connections result in simplified piping design and installation.

.6 Inside type mechanical seal with Silicon carbide seat, serviceable without breaking pipe connections.

.7 Heavy cylindrical bracket with 360° register on both flanges provides a rigid union of pump and motor.

.8 Dynamically balanced impeller.

.9 Separate tapped openings for gauge, flush and drain connections.

.4 IN-LINE CIRCULATING PUMPS

.1 Pump shall be iron body with bronze fitted construction, three-piece design featuring the shaft and bearing module which shall fit all models S-25 through S-57 and H-32 through H-54.

.2 The shaft shall have an integral thrust collar and shall be oil-lubricated bronze sleeve bearings.

.3 Pump to be equipped with a water-tight, long-life mechanical seal and be suitable for 862 kPa working pressure.

.4 The pump shall have the following features:

.1 Built using a standard three-piece design that features:

.1 A radially-split split body,
.2 Oversized shaft,
.3 Centrifugal impeller,
.4 Positive mechanical seal
.5 Modular construction.

.2 Balanced, centrifugal-design impeller to ensure maximum water delivery.

2 EXECUTION

.1 INSTALLATION

.1 Provide line sized gate valve and strainer on suction and line sized soft seated check valve and memory stop balancing valve on discharge.

.2 Decrease from line size, with long radius reducing elbows or reducers. Support piping adjacent to pump such that no weight is carried on pump casings. Provide support under elbows on pump suction and discharge line sizes 100 mm and over.

3 DEMONSTRATION AND TRAINING

.1 Include for on-site demonstration and training session for all pumps equipped with Variable Speed Drives. The training is to be a full review of all components including, but not limited to, a full operation and maintenance demonstration, abnormal events and interface to the building DDC system.

END OF SECTION 23 21 23

1 GENERAL

.1 This section contains information related to the piping and fittings for refrigerant based air-conditioning systems.

2 DESIGN REQUIREMENTS

.1 The project shall avoid the use of ozone depleting refrigerants regardless of LEED project requirements.

.2 The use of refrigerant piping is to be limited to stand alone split system air-conditioning units for server rooms and other areas requiring spot cooling.

.3 The use of VRF systems for HVAC is not acceptable ~~without prior approval from the VSB~~.

.4 Avoid long lengths of refrigeration piping in the ceiling space and all condensing units to be installed within 50 feet of evaporator where possible.

.5 All refrigeration piping is to be insulated and protected from damage. All exterior piping to be provided with aluminum jacket in addition to closed cell insulation.

.6 Refrigeration systems to be monitored by the DDC system.

3 PRODUCTS

.1 REFRIGERATION PIPING

SERVICE	MATERIAL
Refrigeration Piping	Copper Tube Type ACR to ASTM B280 with minimum wall thickness as per CSA B52 refrigeration code.

.2 FITTINGS

SERVICE	MATERIAL	JOINT
Refrigeration Piping	Brass, ACR Copper	Brazing, silver solder, flared bronze or brass fittings.

.3 REFRIGERATION VALVES

.1 22 mm and under: Class 500, 3.5 Mpa, globe or angle non-directional type, diaphragm, packless type, with forged brass body and bonnet, moisture proof seal for below freezing applications, brazed connections.

.2 Over 22 mm: Class 375, 2.5 Mpa, globe or angle type, diaphragm, packless type, back-seating, cap seal, with cast bronze body and bonnet, moisture proof seal for below freezing applications, brazed connections.

4 EXECUTION

.1 INSTALLATION

.1 Install piping to allow for expansion and contraction without unduly stressing pipe or equipment connected.

.2 Make provisions to provide flexible connections in piping systems.

.3 Provide clearance for proper installation of insulation and for access to valves.

.4 All work shall be completed by certified refrigeration trades licensed to operate in British Columbia.

.5 Install in accordance with British Columbia Refrigeration Code and the local authority having jurisdiction.

.6 Bend without crimping or constriction.

.7 Hot gas lines:

.1 Pitch at least 1:240 down in direction of flow to prevent oil return to compressor during operation.

.2 Provide trap at base of risers greater than 2400 mm high and at each 7600 mm thereafter.

.3 Provide inverted deep trap at top of risers.

.4 Provide double risers for compressors having capacity modulation.

.1 Large riser: install traps as specified.

.2 Small riser: size for 5.1 m/s at minimum load. Connect upstream of traps on large riser.

.2 PRESSURE AND LEAK TESTING

.1 Close valves on factory charged equipment and other equipment not designed for test pressures.

.2 Leak test to CSA B52 before evacuation to 2MPa and 1MPa on high and low sides respectively.

.3 Test Procedure:

.1 Build pressure up to 35 kPa with refrigerant gas on high and low sides.
.2 Supplement with nitrogen to required test pressure.
.3 Test for leaks with electronic or halide detector.
.4 Repair leaks and repeat tests.

.3 FIELD QUALITY CONTROL

.1 Site Tests/Inspection:

.1 Close service valves on factory charged equipment.

.2 Ambient temperatures to be at least 13°C for at least 12 hours before and during dehydration.

.3 Use copper lines of largest practical size to reduce evacuation time.

.4 Use two-stage vacuum pump with gas ballast on 2nd stage capable of pulling 5Pa absolute and filled with dehydrated oil.

.5 Measure system pressure with vacuum gauge. Take readings with valve between vacuum pump and system closed.

.6 Triple evacuate system components containing gases other than correct refrigerant or having lost holding charge as follows:

.1 Twice to 14 Pa absolute and hold for 4 h.

.2 Break vacuum with refrigerant to 14 kPa.

.3 Final to 5 Pa absolute and hold for at least 12 h.

.4 Isolate pump from system, record vacuum and time readings until stabilization of vacuum.

.7 Charging:

.1 Charge system through filter-drier and charging valve on high side. Low side charging not permitted.

.2 With compressors off, charge only amount necessary for proper operation of system. If system pressures equalize before system is fully charged, close charging valve and start up. With unit operating, add remainder of charge to system.

.3 Re-purge charging line if refrigerant container is changed during charging process.

END OF SECTION 23 23 00

1 GENERAL

.1 This section contains specification information on water treatment and devices for the chemical treatment and filtration of heating and other hydronic systems.

1 DESIGN REQUIREMENTS

~~.1~~ ~~*The chemical water treatment for renovation/addition/upgrade projects shall match the existing chemical treatment in the existing building's hydronic system. Consult with VSB representative.*~~

.2 Provide chemicals sufficient for maintenance during the warranty period of the hydronic system.

.3 All new ~~and existing~~ systems, ~~which are connected to,~~ shall be flushed a minimum of 3 times or until clean.

*.4 Approved manufacturer for chemical treatment shall be **Pace Chemicals.***

2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 23 05 00 Common Work Results For HVAC – Submittal Requirements.

3 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for the equipment for incorporation into the manuals specified in accordance with Section 23 05 00 Common Work Results For HVAC.

- .1 Reports:
  - .1 Pipe cleaning and treatment.
  - .2 Water treatment (chemical analysis) report records.
    - .1 Provide separate, signed sealed report for each water analysis completed through the construction and warranty periods.
  - .3 Volumetric report of piping systems:
- .2 Materials List:
  - .1 Treatment chemicals
  - .2 Analysis chemicals
  - .3 Analysis tools
- .3 List indicating manufacturer recommended service tasks and service intervals.

4 QUALITY ASSURANCE

.1 Health and Safety:

- .1 Complete the work following all occupational health and safety requirements in accordance the regulations.

.2 The water treatment chemicals and treatment process shall be supplied and performed by the Contractor.

.3 The work shall be supervised by a the Water Treatment Specialist who, upon completion, shall certify that the process is satisfactory and submit a report outlining the cleaning operation, the treatment process, and the current water chemistry.

5 PRODUCTS

.1 MANUFACTURER

.1 Equipment, chemicals, service provided by one supplier.

.2 POT FEEDER

.1 Bypass pot feeder shall be shell and head constructed out of 11-gauge steel. The cap shall be a quick opening cap constructed of cast iron complete with a Buna N seal ring.

.2 The corrosion coupon holder shall be stainless steel.

.3 Provide isolating valves on the inlet, outlet, and drain valves.

.3 GLYCOL FEED SYSTEM

.1 The system shall be an automatic feed system Axiom model SF-100 or equivalent.

.1 Provide alarm contacts for connection to the DDC system.

.4 CLEANING CHEMICALS

.1 Use a Sodium Metasilicate, Sodium Nitrite and a wetting agent compound, which in solution removes grease and petroleum products.

.2 The Water Treatment Specialist shall determine the cleaning chemical concentration level.

.5 TREATMENT CHEMICALS

.1 Provide sufficient chemicals to treat the system from the time of commissioning to acceptance of the building.

.1 In addition, provide a stock of chemicals, filters and corrosion coupons suitable for normal operation for the duration of the warranty period of 2 years.

.6 WATER TREATMENT FOR HYDRONIC SYSTEMS

.1 Hot water heating system: pot feeder, 19 L, operating pressure 1200 kPa.

.2 Chilled water system: pot feeder, 19 L, operating pressure 1200 kPa.

.3 Glycol system: pot feeder, 19 L, operating pressure 1200 kPa.

.4 Side Stream Micron filter:

.1 Install a micron filter:

.1 At each pot feeder location.

.2 On the incoming heating water and chilled water lines in every major mechanical room.

.2 Capacity 2% of pump recirculating rate at operating pressure.

.3 Six (6) sets of filter cartridges for each type, size of micron filter.

.4 Filters shall be rated for the maximum operating temperature of the medium being filtered.

.5 Filters shall be a minimum of 76cm long.

.1 Provide a sight flow indicator at each feed water and micron filter location.

.7 TEST EQUIPMENT

.1 Provide one set of test equipment for each system to verify performance.

.2 Complete with carrying case, reagents for chemicals, specialized or supplementary equipment.

6 EXECUTION

.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

.2 INSTALLATION

.1 Install HVAC water treatment systems in accordance with ASME Boiler Code Section VII, and requirements and standards of authorities having jurisdiction, except where specified otherwise.

.2 Ensure adequate clearances to permit performance of servicing and maintenance of equipment.

.3 Provide isolation, bypass, and drain valves on all pot feeder and side stream micron filter installations.

.4 Pipe all pot feeder and side stream filter drain lines to nearest floor drain.

.3 CHEMICAL FEED PIPING

.1 Install crosses at changes in direction. Install plugs in unused connections.

.4 CLEANING OF MECHANICAL SYSTEM PIPING AND WATER TREATMENT

.1 Provide copy of recommended cleaning procedures and chemicals for approval by Consultant.

.2 On completion of the installation of the mechanical piping systems, **all new systems** shall be chemically cleaned.

.3 Cleaning shall be supervised by the Water Treatment Agency and shall be witnessed by the Consultant and the Commissioning Agency.

.4 Install totalizing water meter(s) and record capacity in each system.

.5 After all components of the piping system have been pressure tested and proven to be in full operational condition and leak free, flush entire system with fresh, clean make-up water to remove loose mill scale, sediment and construction debris.

.6 During cleaning and flushing:

.1 All 3-way valves shall be positioned to 50% open.

.2 All 2-way valves shall be positioned to 100% open.

.3 The flushing of the system shall occur 3 times and until the systems runs clear.

.7 All strainer baskets shall be removed, cleaned, and replaced.

.8 Add cleaner to closed systems at concentration levels recommended by the Water Treatment Specialist.

.9 For hot water heating systems:

.1 Apply heat while circulating, raise temperature slowly to 70°C and maintain at 70°C for minimum of 12 hours.

.5 WATER TREATMENT SERVICES

.1 Provide water treatment monitoring and consulting services for the duration of the warranty period. ~~Service to include:~~

END OF SECTION 23 25 00

Sustainability Goals

1. *During construction comply with the recommended procedures and control measures of the Sheet Metal and Air Conditioning Contractors National Association (S.M.A.C.N.A.) IAQ Guidelines for Occupied Buildings Under Construction, current edition, Chapter 3.*
2. *All new ductwork shall be protected from weather, dust and physical damage with appropriate planning and site management. Duct sections, diffusers, grilles, dampers, etc. shall be stored in clean, protected areas shielded from rain and protected against moisture.*
3. *All supply and return openings shall be sealed with 6-mil plastic during construction. Any sections of ducts stored on site prior to installation shall be sealed with 6-mil plastic on both ends. The contractor shall provide digital pictures as a proof of following these procedures.*
4. *If permanently installed ductwork is used for air delivery during construction (e.g. for balancing or temporary heat purposes), filtration media with a minimum MERV-8 rating shall be used at each air handling unit and return air inlets. All duct outlets shall be covered with cheesecloth. MERV-13 rated filters shall be used for final installation in all equipment.*

1 GENERAL

.1 This section provide installation and construction specification standards for HVAC ductwork distribution systems.

2 DESIGN REQUIREMENTS

.1 The procedures and control measures for protecting ductwork during construction shall comply with the requirements of LEED IEQ Credit 3.1, Construction IAQ Management Plan: During Construction. This is regardless of having the project LEED certified or not.

.2 All ductwork distribution should be sized to a low velocity standard defined as a maximum of 0.1" SP and 1,200 FPM duct velocity. Variable air volume systems shall not exceed 1,800 FPM velocity in ductwork distribution mains.

.3 Volume air extractors shall not be used in the design of the ductwork distribution system. Balancing dampers shall be provided at each ductwork branch location for system balancing.

.4 Ductwork distribution in any systems provided with mechanical cooling shall be insulated to prevent condensation.

3 PRODUCTS

.1 DUCT PRESSURE CLASSIFICATION

.1 Fabricate ductwork and plenums to SMACNA standards suitable for the intended system pressure. (low, medium or high pressure)

.2 SEAL CLASSIFICATION

.1 Ducts with a pressure rating above 500 Pa. shall utilize class A sealing.
.2 Ducts with a pressure rating of 500 Pa. shall utilize class B sealing.
.3 Branch ducts to diffusers other than takeoff shall utilize class C sealing.

.3 MATERIALS

.1 Ducts: Galvanized steel lock forming quality, having galvanized coating to ASTM A525 G90 designation for both sides.

.2 Fasteners: Use rivets and bolts throughout; sheet metal screws accepted on low pressure ducts.

.3 Sealant: Water resistant, fire resistive, compatible with matching materials. Duct sealer shall be Duro Dyne S-2 c/w FT-2 tape Flexmaster duct band.

.4 Flexible Ducts: Corrugated aluminum or fabric supported by helically wound steel wire or flat steel strips, Fabriflex FAB4 or FAB4T.

.5 Kitchen Exhaust: Minimum 1.5 mm black iron or 1.2 mm stainless steel with welded joints. Exposed duct must be stainless steel.

.6 Fume hood exhaust ducts shall be 316 stainless steel 2 gauges heavier than SMACNA Standard, 18 gauge minimum. Spiral duct permitted on the negative pressure side of the fan system only.

.7 Exhaust hoods and ducts shall be 304 stainless steel.

.8 Stainless steel ducts and hoods shall have Type 2B finish where concealed or No. 4 finish where exposed.

.9 Support hangers and clips for hoods and ducts shall be of the same finish and material as the hood and/or duct.

.10 Exposed ductwork in Gymnasiums shall be 2 gauges heavier than SMACNA and double the number of hanger supports provided.

.4 LOW PRESSURE DUCTWORK

.1 Construct low pressure ductwork and fittings in accordance with minimum SMACNA Standards.

.5 MEDIUM PRESSURE DUCTWORK

.1 Construct high pressure ductwork and fittings in accordance with minimum SMACNA Standards.

.6 KITCHEN EXHAUST DUCTWORK

.1 Fabricate ductwork from 1.5 mm black iron or 1.2 mm 304 stainless steel.

.2 Weld all seams and joints.

.3 All exposed ducts shall be stainless steel with No. 4 finish.

.4 Install gasketted companion flange connections at connections to equipment. Bolt flanges together with cadmium plated hex head bolts at 100 mm centres and at corners.

.5 Install gasketted cleanouts, 450 mm x 300 mm with angle reinforced frames at base of risers, at all offsets and where required by NFPA 96 and governing Codes. Fasten with wing nuts on 100 mm centres.

.6 Install a residue trap with cleanout at base of vertical risers and at each trapped point.

.7 Provide minimum 150 mm clearance on all sides of ductwork in accordance with NFPA 96.

.7 FUME HOOD AND EQUIPMENT EXHAUST DUCTS

.1 Ductwork shall be fabricated from a minimum 1.2mm, 316 stainless steel.

.2 In finished areas all seams and joints shall be ground smooth, buffed and polished to match stainless steel finish (Minimum #4 polish standard).

.3 Elbows shall be mitred and joint welded. Construct elbows of minimum 5 Sections.

.4 Support exposed ductwork with 50 mm x 1.8 mm stainless steel "U" strap at 2.0 m centres. Strap to match finish of duct.

.8 FLEXIBLE DUCTWORK

.1 Flexible ducts shall be limited in length to 1.5 m.

.2 Insulation shall have a vapour barrier and insulation with a "K" value of 0.033 w/m °C at 24 °C.

.9 PLENUM CONSTRUCTION

.1 Wall and Roof Construct as per SMACNA, alternate casing construction, Fig. 6-3 with smooth exterior wall with 100mm, 18 gauge and maximum panel width of 400mm.

.2 Outdoor air plenum shall have smooth interior wall with smooth exterior 18 Ga. vapour barrier/cover.

.3 Construct door and casing around door as per SMACNA, casing access doors, Fig. 6-12. Section C-C with angle iron frame sized to suit plenum wall. Doors constructed of 16 gauge metal windows 250 mm round Georgian wired glass window c/w rubber frame.

.4 Secure plenum sections and equipment to concrete curbs, structural columns, and other structural elements.

.5 Provide intermediate columns to support plenum roofs as required.

.10 SEALANT

.1 Sealant: oil resistant, water borne, polymer type flame resistant duct sealant. Temperature range of -30°C to 93°C.

.11 HANGERS AND SUPPORTS

.1 Strap hangers: of same material as duct but next sheet metal thickness heavier than duct.

.2 Hanger configuration: to ASHRAE and SMACNA.

.3 Hangers: galvanized steel angle with galvanized steel rods to ASHRAE and SMACNA following table:

Duct Size (mm)	Angle Size (mm)	Rod Size (mm)
up to 750	25 x 25 x 3	6
751 to 1050	40 x 40 x 3	6
1051 to 1500	40 x 40 x 3	10
1501 to 2100	50 x 50 x 3	10
2101 to 2400	50 x 50 x 5	10
2401 and over	50 x 50 x 6	10

4 EXECUTION

.1 INSTALLATION

.1 Locate ducts with sufficient space around equipment to allow normal operating maintenance activities.

.2 Set plenum doors 150 mm to 300 mm above floor. Arrange door swings so that fan static holds door in closed position.

.3 Connect terminal units to medium or high pressure ducts with 300 mm maximum length of flexible duct. Do not use flexible duct to change direction.

.4 Connect diffusers or troffer boots to low pressure ducts with 0.9 m maximum length of flexible duct. Hold in place with caulking compound and strap or clamp, and provide a minimum of 2 hanger wires for seismic restraints.

.5 Where ducts penetrate roofs, install sleeves and roof curb. Provide flashing and counter flashing.

.6 Prior to the fabrication of ductwork, this Contractor shall co-ordinate and field measure all ductwork to ensure a complete installation respecting all other services. Provide all necessary fittings, offsets, and alternate construction methods to facilitate the installation.

.7 Keep duct clean during construction. Cover open duct ends with polyethylene for ducts smaller than 0.4 m2 in area. Larger ducts and vertical shall be capped with metal.

.8 Roof mounted ducts shall have standing seams and shall be sealed weather tight.

.2 FLEXIBLE DUCTWORK

.1 Install flexible ductwork where indicated on the drawings and as specified.

.2 Provide intermediate supports for flexible ducts so that sagging does not occur. Very sharp turns and reduction in the area of the duct will not be permitted.

.3 Connect to ductwork, diffusers, and terminal units with stainless steel worm drive clamps, adjustable clamps or duct straps applied over two wraps of duct tape.

.3 INTERNALLY INSULATED DUCTWORK

.1 For low pressure ductwork use metal nosing on leading and following edges. Ensure butt insulation joints fit tightly and apply adhesive/sealant to edges just prior to joining of duct sections.

.2 For high pressure ductwork install as per low pressure and provide perforated metal lining.

.3 Provide perforated metal lining in plenums and 3m downstream of fans.

.4 HANGERS

.1 Strap hangers: install in accordance with SMACNA.
.2 Angle hangers: complete with locking nuts and washers.

.5 SEALING AND TAPING

.1 Apply sealant to outside of joint to manufacturer's recommendations.

.6 LEAKAGE TESTS

.1 In accordance with SMACNA HVAC Duct Leakage Test Manual.
.2 Do leakage tests in sections.

END OF SECTION 23 31 00

1 GENERAL

.1 Accessories and devices for the ductwork distribution systems.

2 DESIGN REQUIREMENTS

.1 Access doors shall be provided for all serviceable components, valves, controls, dampers and devices behind drywall ceilings and for components inside ductwork distribution such as fire dampers and DDC sensors.

.2 Ensure that all balancing and fire dampers are accessible and identified on as-built drawings and also shown on balancing report ductwork air flow schematics.

.3 Provide flexible duct connections to all equipment which has vibration isolation and spring isolation. Show flexible duct connections on mechanical drawings.

.4 All access doors shall be identified with data dots to indicate the equipment, controls or valves behind the access door.

3 PRODUCTS

.1 ACCESS DOORS

.1 Provide access doors where indicated on drawings, where specified or required for equipment maintenance.

.2 Access doors shall be 600 x 600 unless otherwise indicated or required by duct size.

.3 Access doors for kitchen exhaust ductwork shall be constructed of the same material and gauge as the ductwork. Doors shall be liquid and airtight.

.4 Access panels shall be Nailor-Hart medium pressure 25 mm insulated, Model 0850-1 for rectangular duct and Model 0895 for round ducts. Panels shall be minimum 430 x 630 unless dictated by duct size.

.2 FIRE DAMPERS

.1 Provide fire dampers at locations shown, where ducts and outlets pass through fire rated components, and where required by authorities having jurisdiction. Fire dampers shall be complete with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings, and hinges.

.2 All fire dampers shall be UL listed and have blades out of air stream when in the open position.

.3 All fire dampers to be tested and test report inserted in maintenance manual.

.3 BALANCING DAMPERS

.1 Provide balancing dampers at points on low-pressure supply, return and exhaust systems where branches are taken from larger duct as required for proper air balancing.

.2 Fabricate balancing dampers in low and medium velocity ductwork to SMACNA standards and provide locking handles.

.3 Inside and outside end bearings. Nylon on dampers up to 300mm (12”) high, oilite bronze on dampers over 300mm (12”) high or diameter.

.4 TURNING VANES

.1 Use Airfoil type only complete with runner channels. Use acoustic insulation packed types with perforated metal shapes in lined ductwork applications.

.2 Provide for all square or rectangular duct elbows.

.5 FLEXIBLE CONNECTIONS

.1 Ensure that flex does not reduce fan inlet area or impede airflow.

.2 Ensure flex allows movement of equipment without affecting ductwork.

.3 Install canvas flexible connections on inlet and outlet of all exhaust fans, and inlet and outlet of roof mounted air handling units.

.6 BACKDRAFT DAMPERS

.1 Provide backdraft dampers at inlet to any exhaust fans not provided with automatic control dampers.

4 AIR VOLUME EXTRACTORS

.1 Air volume extractors are not permitted.

5 ROOF MOUNTED GRAVITY (AIR INTAKE OR RELIEF) HOODS

.1 Galvanized steel hoods with louvers on all four sides and arched top for positive drainage and ribbed construction for stability and strength.

.2 Hoods to be painted when visible from the ground as per color indicated and/or selected by the Architect.

6 DUCT CLEANING

.1 Maintain all ~~new~~ ductwork ~~installed on this project~~ clean and free from dust and other workplace debris.

~~.2 If in the Consultant's opinion any new ductwork installed has not been maintained in a clean condition the Contractor shall retain the services of a certified duct cleaning company to thoroughly vacuum and clean ALL outdoor, supply and return air ductwork installed.~~

END OF SECTION 23 33 00

1 GENERAL

.1 Fans for ventilation systems such as general exhaust, washroom exhaust and fumehood exhaust.

2 DESIGN REQUIREMENTS

.1 Exhaust fans where possible should be combined and connected with additional ductwork distribution to reduce the number of fans.

.2 The discharge location for all exhaust system should be a minimum of 20 feet from any outside air intake or opening window. Consideration for prevailing winds and inversion microclimate to be taken into consideration.

.3 Roof mounted exhaust fans and other equipment should be kept a minimum of 10 feet away from the roof edge to avoid fall restraint.

.4 Provide acoustic sound attenuation in ductwork for all exhaust fans greater than ¼ hp. Avoid the installation of inline exhaust fans above occupied spaces.

.5 Exhaust fans which transport odours and fumes such as washroom, kitchen, science, janitor exhaust should be upblast type and located away from outside air intakes.

.6 Fumehood exhaust fans should be utility blower type complete with 10 foot (3 meter) discharge stack.

.7 Exhaust fans in ceiling spaces should be easily accessible and not located over occupied space. Exhaust fans should be located, where possible in mechanical rooms and service room locations.

.8 In addition to wall mounted manual switches, timer switches and reverse acting thermostats, all exhaust fans shall be provided with DDC supervisory monitoring in addition to the manual or DDC system control.

3 QUALITY ASSURANCE

.1 Fans shall be certified to bear the AMCA label for air and sound performance seal.

4 PRODUCTS

.1 Fans shall be commercial/institutional quality fan units complete with motor, drive system, fan blade(s) or cage(s), enclosure, start/stop controls, local disconnect, and mounting mechanism.

5 GENERAL

.1 BELT DRIVE ROOF DOWNBLAST CENTRIFUGAL EXHAUST FANS

.1 Aluminum down blast fan shall be for roof mounted applications and shall be equivalent to Greenheck GB Series.

.2 All fans to be complete with insulated roof curb, disconnect switch and bird screen.

.2 BELT DRIVE ROOF UP BLAST CENTRIFUGAL (KITCHEN HOOD) EXHAUST FANS

.3 DIRECT DRIVE PREMIUM CEILING MOUNTED CENTRIFUGAL EXHAUST FAN

.1 Aluminum up blast kitchen exhaust fan to be equivalent to Greenheck CUBE series kitchen exhaust fan.

.2 Fan to be complete with insulated and hinged roof curb, disconnect, grease cup and bird screen.

.4 BELT DRIVE DUCT INLINE CENTRIFUGAL FANS

.1 Exhaust fans to be equivalent to Greenheck inline, belt driven exhaust fan model BSQ series.

.5 CEILING PROPELLER FANS ~~(GYMNASIUM) CF-1 TO CF-8 & (ART ROOM) CF-9~~

.1 Paddle type propeller fans for de-stratification. All metal construction with baked enamel finish, TEFC motor with sealed chrome ball bearing. Fan to be installed with a secondary support cable.

.2 Provide and install manufacturer supplied solid-state speed controller with reversing switch A single speed controller can control the two fans as a group. The switch should NOT have an OFF position.

.6 FUME HOOD EXHAUST FANS

.1 Laboratory fumehood exhaust fans shall be equivalent to Greenheck Vector-H high plume series exhaust fans.

.2 Fan shall be complete with disconnect, bird screen and weather proof motor enclosure, and fumehood discharge stack.

6 EXECUTION

.1 START UP AND COMISSIONING

.1 Confirm tight seal at all duct connections, and within duct distribution network to all exhaust and supply fans.

.2 Bump electrical motors on three phase fan units to verify the correct rotational direction for all exhaust and supply fans. Correct rotation as required.

.3 Check fan wheel and motor for any excessive vibration and ensure all covers and housings are secure.

.4 Adjust Belt Tension of all exhaust fans at substantial completion and at 6 months during the warranty period.

.5 Lubricate bearings of all exhaust fans initially at substantial completion.

.6 Adjust sheaves drive for final system balancing and provide new sheaves is requested by the balancing agent.

END OF SECTION 23 34 00

1 GENERAL

.1 This section contains specification information on the construction and installation requirements of dust collection systems.

2 DESIGN REQUIREMENTS

.1 All new dust collection systems shall be non-recirculating type and the system and dust collector shall be provided with all required safeties and interlocks as per the latest code requirements.

3 CODE REFERENCES

.1 NFPA 68 Explosion Prevention
.2 NFPA 69 Explosion Isolation
.3 NFPA 664 - Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities
.4 NFPA 77 Static Protection
.5 Worksafe BC Occupational Health and Safety Regulation.
.6 British Columbia Fire Code - 2012

4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 23 05 00 Common Work Results For HVAC – Submittal Requirements.

5 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for unit for incorporation into manual specified in Section 23 05 00.

6 MAINTENANCE

.1 Extra Materials: Two sets of bag filters.

7 QUALITY ASSURANCE

.1 Comply with all local, provincial and applicable WorkSafe BC regulations and requirements. Electrical devices shall be CSA approved.

.2 Initial startup and operational verification of the equipment shall be by an approved and qualified representative of the manufacturer.

8 PRODUCTS

.1 General

.1 Both the new and relocated units shall be complete with all components and accessories as required to meet all code regulations.

.1 All safety related components shall be supplied as an integral part of the factory manufactured dust collector. This shall include all required blow back dampers, explosion hatches, anti-conflagration devices.

.2 Factory Testing and Quality Control

.1 Units shall be factory run tested to ensure proper functioning of components.

.3 Unit Construction Description

.1 Dust Collector to be self contained weatherproof intermittent shaker style unit suitable for inside or outside installation; housing to be minimum 1.98mm angle reinforced all welded construction with factory standard finish.

.2 Filters:

.1 Filters to:

.1 Be tube-type minimum 125mm diameter,

.2 Terylene unless otherwise specified, and have adjustable tension straps.

.2 Filter access is to be by hinged doors.

.3 Filter selection must provide a minimum of one 395 cm^2 of filter per 1.0 L/sec of airflow. Minimum filter area is scheduled.

.3 Access Doors:

.1 Full size access door(s) allowing for periodic maintenance and inspections shall be provided for all serviceable components.

.4 Waste Storage and Collection:

.1 Storage will be in 170 litre drums with castors, and supply will include drums, lids, connector sleeves, and clamps. Minimum storage capacity is scheduled.

.5 Both the new and the relocated Dust Collectors shall be provided with a blowback prevention damper in the inlet and explosion relief venting as appropriate for the location. Explosion doors shall be equipped with limit switches to shut off fan in the event of an explosion. Wiring of switch to control panel is by others.

.6 Location/orientation/rotation of the collector inlet, discharge, shaker, filter door, fan, and drum access to be as per the drawings.

.7 An inline discharge silencer (for new unit only) shall be supplied by the dust collector supplier installed by the contractor.

.8 Automatic Shaker:

.1 The equipment will come with a fully automatic electric motor driven shaker mechanism and remote prewired control panel for the fan and shaker.

.2 The shaker mechanism includes the TEFC shaker motor, shaker motor starter and solid state single cycle timer 115V/60/1.

.9 Control Panel:

.1 The prewired control panel, to be located in the carpentry shop, requires a single power feed.

.2 Panel will include provisions for automatic start/stop interlocks with the woodworking tools.

.3 Panel will include two Photohelic gauges to measure filter pressure drop and provided with alarm.

.4 The panel will include terminals for connection of the explosion door limit switches.

.5 Supply and installation of ¼" tubing between control panel gauges, and dust collector and safety filter is by contractor.

.10 Dust Collector Fan:

.1 Collector shall be supplied with a minimum Class II, backward inclined radial tipped belt driven fan integrally mounted on the top, clean side of the filter, complete with 1800 RPM Hi-Eff TEFC motor, scroll inspection door, and belt guard.

.11 High Speed Abort Damper: (Required for both the new and relocated dust collector)

.12 Spark Detection System: : (Required for both the new and relocated dust collector)

9 EXECUTION

.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

.2 ASSEMBLY

.1 Where units are fabricated and shipped in component sections, the components shall be filed assembled using bolted, gasketted companion flanges to make a single airtight unit. Test for leakage and seal as required.

.2 Install fan on seismic restraint vibration isolators, equal to the standards specified in Section 23 05 48 Vibration and Seismic Controls for HAVC Piping and Equipment of this specification.

.3 Demonstrate watertightness of unit prior to delivery to site.

.3 INSTALLATION

.1 Install floor mounted unit welded to steel plate(s) imbedded in slab (or housekeeping pad) to accommodate seismic loading. Ensure housekeeping pad is securely attached to structure.

.2 Construct unit in sections to facilitate shipping and moving into place. Assemble sections on site as per manufacturer’s recommendations.

.3 All factory supplied, field mounted control devices to be installed and wired by the controls contractor to the standards specified under Section 25 05 60 EMCS – Field Installation.

.4 DEMONSTRATION

.1 Demonstration and Training: provide training in accordance with Section 23 05 00 Common Work Results for Mechanical.

END OF SECTION 23 35 00

Sustainability Goals

1. *Proper air distribution with draft-free and noise-free operation contributes to better Indoor Air Quality in the building.*
2. *Selection and locations of supply, exhaust and transfer air distribution devices shall be designed to maximize ventilation effectiveness in accordance with ASHRAE Standards 62.1, Ventilation for Acceptable Indoor Air Quality as minimum ventilation rates.*

1 GENERAL

.1 This section includes grilles, diffusers, registers and louvres that will be installed as part of the mechanical system or as architectural features of the building.

2 DESIGN REQUIREMENTS

.1 Traditional overhead ventilation with low level return air in gymnasiums should also be included to improve ventilation effectiveness.

.2 Grilles and diffusers should be selected for a maximum of NC30 and the consultant should take into consideration room absorption effects which are often overlooked.

.3 Opposed blade dampers directly behind double deflection sidewall grilles should be avoided as they tend to generate noise.

.4 Locations of low level displacement diffusers shall be carefully planned as to not interfere with whiteboards, millwork and furniture layout or floor seating areas.

.5 All supply and return air grilles in gymnasium spaces shall be of heavy duty construction and provided with protective guards.

.6 All grilles and diffusers in wet areas shall be specified to be of all aluminum construction.

.7 No trickle ventilation systems or minimum outside air ventilation systems shall be permitted.

3 INSTALLATION

.1 Paint ductwork visible behind air outlets matt black.

.2 Connect grilles and diffusers in accordance with requirements of SMACNA HVAC Duct Construction Standards Metal and Flexible.

.3 Exactly locate grilles and diffusers to conform to the final architectural reflected ceiling plans and detailed wall elevations and to conform to the final lighting arrangement, ceiling layout, ornamental and other wall treatment.

.4 Where ceiling mounted diffusers or supply grilles are fitted with distribution pattern adjustments, set adjustments for horizontal air distribution unless instructed otherwise.

.5 Where ceiling diffusers are located in gymnasiums or activity areas they shall be securely fastened in place. Inner cones shall be positively secured in place with sheet metal screws or similar positive fastening and, in addition, shall be fitted with safety chains.

.6 All diffusers, registers and grilles shall be adjusted and balanced for draft-free and noise free air distribution.

.7 The Testing, Adjusting and Balancing Agency shall allow for up to 10% of outlets to be rebalanced at the request of the VSB or Consultant. Refer to Section 20 05 40, Testing, Adjusting and Balancing.

END OF SECTION 23 37 13

Sustainability Goals

1. *Providing adequate filtration for air-handling systems is a key component to introducing and maintaining a high level of air-quality in school facilities.*
2. *For LEED projects ensure that all air-handling equipment are specified to be provided with a minimum MERV 8 filters during the building flush as per Indoor Environmental Quality Credit 3.1.*
3. *Regardless of LEED projects ensure that all final filters installed in air handling equipment are specified to be a minimum of MERV 13 as per IEQ credit 5.*

1 GENERAL

.1 This specification section includes air filters for all mechanical ventilation equipment.

2 DESIGN REQUIREMENTS

.1 A minimum of 2" pleated MERV 13 filters shall be specified and in common sizes such as 600mmx600mm or 300mmx600mm. Roll media and washable filters shall not be specified.

.2 All air-handling systems should be ~~specified to be~~ provided with 2 sets of filters and one spare set of filters. The 1 set of filters will be used during balancing and commissioning and new set of filters will be installed at substantial completion, just prior to building occupancy. One spare set of filters shall be left in the mechanical room to be used by VSB during warranty period.

.3 All filter banks shall be designed to have a maximum air velocity of 2.54m/s (500 fpm) regardless of the size of the equipment or coil velocity.

.4 Ensure that adequate maintenance access is provided for all filter locations and that hinged access doors to all equipment filter sections are provided.

3 QUALITY ASSURANCE

.1 Filters shall be product of and supplied by one manufacturer.

.2 Filters components assembled to form filter banks shall be products of same manufacturer.

4 PRODUCTS

.1 GENERAL

.1 Filter shall not be hydrophilic (water absorbing), shall be resistant to 100% relative humidity, and shall not contain asbestos, fiberglass or urea formaldehyde.

.2 Roll type filters, automatic advance or otherwise will not be considered as an acceptable means of filtration.

.3 The use of permanent washable type impingement filters is not acceptable.

.4 All filters banks shall be equipped with a magnehelic differential air pressure gauge ranged not more than 20% above the maximum proposed operations pressure drop across the filters.

.5 All filters sections shall be designed for 2.54 m/sec maximum air flow.

.2 FRAMES

.1 Fabricate filter frames and supporting structures of galvanized steel or extruded aluminum. Frames shall have solid welded corner sections to prevent dust migration. Provide holding frames 1.6 mm "T" section construction.

.3 FINAL FILTERS (MERV 13)

.1 Filters shall consist of progressively structured filter medium made from unbreakable synthetic microfibres. The front frame shall be made from corrosion resistant hard polyurethane foam.

.2 Have heat-sealed leak-proof seams running along the length and around the periphery of the filter medium.

.3 Filter element pockets shall be totally self-supporting when positioned in a holding frame.

.4 Remain in rigid position during entire life.

.5 Have a documented minimum initial resistance of 161.6 Pa WG and a minimum documented final resistance capability of 373.0 Pa WG when tested to ASHRAE 52-76 standards.

.6 The filter shall have a documented minimum average atmospheric duct spot efficiency of 97% at 945 l/s when tested to ASHRAE 52-76 standards.

.7 The enclosing frame perimeter and grid shall be attached to the media for support and rigidity. The frame material shall not absorb water in high humidity atmosphere.

5 EXECUTION

.1 INSTALLATION

.1 Install filter banks in arrangement shown with removal and access indicated. Demonstrate removal of filters prior to substantial completion.

.2 Project filters shall not be used for temporary or trial usage.

.3 Keep filter media wrapped with protective covering until systems are clean and ready to operate.

END OF SECTION 23 41 00

Sustainability Goals

1. *The efficiency of the central plant is a significant contributor to the overall energy efficiency of the building.*
2. *All new construction projects should include high efficiency condensing boilers in range of 92% efficiency or higher.*
3. ~~*In renovation projects high efficiency boilers may not be warranted where existing terminal units require higher temperature heating water.*~~

1 GENERAL

.1 This section of the specification provides detailed specifications and requirements for stainless steel high efficiency condensing boilers.

2 DESIGN REQUIREMENTS

.1 Heating water systems shall be designed to maximize the use of high efficiency condensing boilers by;

.1 Variable speed pumping to increase system temperature difference. Avoid the use 3-way valves to reset zone temperatures.

.2 Selection of terminal equipment that can operate at low heating water supply and return temperatures. The use of radiant panels with high heating water temperature requirements is discouraged.

.3 High delta-T piping design with low flow control valves and balancing valves should be incorporated.

.4 Design of return water temperatures in the range of 80 to 90 F (26.7 to 32.2C) with reset control..

.2 Boilers shall be located in mechanical rooms and provided with housekeeping pad when floor mounted. Adequate service clearances shall be provided in addition to space to remove and re-install boiler at a future date.

.3 The boiler plant shall be designed with adequate backup capacity and equipment redundancy to ensure continuous school operation at all times. As a minimum, the boiler plant shall consist of two boilers, each sized for minimum 75% of the design heating load. ~~*A boiler plant with 3 boilers can each be sized for 35% of the design heating load.*~~

.4 ~~*Elementary schools shall use a modular boiler system approach with wall mounted boilers up to a maximum of 8 modules. High School projects and projects requiring a higher heating demand shall use floor mounted boilers.*~~

.5 All boilers shall be specified to be complete with float type low water cut – off regardless of the boilers internal safeties.

.6 All piping from pressure relief valves, automatic air vents and service drains shall be piped to floor drains. Provide sufficient number of floor drains inside the boiler plant room to avoid running drain lines across the access routes. Relief valves shall be piped separately from each boiler to drain.

.7 Horizontal flue piping discharge out the side of the building is not permitted and the discharge shall be taken to the roof of the building.

.8 Central boiler plants shall also stay under the 150 square meters of heat exchanger surface area.

3 PRODUCTS

.1 The boiler shall be a condensing boiler and approved manufacturers are IBC and Viessmann as follows;

.1 IBC model SL80-399 or SLO40-399 modular boiler with racking system up to 8 modules at 3,192 MBH.
.2 Viessmann Vitocrossal model 200 up to 2,250 MBH
.3 Viessmann Vitocrossal model 300 – CA3 up to 6,000 MBH

~~**.2 Other proposed manufacturers or models MUST be reviewed by the VSB prior to design.**~~

.3 The boiler shall be specified to be complete with the following

.1 A temperature/pressure gauge;
.2 High limit temperature control with manual reset;
.3 ASME certified pressure relief valve set for 30 to 50 psi depending on system pressure.
.4 Outlet water temperature sensor;
.5 Return water temperature sensor;
.6 Flue temperature sensor;
.7 High and low gas pressure switches,
.8 Low water cut off with manual reset (float style)
.9 Condensate acid neutralizer.
.10 Master/cascade boiler controller and BACnet interface for DDC system.

.4 Venting:

.1 Each boiler shall be equipped with individual boiler manufacturer designed and supplied flue gas AL29-4C stainless steel venting or CPVC venting.

.2 The boiler shall operate under Category IV positive vent pressure conditions for room air dependent operation.

.5 Drain:

.1 Each boiler module shall have a gravity drain and complete with an acidic condensate neutralization tank.

.1 The acid neutralizing tank shall be complete with acid proof piping and unions.
.2 Provide unions on both sides of the acid neutralization tank to facilitate tank inspection, and removal for cleaning and recharging.

.6 Boiler Controls:

.1 Multiple boilers shall be provided with a cascade controller to control firing and combustion process, rotation of individual boilers and operation of boiler's pumps or isolation valves.

.2 The cascade controller shall include BACnet RS485 or BACnet Ethernet communication for integration to the building DDC system.

.3 The building DDC system shall be capable of boilers enable/disable outputs and water temperature reset output and shall receive alarm, status and diagnostic inputs from the boiler's cascade controller.

4 EXECUTION

.1 INSTALLATION

.1 Install the boiler as per the manufacturer's instructions.

.2 Install condensate neutralizing tank(s).

.3 All field mounted control devices shall be wired by the controls contractor to the standards specified in Section 25 05 60 EMCS – Field Installation.

.4 Complete pre-startup checks and boiler inspection.

.5 Fire the boiler and adjust burner operation.

.1 Use combustion stack analyzer to record stack emissions and temperatures a 50% and 100% firing rates.

.2 A copy of the stack analyzer tape shall be kept for inclusion in the maintenance manual.

.6 Complete manufacturer's startup report document that records results of tests and inspections. Return completed manufacturer's star-up report to manufacturer and send a copy to engineer and owner.

.7 Provide sufficient clearance and access as per manufacturer's recommendation to allow free, clear and unencumbered maintenance access.

.8 Interface between the boiler's cascade controller and the building DDC system shall be closely coordinated between the boiler's start-up technician and the Controls Contractor. The boilers supplier shall include for additional site visits of the manufacturer's trained technician to coordinate set-up and calibration of controls in the presence of the Controls Contractor.

.2 DEMONSTRATION

.1 Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain condensing boilers.

.2 Include for on-site boiler plant operation demonstration and training session. The training is to be a full review of all components including but not limited to a full boiler internal inspection, construction details, burner operation, maintenance, flame characteristics, and adjustments, gas train maintenance, boiler normal operation, abnormal events, normal shut-down, emergency shut-down and setting up controls.

END OF SECTION 23 52 00

1 GENERAL

.1 Provide a high efficiency air to water heat pump which is capable of providing chilled water and low temperature heating water.

.2 Operating conditions and requirements

.1 Heat Pump unit shall be designed to operate using R-410 Refrigerant or other non-ozone depleting refrigerant.

.2 The only acceptable manufacturer for the air source heat pump is as follows;

.1 Acceptable Manufacturer: Aermec

.3 Manufacturer shall provide full parts and labour warranty coverage for entire heat pump for a period of **two years**. The warranty shall commence at substantial completion and shall include two complete winters and two complete summers of operation.

.4 During the warranty period, provide TWO years of quarterly (routine) service and maintenance checks.

2 DESIGN REQUIREMENTS

.1 The heat pumps shall be backed up by high efficiency condensing boilers and shall not be the only source of hydronic heating for the project. The heat pump shall not be sized for 100% peak heating capacity.

.2 The heat pump sizing shall also be minimized and peak operating conditions in the range of 5 to 7 deg C shall be taken into consideration.

.3 The location of the heat pump shall be reviewed relative to noise levels within the school, school site and in the surrounding neighbourhood. A combination of appropriate location and screening shall be provided.

.4 The heat pump should be provided with manufacturer's highest acoustic attenuation package and variable speed operation to reduce noise levels.

.5 The heat pump shall be designed to use glycol as the heat transfer fluid to the building – with a heat exchanger to transfer heat to the hydronic system. Glycol should not circulate widely through the building.

.6 The design should include a buffer tank on the glycol side of the heat exchanger in order to minimize rapid temperature oscillations to the HP during operation. Buffer tank shall be sized to manufacturer's recommendations.

.7 Unit to include thermal dispersion flow switches on the inlet of heating and cooling streams to the HP (field fit with piping). Paddle style flow switches are not permitted.

3 SHOP DRAWINGS AND PRODUCT DATA

.1 Submit shop drawings in accordance with Sections 23 05 00 - Submittal Procedures.

4 PRODUCT DETAILS

.1 MANUFACTURED UNIT

.1 Provide factory assembled and tested outdoor air-to-water heat pumps with full heat recovery, consisting of chilled and heating fluid circuits, multiple independent refrigerant circuits, scroll compressors, condenser, evaporator, thermal expansion valve, refrigeration accessories, and control panel. Construction, testing and ratings to AHRI 550/590 and AHRI 340/360.

.2 Conform to CSA B52 requirements and ensure that all refrigerant relief valves are readily accessible for re-certification and replacement.

.2 HEAT PUMP

.1 Heat pumps: CSA approved and carry ARI or CSA certification seal.

.3 The air to water heat pump shall be a 2 circuit, 4-pipe multipurpose high efficiency air to water heat pump unit capable of providing supply of hot and cold water.

.2 Air to water heat pumps shall be Aermec model NRP, NRL or approved equal. Substituted equipment may be considered but must be equal in performance and be approved by the VSB.

.3 The unit shall be provided with a full acoustic package to reduce noise transmission, including compressor blankets.

.1 All heat pumps meet the following sound power levels:

Total sound levels		Octave band[Hz]						
Power dBA	Pressure dBA/10m	125	250	500	1000	2000	4000	8000
		Sound power by central band frequency [dB]						
91	61	85.9	82.4	85.6	86.9	84.3	80.1	69.9

The control logic of the microprocessor and design of the unit shall provide:

.1 PRODUCTION OF CHILLED WATER ONLY: water to the system, and heat rejection outside, through finned coils.

.2 PRODUCTION OF HOT WATER ONLY: using the heat of outside air absorbed thru its finned coil, raise the temperature of the water to be sent to the system through a plate heat exchanger. The heated water shall be produced in a different heat exchanger from the one used for the production of cold water.

.3 COMBINED PRODUCTION: if the system requires hot and chilled water at the same time, the unit shall act as a water heating unit. Controlling heating and cooling in two distinct plate heat exchangers, the heating and cooling shall be generated by the same compressor/compressors. The transition from one configuration to another shall take place automatically (managed by an on-board microprocessor) to optimize the spent energy depending on the utility demand. Units which reject heat to the finned coil rather than to the hot water heat exchanger and require a separate compressor and refrigerant circuit to operate to generate heat and cooling are not acceptable.

.4 The scroll-type hermetic compressors shall be optimized to work with R410A refrigerant and shall be characterized for high efficiency and low power absorption. As standard, it shall also be equipped with a sump heater. The heater shall be powered automatically when the compressor is not in operation. The compressors shall have internal circuit breaker protection, cooled by intake gas and shall be mounted on rubber anti-vibration mounts. To reduce sound emission to a maximum, the compressors shall be enclosed inside an acoustically insulated compartment.

.5 A standard mechanical thermostatic valve, with external equalizer, shall be provided at the exit of the evaporator and bulb sensitive to the intake temperature to maintain the correct level of the gas to the compressor.

.6 Plate type, high efficiency, dry expansion water-refrigerant exchangers shall be braze welded AISI 316 stainless steel. The heat exchangers shall be protected with an electric resistance heater and insulated with ¾ in thick closed-cell polyurethane with closed cell.

.7 Air-refrigerant exchangers shall be made up of fin coils with copper pipes and hydrophilic aluminum louvered fins. Source side exchangers shall operate as condensers (rejected heat) or evaporators (absorbing heat) or be excluded from the circuit (depending on the operation mode of the unit).

.8 The unit shall be provided with helical ECM condenser fans (with an IP 54 degree of protection). The rotors are balanced statically and dynamically, driven directly by 6-pole electric motors. Electrically protected by incorporated magnet circuit breakers, and mechanically with accident-prevention protection nets fixed on the upper part of the framework.

.9 The heat pump shall be provided with the following safety and protection devices:

.1 Fixed calibration high pressure gauge (580 Psi) with manual reset shall be located on the pressing line side of the compressor and has the task to stop the compressor operation in the event of abnormal operating pressure;

.2 High pressure transducer on the low pressing line side of the compressor to signal the work pressure to the control board and generate a pre-warning and alarm in case of abnormal pressure;

.3 Low pressure transducer operating as a low pressure gauge on the intake pipe of the compressor to signal the work pressure to the control board and generate a pre-warning and alarm in the event of abnormal operating pressure;

.4 Cooling circuit safety valves;

.5 DCPX condensation pressure controller to allow successful operation with outdoor temperatures below 50 °F, and down to 15 °F in cooling mode and to allow proper operation in heating mode with outdoor temperatures above 85 °F and up to 107.6 °F;

.6 The electric control board shall be protected by an interlock system with the access door. The lever shall be capable of being locked using one or more padlocks. The electric board shall come complete with:

.1 A transformer for the control circuit;
.2 A door-lock isolating switch;
.3 Fuses for compressors and fans;

.4 Spring type control circuit terminals;
.5 Electrical board mounted outside with double door and gaskets;
.6 Electronic controller;
.7 Control consent relay for evaporator and recovery.

.10 The unit shall be supplied complete with input and output water temperature probes. The heat pump shall also have high pressure transducers (one per circuit) shown on the microprocessor board display. Low pressure transducers shall be present (one per circuit) and also shown on the microprocessor board display.

.11 The unit shall be supplied with a Y type water strainer to allow blocking and removing any impurities in the hydraulic circuits and shall contain a filtering mesh with holes that do not exceed one millimeter in diameter.

.12 The unit shall also be provided with a manual air vent and a flow switch which ensures water flow while operating, on both chilled and hot water heat exchangers.

.13 The unit to be provided with factory mounted electrical phase shift, and brown out protection. Standard of acceptance is Siemens 3UG4615-1CR20

.3 CONTROLS

.1 The microprocessor shall be provided with the following functions:

.1 Complete management of the compressors according to compressor time periods (stand-by between peaks, minimum operating time, minimum switch-off time, etc.) and rotation of the compressors according to working hours and minimum stand-by times (giving priority to the unit efficiency and accuracy in determining water temperature);

.2 Display of all main variables affecting the heat pump operation.

.3 Modify the main operation parameters.

.4 Monitoring via BacNet.

.5 A multipurpose contact that can be used for power and setpoint requirements, and power limitation.

.6 Temperature controlled by means of a step thermostat at the chiller water inlet (proportional control) or outlet (proportional + integral control).

.7 Daily/weekly timer with 4 time periods per day.

.8 Operation differential and low load (water flow low) automatic calculation).

.9 Operating mode automatic calculation according to the outdoor temperature.

.10 Intelligent control of the system inertia (PULL DOWN and PULL UP functions).

.11 Management of any anomalies of the chiller by means of automatic reset warnings, alarms, and chronological history of the anomalies to help diagnose the fault.

.12 Unit and black box alarm history feature (alarm history transferable to PC).

.13 Possibility to adjust the flow temperature of the unit based on the outdoor temperature.

.14 Intelligent defrosting; evaporation control by reducing the fan speed.

.15 The board shall also allow display of all operation parameters read by probes, such as water temperature, delivery pressure, etc.

.4 SUPPORT FRAME

.1 The support frame shall be made of hot galvanized sheet steel and painted with polyester powders able to resist atmospheric agents through time. The supporting structure is made so as to ensure maximum accessibility for service and/or maintenance operations.

.5 ELECTRONIC CONTROL BOARD

.1 The unit shall be provided with an electronic control board to contain the power section and the controls and safety devices management unit. It shall be in compliance with Directive LVD 2006/95/EC, EMC 2004/108/EC and the Canadian Electrical Code. All cables shall be numbered to allow quick recognition of all electrical components. The control board shall contain a control keyboard to allow complete control of the unit.

.6 UNIT WARRANTY SERVICE AGGREMENT

.1 On Site Factory Maintenance and Servicing agreement to be provided with unit for full warranty term.

.2 Manufacturer shall provide full parts and labour warranty coverage for entire heat pump for a period of two years. All parts shall be warranted against defects in material and workmanship. Similar parts-only coverage shall be provided for the heat pump compressors for a period of five years. The warranty period shall commence either on the equipment start-up date or six months after shipment, whichever is earlier.

.3 This warranty is conditional on the following items:

.1 Minimum system volume for unit operation is maintained. Minimum water requirement are applicable for chilled water loop, heating water loop and/or heat recovery water loop and must be maintained at all load conditions. Chilled water loop must have a minimum of 6.5 gal/ton. Heating water and heat recovery loop must have a minimum of 9.3 gal/ton. Please contact local representative for clarification if required.

.2 Unit is started up and commissioned by a factory trained technician

.3 Unit load trend log is reviewed by factory representative, controls contractor, mechanical consultant, and mechanical contractor within 60

days of unit commissioning to ensure the unit is not being subject to adverse cycling conditions.

.4 Manufacturer shall provide the services of a Factory Authorized Service Engineer to provide complete start-up supervision. Factory Authorized Service Engineer shall also be responsible for assembly of the chillers cabinetry package and electrical bus bar system. After start-up a Manufacturer's Representative shall provide a minimum of 8-hours of operator training to the owner's designated representative(s).

5 EXECUTION

.1 INSTALLATION

.1 Install where indicated and in accordance with manufacturer's instructions.

.2 Install outdoor units on roof with vibration isolation providing 95% isolation efficiency.

.3 Secure with hold-down bolts.

.4 Connect to electrical service. Refer to Section 26 05 48, Electrical Wiring.

.5 Connect to chilled water and heating water piping.

.1 On inlet, provide:

.1 Flexible pipe connector.
.2 Pressure and temperature port.
.3 Shut-off valve.

.2 On outlet, provide:

.1 Flexible pipe connector.
.2 Pressure and temperature port.
.3 Shut-off and balancing valve.

.2 PIPING SYSTEM REQUIREMNTS

.1 Minimum system volume for unit operation is maintained. Minimum water requirement are applicable for chilled water loop, heating water loop and/or heat recovery water loop and must be maintained at all load conditions. Chilled water loop must have a minimum of 6.5 gal/ton. Heating water and heat recovery loop must have a minimum of 9.3 gal/ton. Please contact local AERMEC representative for clarification if required.

.2 Prior to connecting the Heat Pump to the building Load water loop, the piping shall be flushed with a detergent and hot water (110-130° F) mixture to remove previously accumulated dirt and other organic residue.

.3 During the flushing a 30 mesh (max.) Y-strainers (or acceptable equivalent) shall be in place before the heating and cooling heat exchanger and examined periodically as necessary to remove collected residue. The flushing process shall take no less than 6 hours or until the strainers, when examined after each flushing, are clean. After flushing with the detergent and/or dilute acid concentrations the system loop shall be purged with clean water for at least one hour to ensure that all residual cleaning chemicals have been flushed out.

.4 Prior to supplying water to the Heat Pump the Water Treatment Specification shall be consulted for requirements regarding the water quality during Heat Pump operation. The appropriate Heat Pump manufacturer's service literature shall be available to the operator and/or service contractor and consulted for guidelines concerning preventative maintenance and off-season shutdown procedures.

.3 START-UP & COMMISSIONING

.1 Commissioning agent and factory representative to review installation.

.2 Commissioning agent, controls contractor, factory technician to be present during start-up and certify performance.

.3 Commissioning agent to provide verbal and written instructions to operating personnel.

.4 Unit load trend to be reviewed by factory representative, mechanical contractor, controls contractor, and mechanical contractor within 60 days of unit commissioning.

.5 Submit written report to Consultant and the VSB.

.6 Perform functional test of multifunction heat pump before shipping.

.7 Before heat pump installation, examine roughing-in for equipment support, anchor-bolt sizes and locations, piping, and electrical connections to verify actual locations, sizes, and other conditions affecting heat pump chiller performance, maintenance, and operations.

.1 Heat pump location indicated on Drawings is approximate. Determine exact locations before roughing-in for piping and electrical connections.

.8 Proceed with installation only after unsatisfactory conditions have been corrected.

.9 Inspect field-assembled components, equipment installation, and piping and electrical connections for proper assemblies, installations, and connections.

.10 Complete installation and startup checks according to manufacturer's written instructions and perform the following:

.1 Verify that refrigerant charge is sufficient and heat pump has been leak tested.

.2 Verify that pumps are installed and functional

.3 Verify that thermometers and gages are installed.

.4 Operate multifunction heat pump for run-in period.

.5 Check bearing lubrication and oil levels.

.6 Verify proper motor rotation.

.7 Verify and record performance of chilled- water flow and low-temperature interlocks.

.8 Verify and record performance of heat pump protection devices.

.9 Test and adjust controls and safeties. Replace damaged or malfunctioning controls and equipment with new.

.11 Complete manufacturer's startup report document that records results of tests and inspections. Return completed manufacturer's star-up report to manufacturer and send a copy to engineer and owner.

.4 APPLICATION

.1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

.2 Provide appropriate protection apparatus.

.3 Ensure adequate clearances for servicing and maintenance.

.4 Manufacturer to approve installation, to supervise startup and to instruct operators. Provide labour and resources as required in a timely manner. Refer to Section 23 05 00 Common work Results for HVAC for requirements.

.5 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by rotary-screw water chiller installation.

.6 INSTALLATION

.1 Install multifunction heat pump on support structure.

.2 Equipment Mounting:

.1 Install multifunction heat pump on concrete curbs using vibration spring isolators. Refer to Section 23 05 48 Vibrations and Seismic Controls for HVAC Piping and Equipment.

.1 Mounting the heat pump on elastomeric pads will NOT be accepted.

.2 Comply with requirements in Division 03 Section 03 30 00 Cast-in-Place Concrete.

.3 Maintain manufacturer's recommended clearances for service and maintenance.

.4 Charge multifunction heat pump with refrigerant if not factory charged and fill with oil if not factory installed.

.5 Install separate devices furnished by manufacturer and not factory installed.

.6 All field mounted control devices shall be wired by the controls contractor to the standards specified in Section 25 05 60 EMCS – Field Installation.

.7 Provide technical support, as required, to the Controls contractor, the installation, wiring, and setup of the BACnet interface.

.8 The installation, wiring, and setup of the BACnet interface shall be by the Controls contractor. Refer to Section 25 05 00, and Section 25 05 60.

.7 DEMONSTRATION

.1 Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain multifunction heat pump.

END OF SECTION 23 64 00

Sustainability Goals

1. For LEED certified buildings, all outdoor air connections to the air handling units shall be provided with outdoor air flow measuring stations to comply with the requirements of LEED IEQ Credit 1, Outdoor Air Delivery Monitoring.
2. Regardless of LEED certification, and in all construction projects, variable speed fan control, and low pressure drop coils and filters should be incorporated in all air-handling units to reduce fan horsepower and contribute to the buildings energy performance.

1 GENERAL

.1 This section of the specification provides detailed specifications and requirements for air-handling units.

2 DESIGN REQUIREMENTS

.1 All air-handling units that are 2000 L/s and larger shall be custom built air-handling units. Smaller units shall either be custom built or packaged modular air-handling units.

.2 Air to air heat recovery shall be considered and incorporated into the air-handling units where suitable.

.3 Silencers shall be considered for the discharge and inlet to all major air-handling units where noise levels exceed NC30 in classrooms and other building areas.

.4 Specify 2 sets of filters for air-handling units and in the case of LEED a 3rd set of filters for the building flush.

.5 Ensure that adequate service access is provided in each section of the air-handling unit. Provide access to fan section, coil section, filter section and mixing damper sections.

.6 All freeze protection pumps, control valves, disconnect switches, variable speed drives and other devices are to be installed at an accessible height.

.7 All access doors into each section of the air-handling unit must be hinged access doors with a minimum size of 500 x 1200.

.8 Ensure that adequate space is provided ~~in the mechanical room~~ for removal and installation of new heating and chilled water coils.

3 PRODUCTS

.1 Fans

.1 All fans to be internally isolated and AMCA certified.

.2 Fans shall be mounted on common solid steel shafts with self-aligning pillow block type ball bearings.

.3 Bearings shall be fitted with extended grease lines and grease nipples allowing lubrication from the service side of the fan unit.

.4 Each assembly shall be fitted with a motor, adjustable motor slide base, adjustable pitch vee belt drive, and belt guard. All shafts and sheaves shall have cut keyways and fitted steel keys. Vee belts shall be selected for 150% of motor nameplate horsepower.

.2 Casing

.1 Unit floor casings shall be constructed on a minimum 15.2 cm deep welded structural steel tubing base frame around the entire perimeter of the unit.

.2 Unit floor panels shall be minimum 1.29 mm steel checker plate continuously to the base channels and epoxy coated with durable walk on finish.

.3 Unit walls and roof shall be manufactured to be 5.1 cm "Double Wall" construction for each section of the unit.

.4 Cabinet is with a minimum 1.29 mm powder coated G-90 solid outer panel and a minimum 20-gauge G90 galvanized, inner liner for double walls.

.5 Unit panels to be of standing seam construction with seams turned inward to provide a smooth flush exterior.

.6 Insulation: Panels to be insulated with 5.1 cm – 1.6 kg double density pre-molded rigid board fire-resistant with.

.7 Hinged double panel insulated man size access doors of a minimum 500 mm wide x 1200mm high shall be provided to give access to all sections of the air-handling unit.

.8 All doors shall open against the air flow in such a manner as not to open into the person opening the door from outside as well the door once opened shall not be grabbed by the air flow and to pull the person into the air handling unit.

.9 All fan head sections and all fan discharge plenum sections shall be double panel wall construction.

.1 Insulation shall be covered with a perforated metal liner.

.10 All coil sections shall be double panel construction.

.1 Insulation shall be faced with a 0.81 mm sheet metal liner, factory finish dry-powder baked polyester coating paint.

.11 All interior surfaces shall be painted with a factory finish dry-powder baked polyester coating paint.

.12 All exterior surfaces shall be painted white with a factory finish dry-powder baked polyester coating paint.

.13 Lights and Services Plugs

.1 Each section shall have water proof light emitting diode (LED) light fixtures connected to one on/off switch on unit pre wired.

.3 Coils

.1 Coils shall be with copper tubes, aluminium fins, and stainless steel casings, including heating coils, cooling coils and heat recovery coils. Coils shall be drainable and cleanable. Unless noted otherwise on the schedules, coil fin spacing shall not exceed 4 fins per cm. Coils shall be suitable for minimum 1.03 MPa working pressure. Coil face velocity shall not exceed **2.54 m/s. (500 FPM)**

.2 Air seals shall be fitted where coil piping connections pass through the casing.

.3 Where cooling coils are installed, units shall be fitted with stainless steel drain pans under the complete cooling coils section.

.1 Pans shall have continuously welded seams and corners and shall be minimum 5.1 cm deep. 304 SS drain pans shall cover the full bottom of the cooling coil section.

.4 Unit Installation

.1 Make ductwork, piping, and wiring connections to the unit in accordance with the drawings with sufficient space for equipment maintenance, coil removal and repair.

.2 Install unit so that the required trap occurs above the floor. Provide trap primer.

.3 ~~Install floor mounted unit welded to steel plate(s) imbedded in slab (or housekeeping pad) to accommodate seismic loading. Ensure housekeeping pad is securely attached to structure.~~

.4 Where air units are fabricated and shipped in component sections, the components shall be field assembled using bolted, gasketted companion flanges to make a single airtight unit. Test for leakage and seal as required.

.5 Maintain proper clearance around equipment to permit performance of service maintenance, coil removal and repair.

.6 Make ductwork, piping, and wiring connections to the unit in accordance with the drawings.

.7 Pipe from condensate drains to drain complete with trap. Install unit so that the curb / housekeeping pad height is sufficient to accommodate depth of 'P' trap.

.8 Complete manufacturer's startup report document that records results of tests and inspections. Return completed manufacturer's star-up report to manufacturer and send a copy to engineer and owner.

.2 DEMONSTRATION

.1 Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain the air handling units. Refer to 23 05 00 Common Work Results for HVAC.

END OF SECTION 23 73 00

Sustainability Goals

1. Regardless of LEED each classroom unit ventilator shall be equipped with a CO2 sensor to comply with the requirements of LEED IEQ Credit 1, Outdoor Air Delivery Monitoring.
2. Variable speed fan control, ECM motors and low pressure drop coils and filters should be incorporated into the unit ventilator to reduce fan horsepower and contribute to the buildings energy performance.

1 GENERAL

.1 This specification section contains construction details and standards for vertical unit ventilators which are suitable for classrooms.

2 DESIGN REQUIREMENTS

.1 Unit ventilator locations in each classroom shall be carefully coordinated with the classroom layout for minimum interference with teaching space. All unit ventilators shall be located on the exterior wall to minimize outside air ductwork.

.2 Ensure that adequate clearances are provided for the unit ventilator so that the front access door is clear.

.3 All unit ventilators to be complete with a back plenum to allow the outside air intake louver to be installed at high level on the exterior wall. If outside air intake louver is adjacent to a parking lot, the outside air intake shall be taken to the roof.

.4 Low noise levels for unit ventilators are extremely important. Ensure that adequate supply air ductwork is installed on the supply air discharge side of the unit ventilator for adequate supply fan attenuation. The classroom noise levels shall not exceed NC 30 in all modes of operation.

.5 In addition to room temperature control all unit ventilators shall be provided with CO2 control through the DDC system.

.6 The unit ventilator coils and fans must be designed consistent with the HWS Temp of <48.4 deg C at design condition (see section 23 05 13).

3 FACTORY TESTING

.1 Unit ventilator shall be fully inspected and run tested prior to shipping to site.
.2 Consultant may request a factory visit to view the units prior to shipping.

4 PRODUCTS

.1 VERTICAL UNIT VENTILATORS

.1 Provide packaged, vertical unit ventilators with upflow or downflow configuration.

.2 Approved manufacturers are Engineered Air and Apollo Unit ventilators.

.3 Unit Construction as follows:

.1 Supply air fan with ECM motor.
.2 Filter section for 50mm pleated filters.
.3 Mixing section with factory installed dampers, damper actuator and stainless steel or aluminum linkage rods.
.4 Hydronic heating coil.
.5 Hydronic 'A'-frame cooling coils where required.
.6 Top discharge plenum with acoustic liner.
.7 Back / side mounted outdoor air plenum with internal duct liner.

.8 Copper hydronic heating water supply and return piping and factory installed two-port control valve(s).

.9 Factory installed power and control wiring

.4 General Assembly

.1 Unit casings shall be constructed satin coat steel, welded and reinforced for rigidity. Casing exterior finish to be beige powder coated. Unit casings to be limited to the maximum widths and constructed of the required gauge steel as indicated below:

.2 The interior of the entire casing shall be lined with fiberglass plenum liner, Manville Permacote Linacoustic R-300 or approved equal, minimum 50mm (2-inch) thick, neoprene coated on the air side.

.3 Interior bracing and bulkheads to be constructed of 18-gauge, galvanized steel welded and reinforced for rigidity to prevent vibration.

.4 Access doors shall be constructed as casing c/w 50-mm (2-inch) acoustic insulation. The finish shall be the same as the casing exterior. Access doors shall have full 'piano' style hinging along the entire length of the door. Doors to be removable for complete serviceability and be provided with vandal-proof cam-locks, operable by Allen key lock.

.5 Return air grille is constructed into the unit and is manufactured with an oval punch pattern. Grilles should be sized to operate in a quiet fashion at 100% return air.

.6 Outdoor air will be controlled by carbon dioxide sensors, so 100% return air operation is possible even during occupied hours.

.5 Supply Fan and Motor

.1 Fan to be Backward inclined centrifugal fan wheel, with scroll and housing constructed to meet AMCA standards.

.2 The motor shall be an electronically commutated motor (ECM) capable of having its speed proportional controlled by an external 0 to 10 Vdc control signal.

.3 The motors shall be set up at the factory to accept a 0 to 10 volt control signal and provide a feedback signal.

.4 Fan and motor shall be constructed with quick release latches and power disconnect for ease of serviceability.

.6 Heating /Cooling Coils

.1 Single hydronic heating/cooling 'A'-frame coils or separate heating and cooling coils where indicated in the equipment schedules.

.2 ARI certified construction, of aluminum fins mechanically bonded to ½-inch copper tubes, attached to a 16-gauge galvanized frame, and installed for ease of field connection and future removal.

.3 Factory pressure tested to 3103 kPa (450 PSIG). Factory installed manual air vent at high point and drain valve at low point.

.4 Provide stainless steel drain pan under coil where cooling coil is provided. Provide condensate drain connection to the exterior of the unit piped in copper piping and insulated.

.5 Insulated copper heating water and chilled water pipe shall be factory installed within the unit to the top or the bottom as specified in the Mechanical Equipment Schedules.

.6 Copper hydronic heating / cooling water supply and return piping and factory installed (two-port) heating / cooling control valve(s). The control valves will be supplied and installed by the unit ventilator manufacturer

.7 Ball valves to provide isolation of the control valves and coils, drain valves and automatic air vents.

.8 Factory install manual air vent at high point of coil installation, and a drain valve c/w shutoff, cap & chain at the low point of coil installation.

.9 Circuit balance valve in the return water pipe.

.7 Air Filters

.1 Filters: 50 mm MERV 13 filters in a horizontal holding frame that allows slide-out removal of filter panels from front access door.

.8 Mixing Sections

.1 Parallel blade outdoor and return air dampers, interconnected for simultaneous operation. Dampers of aluminum construction with gasketted blade edges to provide positive shut-off when closed. Standard of acceptance: Tamco or Ruskin CD-50 or equivalent.

.2 Stainless steel or aluminum linkage rods, of sufficient thickness to move the dampers between the full open and full closed positions with no distortion to the damper frames or blades, or the actuator rods.

.3 The mixing section must be removable without dismantling the unit and/or damper assembly. The damper assembly must come out as one module.

.4 Damper actuator shall be factory installed.

.9 Line Voltage Wiring

.1 Line voltage wiring shall be factory installed in conduit within the unit(s) to a single point connection.

.2 An un-fused local disconnect, door switch, fan relay and 40VA transformer shall be factory installed. The door switch disconnect is to be linked to operation of the fan only. A separate internal disconnect switch for DDC control power is to be provided.

.3 All components shall be contained inside a hinged control panel as to access mixed air damper section.

.10 Control Wiring

.1 Control wiring from the fan relay, low limit thermostat, control valve actuator and damper actuator shall be factory installed in 1" conduit within the unit to the terminal strip located in the control panel section.

.2 Factory install and wire a manually reset, low limit thermostat to protect the heating coil.

.1 Wire the thermostat to shutdown the supply fan and close the outdoor air damper upon sensing a supply air temperature below 4°C (40°F) downstream of the heating coil.

.11 Outside Air Back/Side Plenums

.1 Outside air plenums shall be constructed of 18-gauge satin coat steel with powder coated exterior finish to match the unit casings.

.2 Plenum shall be lined on three sides with 13-mm (1/2-inch) acoustic fiberglass plenum liner, Manville Permacote Linacoustic R-300 or approved equal, neoprene coated on the air side.

.3 Plenum to be 250-mm (10-inches) deep away from the wall to allow 225-mm (9-inch) deep dimension for airflow. Height of back plenums to match the overall height of the unit ventilator plus any top and/or bottom plenums specified.

.12 Allowable Noise Level

.1 The noise generated by each unit ventilator is required to meet or better the following sound criteria in all eight octave bands within the classroom, when measured at a distance of 1.5 metres (5 feet) directly in front of the return air grille.

Octave Band (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
(Max dB)	62	58	43	41	38	33	30	23

.2 DEMONSTRATION

.1 Engage a factory-authorized service representative to demonstrate the unit ventilator to the VSB maintenance personnel.

END OF SECTION 23 82 00

Sustainability Goals

1. *The DDC system shall allow facility management strategies to optimize overall energy consumption. Energy saving sequences of operation shall be incorporated into the design.*
2. *Providing sub-metering where appropriate and allow corrective actions to maximize energy savings. Refer to Section 25 90 01 for Submetering requirements.*

1 GENERAL

.1 The scope of work for the controls contractor in addition to installing a fully function DDC (direct digital control) system also includes the field installation and wiring, (both low and line voltage wiring), of sensors, devices, and control panels that are supplied with other mechanical equipment specified in other sections of the mechanical division.

.2 This work shall include, but is not limited to, the following:

.1 Temperature, pressure, CO2 and occupancy sensors
.2 Relay panels and wiring
.3 Dampers, valves and actuators
.4 Low voltage power, and communication wiring
.5 BACnet communication interfaces
.6 MODBUS communication interfaces
.7 Main control panels and application controllers
.8 Lighting control panel interfaces
.9 Security system interfaces
.10 Fire alarm system interfaces

.3 The approved control contractor for VSB is **ESC Automation** for all new, existing and renovation projects.

2 DESIGN REQUIREMENTS

.1 All mechanical equipment shall be provided with a DDC system ~~in new buildings and connect to existing systems in existing buildings. Where existing pneumatic control systems exist, VSB maintenance shall be consulted with respect to the extent of a DDC upgrade.~~

.2 ~~Prior to tender and at 95% review stage the mechanical consultant shall~~ submit a complete DDC system points list and a draft sequence of operation for each piece of mechanical equipment for review by the VSB. Refer to “Sequence of Operation” specification section. All temperature sensors, CO2 and occupancy sensor locations to be shown on the mechanical drawings. All DDC temperature and pressure sensors installed in piping to be shown on the mechanical as-built drawings and as-built piping schematics for coordination.

.3 In addition to basic operational controls ensure that DDC system feedback and safety devices, such as current sensing, water and air temperature sensors, freeze stats and flow switches are specified.

~~.4 Integration of lighting controls through the building DDC system might not be applicable to all projects. The Consultant shall confirm implementation of this option with VSB maintenance and Construction Coordinator.~~

.5 The DDC system shall also be provided with a full graphical user interface and the graphics display shall follow the “VSB Screen Display Guidelines”.

.6 Classroom ventilation shall be controlled with CO2 sensor in addition to temperature sensor. Occupancy sensors for classrooms spaces are optional.

3 PRODUCTS – BASE BID AND APPROVED EQUAL MANUFACTURERS

Air Flow Measuring Stations	Ebtron
Air Flow Switch (Sail Switch)	Dwyer
BTU Meter	Onicon
Control Dampers - Low Leakage	American Warming, Tamco, Ruskin
Controls - DDC	ESC Automation, Delta
Control Valves (Ball Valve)	Belimo Ball Valve
CO2 Sensor	CET
Dampers – Fire and Smoke	Canadian Advanced Air, Maxam, Ruskin, Controlled Air, Nailor Industries, Pottoroff
Direct Mount Damper Actuators	Belimo, Seimens, Schneider, Johnson Controls, Honeywell
Flow Switch	McDonnell Miller (ITT)
Occupancy Sensor	Watt Stopper
Pressure Sensor (Fluid)	Greystone
Pressure Sensor (Gas)	Modus
Temperature Sensors	ACI, Greystone, Delta

4 SUBMITTAL REQUIREMENTS

.1 Shop Drawings shall as a minimum include the following items:

.1 **MANUFACTURER'S DATA SHEETS**:

.1 For each controller, sensor, final control element (valves, dampers, etc.), communications device and software package submit the manufacturer's product information sheet.

.2 **DETAILED SYSTEM ARCHITECTURE:**

.1 Provide drawings that show the specific engineering details of the panel configuration, point layout, attached devices.

.1 DIRECT DIGITAL CONTROL PANELS

.1 Provide one drawing for each DDC panel, (excluding application specific controllers), in the system.

.2 DIRECT DIGITAL APPLICATION SPECIFIC CONTROLLERS

.1 For application specific controllers, (variable air volume box controllers, heat pump controllers, etc.), multiple units that have the identical configuration, provide one drawing for each configuration.

.3 **MECHANICAL SYSTEM SCHEMATICS**

.1 Provide drawings that show the specific mechanical system layout, DDC points and devices, low and line voltage equipment, and wiring for each piece of mechanical equipment being controlled.

.2 Where multiple pieces of identical, core heating ventilating, and air conditioning equipment are installed, (e.g.: unit ventilators, packaged roof top units, fan coils, etc.), provide a separate drawing for each piece of equipment.

.3 Provide a floor plan showing the physical location and system architecture of each DDC panel.

.4 **VALVE SCHEDULES**

.1 Provide a valve schedule in a spreadsheet table format identifying detailed valve information such as flow rate, Cv rating, pressure drop and physical location.

.5 **DAMPER SCHEDULES**

.1 Provide a damper schedule in a spreadsheet table format including damper location, size, type and air velocity.

.6 **FLOW MEASURING STATIONS SCHEDULES**

.1 Provide a flow measuring station schedule in a spreadsheet table format including model, manufacturers, size, flow rate and range and physical location.

.7 **DETAILED SEQUENCE OF OPERATION**

.1 Provide a written sequence of operation for each piece of equipment or system being controlled that does not require knowledge of DDC programming.

5 QUALITY ASSURANCE

.1 TRAINING

.1 During, and at completion of the project, the Controls Contractor shall provide instructions and training to the VSB operating and maintenance personnel on the complete operations and maintenance of all systems and review of all programs. Duration and number of instruction/training sessions shall be established based on the complexity and size of the project.

.2 Provide 4 complete inspection and training visits as follows;
- small renovation project = 1 hour each
- new elementary and high school = 8 hours each

.3 Equipment shall be tested and commissioned during each mode of operation, and under all possible conditions (ie - heating, cooling, free-cooling, night set back, etc.).

.2 WARRANTY

.1 The Controls Contractor shall include for a complete service of the DDC system, including call-backs, fine-tuning, corrections to programming and adjustments of devices, for a period of **two years** following the Substantial Completion.

.2 Emergency repairs shall be performed within eight hours of the problem being reported.

.3 IDENTIFICATION AND LABELLING

.1 All control devices, operators, instruments and sensors with symbols relating to the control diagrams

.2 Each DDC point in a control panel with an identification tag relating to the control Diagrams (Use Brady type stickers)

.3 All control wires entering and leaving a control panel with a permanently attached identification number relating to the control diagrams. (use luggage tag type labels)

.4 All manual switches, excluding items with lamacoid standard nameplates

.5 All motor control centres and motor starters with labels identifying that they are under automatic control to lamacoid labels.

.6 All mechanical equipment under control of the DDC system to be provided with lamacoid label or luggage tag type label.

.7 Provide an input/output sheet within each control panel cabinet indicating the name and type of the points connected to the respective panel. Each panel shall be labelled indicating the address number as shown on the control diagrams and as programmed in the system. Sheet shall be laminated and installed inside panel.

6 EQUIPMENT START-UP

.1 The initial equipment start-up shall be completed prior to involving the Testing, Adjusting or Balancing Agency and the Commissioning Agency.

.2 The initial start-up of each piece of equipment shall be documented with a start-up checklist.

.3 **Commissioning and Calibration Report:** Submit a final Controls Commissioning and Calibration Report. This report shall be used for checking and comparing during the instructions and training to the VSB.

7 INTEGRATION OF LIGHTING CONTROLS THROUGH DDC

.1 Supply all low voltage indoor and outdoor lighting relay/control panels for installation by the Electrical Contractor.

.2 Install a lighting controller when required to interface to the lighting control system.

.3 Provide all programming and graphics with floor plans for low voltage lighting controls.

.4 Supply and install all occupancy sensors required primarily for lighting controls and secondarily for HVAC system controls. All occupancy sensors shall be integrated into the DDC system.

.5 All work stated above shall be done by the control supplier under the sub-contract with the Electrical Contractor. All requirements for low voltage lighting relay panels and occupancy sensors shall be based on the design by the Electrical Consultant.

END OF SECTION 25 05 00

1 SCOPE OF WORK

.1 Installation of communication backbone, control panels, auxiliary control panels, and field device for the DDC SYSTEM.

.2 Supply, installation, and termination of wiring required by the DDC SYSTEM. This shall include low voltage wiring, line voltage wiring, and communications wiring.

.1 Installation and wiring of third party devices, communication and /or interface modules. This shall include but is not limited to BACnet and/or MODBUS communication modules for:

.1 Boilers, heat pumps, circulation pumps, lighting controls, variable speed drives.

.2 Any other equipment that is provided with a communications interface module.

.3 Any other controls equipment that needs to be wired (E.g.: Electronic faucets)

2 WIRING METHODS

.1 All wiring and conduit shall be installed neat workman like manner in tight, parallel runs following the building lines.

.2 All wiring shall be installed as continuous lengths, with no splices permitted between termination points.

.3 Conduit shall be run in all exposed areas.

.4 Use of flexible or BX (or equivalent) shall be limited to a maximum length of one (1) meter, and shall be supported on each end,

.5 Cabling

.1 All cabling shall be installed in a neat and workmanlike manner. Follow manufacturer's installation recommendations for all communication cabling.

.2 Free air cabling installed in non-combustible rated buildings shall be fire rated cable with a minimum rating of FT-6.

.3 Wiring located in combustible rated buildings above T-bar ceiling shall be run in free air using fire rated cable with a minimum rating of FT-6 or FT-4 in conduit.

.4 Install plenum wiring in sleeves where it passes through walls and floors.

.5 Maintain fire rating at all penetrations.

.6 Communication runs must be one continuous run from end to end without splices or connections,

.7 Cabling shall be colour coded with different colours for each conductor,

.8 BACnet MS/TP communications wiring shall be installed in accordance with ASHRAE/ANSI Standard 135.

.9 BACnet Ethernet communications wiring shall be run in Category 6 Ethernet cable.

.10 All Ethernet cables shall be properly terminated to the IT industry standards. Cabling shall not be run directly from a Panel, controller, or any other device directly into a switch.

.11 All Ethernet cables shall be labelled at both ends with information that describes the cables function.

.12 Analog Input Wiring:

.1 The minimum gauge for analogue input wiring shall be AWG 18 cable.

.2 Cabling shall be colour coded with different colours for each conductor.

.3 Analog input runs shall be one continuous run from end to end without splices or connections.

.13 Analog Output Wiring:

.1 The minimum gauge for analogue output wiring shall be AWG 18 cable.

.2 Cabling shall be colour coded with different colours for each conductor.

.3 Analog output runs shall be one continuous run from end to end without splices or connections.

.14 Digital Input Wiring:

.1 The minimum gauge for digital input wiring shall be AWG 18 cable.

.2 Digital input runs shall be one continuous run from end to end without splices or connections.

.15 Digital Output Wiring:

.1 The minimum gauge for digital outputs using a switch DC voltage level wiring shall be AWG 18 cable.

.2 Digital output runs shall be one continuous run from end to end without splices or connections.

.3 The minimum gauge wire for digital outputs using dry contacts shall be AWG 14 or larger wire.

3 DDC SYSTEM PANELS

.1 DDC SYSTEM panels shall be mounted into dust proof, splash tight panel enclosures.

.2 The panel enclosure shall be **mounted no higher than two (2) meters** above finished floor.

.3 Install insulated bushings on all raceway ends and openings to enclosures. Seal top end of vertical raceways.

.4 Wiring within the panel enclosure shall be run inside pre-manufactured, slotted wiring duct (e.g.: PANDUIT PANELMAX™, THOMAS & BETTS TY-DUCT™ WIRING DUCT, OR EQUIVALENT) complete with cover.

.5 All wiring terminations not ending on a DDC SYSTEM panel shall be terminated on a labeled terminal block. The use of marrettes, butt splices, or compression connectors shall not be used inside panels.

.6 Panel enclosures shall be labeled with a LAMACOID™ equipment tag indicating the Tag number and contents (e.g.: PNL-001, DDC SYSTEM PANELS). The lamacoid shall be black with white lettering. The lettering shall be 25mm high.

4 AUXILIARY CONTROL PANELS

.1 Relays, open coil transformers, DC power supplies, etc. shall be mounted into dust proof, splash tight panel enclosures.

.2 The panel enclosure shall be mounted no higher than two (2) meters above finished floor.

.3 Panels shall NOT be mounted in the spaces above T-bar ceilings.

.4 Wiring within the panel enclosure shall be run inside pre-manufactured, slotted wiring duct (e.g.: PANDUIT PANELMAX™, THOMAS & BETTS TY-DUCT™ WIRING DUCT, OR EQUIVALENT) complete with cover.

.5 All wiring terminations shall be terminated on a labeled terminal block. The use of marrettes, butt splices, or compression connectors shall not be used inside panels.

.6 Panel enclosures shall be labeled with a LAMACOID™ equipment tag indicating the Tag number and contents (e.g.: PNL-003, CONTROLS RELAYS). The lamacoid shall be black with white lettering. The lettering shall be 25mm high.

5 POWER TRANSFORMERS

.1 Open coil transformers shall be installed inside panel enclosures

.2 Power transformers feeding final control elements shall be fed from local electrical panel sources.

.3 All transformers shall be protected on the load side by a circuit breaker rated for the maximum capacity of the transformer.

.4 Each transformer shall be labeled with a LAMACOID™ equipment tag indicating the Tag number, power source, and power source disconnect (e.g.: TX-12, E-Pnl “H”, Cct 14). The lamacoid shall be black with white lettering. The lettering shall be 25mm high.

.5 Each transformer load shall be no greater than four (4) amperes. Power transformers greater than 100 VA (150 VA, 175 VA, 200 VA, etc.) that feed multiple loads shall have:

.1 Each load shall carry a maximum of four (4) amperes,

.2 A circuit breaker rated at four (4) amperes shall protect each load,

.3 Each load shall be clearly identified at the transformer’s location.

.6 The Controls contractor shall clearly indicate the type and location of the transformers panel enclosures on an architectural floor plan and include an AutoCAD copy of the floor plan in the Maintenance manuals.

6 APPLICATION SPECIFIC CONTROLLERS

.1 Installation, wiring, powering, and terminating of the Application Specific Controllers (ASC) devices shall be completed according to the manufacturer’s instructions and best engineering practices.

.2 Controllers shall be mounted to ensure free, clear, and unencumbered maintenance access. It is the Controls contractor’s responsibility to coordinate work with other trades to ensure that maintenance access requirements are maintained (e.g.: Coordinate with the sheet metal trades during the installation of variable air volume boxes to ensure that the boxes are mounted with the damper shaft accessible and not located tight to a wall which would impede access to shaft mounted controls).

.3 The Controls contractor shall clearly indicate the type and location of the ASCs on an architectural floor plan and include an AutoCAD copy of the floor plan in the Maintenance manuals.

7 FIELD DEVICES

.1 SPACE TEMPERATURE SENSORS

.1 Space temperature sensors shall be mounted on a wall box recessed into the wall. The wall box shall be filled with Fibreglass insulation batting and a cork gasket shall be mounted between the back of the sensor and the wall mounting box to prevent the sensor reading from being influenced by the wall temperature.

.2 The space temperature sensors shall not be located near entry doors off the corridor for classroom spaces.

.2 CARBON DIOXIDE SENSORS

.1 Space mounted sensors:

.1 Shall be mounted two (2) meters above finished floor,

.2 Return plenum mounted sensors:

.1 Shall be mounted behind the return air grille, eight (8) centimeters back from the face of the grille,

.2 Shall be covered with a cotton dust filter (e.g.: an ankle length cotton athletic sock).

.3 Shall be covered with a cotton dust filter (e.g.: an ankle length cotton athletic sock).

.3 DUCT TEMPERATURE SENSORS

.1 Sensor wiring shall be terminated at the screw terminals of the temperature sensor.

.2 Sensing element types:

.1 Probe sensors shall be used:

.1 In air streams where the stream is well mixed,

.2 Where laminar airflow exists and there is a homogenous temperature across the complete cross sectional area of the duct.

.2 Averaging sensors shall be used:

.1 In mixed air plenums,

.2 In large ducts where laminar airflow exists but a temperature gradient forms over the cross sectional area of the duct.

.3 Duct sensors shall be firmly attached to the ductwork and shall not vibrate loose.

.4 Sensor elements shall be rigidly supported in the air stream. The support shall prevent the sensing element from moving with the air stream.

.4 OUTDOOR AIR TEMPERATURE SENSORS

.1 Locate outdoor air temperature sensors under the eave on the northern most side of the building and away from heat sources (e.g.: direct sunlight, exhaust air vents, HID lighting, or other building operations, etc.).

.2 All sites should have a minimum of **TWO** outdoor air temperature sensors. Both should be located on northern walls – one that is shielded at all times from western sunlight, and one that is shielded at all times from eastern sunlight. (Note: From May-July north facing wall can be exposed to direct sunlight due to solar tracking).

.5 PRESSURE SENSORS

.1 Pressure sensors shall be located far enough down the ductwork to avoid being influenced by fan pulsations.

.2 The water pressure transducer(s)/transmitter(s) shall be housed in a small panel enclosure.

.3 Locate pressure sensor taps far enough away from circulating pumps so that the sensor is not adversely affected by pulsations produced by the spinning pump impeller.

.6 VAPOUR TENSION THERMOSTAT

.1 Low limit vapor tension thermostats shall be installed downstream of all hydronic heating coils directly exposed to an outdoor air stream.

.2 Low limit vapor tension thermostats shall be auto reset type and shall also alarm on DDC system when tripped.

.3 If vapor tension thermostat has tripped more than 3 times in 30 minutes then shut down fan system and revert to fail safe mode with outside air dampers closed, fan system off and heating water control valve at 100% position.

.4 Use devices that have 2 sets of contacts (one for a hard wired shut down, the other for a BMS status of the device).

.5 Locate the thermostat case where the ambient temperature is always warmer than the set point.

.7 CONTROL DAMPERS (INSULATED & THERMALLY BROKEN FRAME)

.1 Automatic control dampers shall be composed of 2.03-mm extruded aluminum multiple blades mounted in a 100-mm extruded aluminum frame. Individual blades shall not exceed 150-mm in width or 1200 mm in length

.2 Entire frame is to be thermally broken by means of polyurethane resin pockets complete with thermal cuts...

.3 Provide insulated dampers where provided for outdoor air, exhaust air or relief air applications and installed in building envelope elements (walls or roofs).

.8 DAMPER ACTUATORS

.1 All damper actuators shall be spring return.

.2 Install the actuator:

.1 Do NOT stack more than two actuators on a damper shaft.

.2 Damper actuator selection should be sized for 125% of the torque calculated to rotate the damper under full load conditions.

.3 If the actuator is to be mounted outdoors, a weatherproof, protective enclosure must be used to shield the actuator.

.9 CONTROL VALVE

.1 Provide fully modulating valves with pressure ratings suitable for system operating pressures. Two-way hydronic valves for shall have equal percentage characteristics. All heating control valves to be Belimo characterized ball valve.

.2 Two-port valves shall be screwed type, NPT connections with ANSI 125 bronze body, field adjustable Cv, field replaceable packings, stainless steel stem, brass plug with EPT disk, and brass seat, constructed to ANSI Leakage Class IV. Size with a maximum of 3 PSI pressure drop when fully open.

.10 CONTROL VALVE ACTUATORS

.1 All control valve actuators shall be complete with actuator, valve linkage kit, and manual valve positioning handle. Only BELIMO, 2-10 VDC, proportionally controlled actuators are allowed for all applications except two position control.

.2 Control valve actuators shall accept a control signal range of 1Vdc to 10 Vdc.

.11 RELAYS

.1 Relays shall be mounted in the DDC SYSTEM panel enclosures.

.2 Relays shall be located on relay bases attached to a DIN rail mounted inside the panel enclosure. Relay bases shall NOT be attached using screws or two-sided tape.

.3 Relays shall be clearly identified with an equipment tag. Do not place the equipment tag on the relay head. Install the equipment tag above or below the DIN rail.

.12 DC POWER SUPPLIES

.1 Low voltage, direct current power supplies shall be mounted in the DDC SYSTEM panel enclosures.

.2 The DC power supply shall be screwed to the back of the panel enclosure. The power supply shall NOT be affixed to the panel back with two-sided tape.

.3 Each separate feed coming off the DC power supply shall be protected with a resettable circuit breaker dedicated to that feed.

END OF SECTION 25 05 60

1 SCOPE OF WORK

.1 The energy management control system (DDC SYSTEM) commissioning shall include the configuration, setup, and verification of all of the controllers, control panels, communication network(s), sensing devices, final control devices, input wiring, output wiring, third party interfaces, and third party devices installed to form the DDC SYSTEM and integrated automation system.

2 EXECUTION

.1 Prior to the start of the commissioning process, the commissioning agent shall convene a start-up meeting with the mechanical contractor, control contractor, mechanical consultant and VSB representative to review the design intent and sequences of operation.

.2 The mechanical consultant is to ensure that the DDC system commissioning has fully taken place and that all devices and sequences of operation are as per specification.

~~*.3 Depending on the size of the project, the DDC system should be demonstrated separately to the consultant in a ½ day session prior to a demonstration to VSB to ensure this specification has been fully implemented.*~~

.4 All commissioning shall be witnessed and signed off by the project's Commissioning Agency.

.5 DDC SYSTEM commissioning shall include the commissioning of the field control panels, field control devices and the graphical user interface.

.6 GENERAL SEQUENCE OF EVENTS

.1 PANEL INITIALIZATION:

.1 Verify that control wiring is properly connected and free of shorts and ground faults. Verify that terminations are tight.

.2 Confirm correct power, network, input, and output wiring connections.

.3 Power up panels.

.4 Configure panel networking parameters and load programs.

.2 END-TO-END POINT CHECKS:

.1 Point verification check sheets shall be completed for every point in the system and shall be submitted to the commissioning agent and included

.3 FIELD DEVICE CALIBRATION

.1 Field devices shall be calibrated. Follow the manufacturers' instructions for calibrating the field device. The following devices, but not necessarily limited to, will need to have their calibration and/or sensitivity checked:

.1 Pressure transmitters
.2 Temperature sensors
.3 Current taps

.2 Dampers shall be checked for full range of operation.

.3 Control valves shall be checked for full range of operation and confirm that 3-way valves are piped correctly.

.4 Vapor tension, low limit thermostats (freeze stats) shall be checked for correct set point adjustment and installation across coil.

.4 SEQUENCE OF OPERATION VERIFICATION:

.1 Verify the systems sequences of operation by simulating all operating conditions that each system will operate under and verify that the correct sequence of operation is followed

.5 LOOP TUNING:

.1 All control loops shall be tuned. All loops shall respond with a dampened decay wave form to any change in set point.

.2 Loop tuning shall be verified and documented with trend logs.

.3 A multiple point trend log shall be created to verify the correct operation and tuning for every control loop in the system. The trend log sample rate shall be fast enough to indicate clearly the loop response to a set point and/or variable change.

.4 Submit documentation to Consultant and Commissioning Agency for review.

END OF SECTION 25 08 00

1 SCOPE OF WORK

.1 This specification outlines the standards for the DDC system's Operator's workstation(s) or head end computer that will be on site and includes hardware, software and specific operating performance.

1 DESIGN REQUIREMENTS

.1 An operator's workstation shall be provided ~~for all new building projects~~ and sufficient space in the mechanical room or a separate building operators office shall also be allocated for the workstation and associated drawings and maintenance manuals.

~~.2 On building additions, seismic upgrades and renovation projects, the mechanical consultant shall confirm with VSB Operations and the VSB Project Manager if an operator's workstation is required and/or if upgrading of an existing operator's workstation is required.~~

2 WORKSTATION HARDWARE

.1 Minimum hardware configuration shall be sufficient to allow for the display requirements of the web viewing portable.

3 WORKSTATION SOFTWARE.

.1 OPERATING SYSTEM.

.1 Each web server or workstation shall have an industry-standard professional-grade operating system such as Windows 10.

.2 SECURITY.

.1 Each operator shall be required to log on to the system with user name and password in order to view, edit, add, or delete data.

.2 Security levels shall be customizable to suit each individual user.

.3 OPERATOR ACCESS.

.1 The user name and password combination in conjunction with the customized security levels shall define accessible viewing, editing, adding, and deleting privileges for that operator.

.4 AUTOMATIC LOG OUT.

.1 Automatically log out each operator if no keyboard or mouse activity is detected.

.5 SYSTEM DIAGNOSTICS.

.1 The system shall automatically monitor the operation of all building management panels and controllers.

.2 The failure of any device shall be annunciated to the operator.

.6 ALARM PROCESSING.

.1 System input and status objects shall be configurable to alarm on departing from and on returning to normal state.

.2 Operator shall be able to enable or disable each alarm and to configure alarm limits, alarm limit differentials, alarm states, and alarm reactions for each system object.

.7 ALARM REACTIONS.

.1 Operator shall be able to configure (by object) what, if any actions are to be taken during an alarm.

.2 The workstation shall be able to log, print, start programs, display messages, send e-mail, send page, and audibly annunciate.

.8 ALARM AND EVENT LOG.

.1 Operators shall be able to view all system alarms and changes of state from any location in the system.

.2 An operator with the proper security level may acknowledge and delete alarms, and archive closed alarms to the workstation or web server hard disk.

.9 TREND LOGS.

.1 The operator shall be able to configure trend sample or change of value (COV) interval, start time, and stop time for each system data object and shall be able to retrieve data for use in spreadsheets and standard database programs.

.2 Controller shall sample and store trend data and shall be able to archive data to the hard disk.

.2 REMOTE COMMUNICATION.

.1 The system shall be accessible remotely through Internet/WEB, access, local network, or wide area network, telephone modem communications.

.1 Remote access shall provide full operational functionality of the DDC SYSTEM and integrated automation system.

.2 Appropriate security levels will be defined such that building operators will be enabled to manually configure setpoints, enable-disable points, speeds, and other points required for building operations. Operator logins will not be allowed to override inputs (AI, BI) signals, nor edit the control code.

1 EXECUTION

.1 GRAPHICAL USER INTERFACE

.1 Create a graphical user interface that has been custom designed to meet the requirements of the mechanical system and facility maintenance operations.

.1 Graphics shall be produced to the “VSB DDC Display Guidelines”

.2 TREND LOGGING

.1 Trend logs shall be created and stored at the controller level for each piece of equipment. Logical points shall be trended to facilitate the commissioning process.

.2 The frequency of pulling the trend logs from the control panel shall be often enough to prevent loss of data.

END OF SECTION 25 10 02

1 SCOPE OF WORK

.1 This specification outlines the standards for the filed control devices required for the DDC system and the integrated automation system.

2 PRODUCTS

.1 TEMPERATURE SENSORS

.1 SPACE TEMPERATURE SENSORS

.1 FLUSH MOUNT ROOM TEMPERATURE SENSOR PLATE

.1 The surface mounted, room temperature sensor shall consist of a 10K ohm thermistor epoxied to the back of a stainless steel cover plate

.2 SURFACE MOUNT, BLANK COVER SPACE TEMPERATURE SENSOR

.1 The surface mounted, blank cover, room temperature sensor shall consist of a vented cover, a 10K ohm thermistor, and a black plane that is affixed to a wall box recessed into the wall

.3 SURFACE MOUNT SPACE TEMPERATURE SENSOR C/W SETPOINT SLIDER,

.1 The surface mounted, room temperature sensor shall consist of a vented cover complete with a setpoint slider, a 10K ohm thermistor, and a black plane that is affixed to a wall box recessed into the wall

.2 Have a setpoint slider mounted at the bottom the sensor.

.2 DUCT TEMPERATURE SENSORS

.1 RIGID PROBE SINGLE POINT DUCT TEMPERATURE SENSORS

.1 The probe temperature sensor shall consist of a 10K ohm thermistor, a stainless steel probe jacket, and an electrical connection enclosure

.2 FLEXIBLE AVERAGING DUCT TEMPERATURE SENSORS

.1 The flexible averaging temperature sensor shall consist of a series of 1000 ohm platinum RTD sensor, a flexible copper jacket, and an electrical connection enclosure **NOTE: Direct Digital Controllers that are not capable of accepting a 1000-ohm RTD input directly into the panel shall interface the sensor with a 4-to-20 mA transmitter**

.3 IMMERSION TEMPERATURE SENSORS

.1 The probe temperature sensor shall consist of a 10K ohm thermistor, a stainless steel probe jacket, an electrical connection enclosure, a thermowell, and thermal conductive compound

.2 OUTDOOR AIR TEMPERATURE SENSOR

.1 The outdoor air temperature sensor shall consist of a 10K ohm thermistor, a weatherproof probe jacket, a weatherproof electrical connection enclosure, and a probe guard

.3 CARBON DIOXIDE SENSORS

.1 Acceptable Manufacturer: AIRTEST – No equals or alternates will accepted.

.2 The carbon dioxide sensor shall use a dual beam, infrared spectroscopy method to detect carbon dioxide levels in the air.

.3 The dual beam design shall provide an internal means of self- calibration that is not dependent on ambient CO2 levels reaching a low baseline for self-calibration.

.4 AIR PRESSURE SENSORS

.1 The air pressure sensor shall be a pressure transmitter with no moving parts to wear out.

.5 VAPOUR TENSION THERMOSTAT/FREEZESTAT (AUTO RESET)

.1 The vapour tension thermostat shall be used as a low limit thermostat to protect heating coils exposed to outdoor air streams from freezing and shall be auto reset type. (Air-handling units, unit ventilators, fan coils)

.2 The thermostat shall have a 2mm, vapour filled, copper capillary sensor. The sensor shall respond to the lowest temperature sensed along any 30cm section of the element.

.3 The thermostat shall be hard wired to shut down fan and fail heating water valve to full heat upon sensing a temperature below setpoint. The thermostat shall also be an auto reset type and be monitored by the DDC system.

.6 DAMPER ACTUATORS

.1 NOTE: Only one damper actuator is approved for ALL applications. The actuator is BELIMO MODEL AF24SRS. No equals or alternates will be accepted.

.2 The damper actuator shall be two-position or fully proportional to suit the application.

.3 Dampers actuators shall be spring return. The actuator mounting position shall determine clockwise or counterclockwise spring return rotation.

.7 CONTROL VALVES & ACTUATORS

.1 Unless otherwise specified, the use of BELIMO characterized ball valves will be used for all applications requiring valves that are ≤ 45mm in size.

.2 CONTROL VALVE ACTUATORS

.1 All control valve actuators shall be complete with actuator, valve linkage kit, and manual valve positioning handle. Only BELIMO, 2-10 VDC, proportionally controlled actuators are allowed for all applications except two position control.

.2 Control valve actuators shall accept a control signal range of 1Vdc to 10 Vdc.

.8 OCCUPANCY SENSORS

.1 The manufacturer shall warrant all components for a period of 5 years from the date of production, with the first two years unconditional

.2 Wall Mount Sensor

.1 Sensor shall utilize dual sensing verification principle for coordination between ultrasonic and PIR technologies Detection verification of both technologies must occur in order to activate output relay Upon verification, detection by either shall hold relay activation on

.3 Low Level Ceiling Mount Sensors (Lower than 3 Meters),

.1 Sensor shall utilize dual sensing verification principle for coordination between ultrasonic and PIR technologies Detection verification of both technologies must occur in order to activate output relay Upon verification, detection by either shall hold relay activation on

.9 CURRENT SENSORS

.1 The current sensors shall monitor line current for electrical loads such as pumps and fans and provide an output signal of 4-20 mA to represent the load

.2 The current tap shall not require an external power supply and shall be totally powered by induction from the AC load being monitored.

.10 BTU SUBMETERING

.1 BTU METER to be ONICON System – 10 BTU Meter.

.2 TEMPERATURE SENSORS

.1 Temperature sensors shall be loop-powered current based (mA), sensors and shall be bath-calibrated and matched (NIST* traceable), for the specific temperature range for each application. The calculated differential temperature used in the energy calculation shall be accurate to within +0.08°C (including the error from individual temperature sensors, sensor matching, input offsets, and calculations).

.3 FLOW MEASUREMENT METER

.1 The flow meter shall be installed either in the supply or return pipe of the system to be measured following the manufacturer's instructions and in a proper straight run of piping.

.4 FLOW SWITCHES

.1 Liquid Flow Switch

.1 The flow switch shall be a universal design for installation into a piping tee with a 25mm NPT pipe thread.
.2 The flow switch shall be complete with a minimum of four different length paddles for insertion into different line sizes.
.3 Paddles shall be constructed from stainless steel.

.2 Air Flow Switch

.1 Airflow switches shall be air blade "paddle" style with a paddle that fits in a 203mm diameter duct.
.2 The device shall be of brass, steel, and aluminum construction.
.3 The switch shall be single pole, double throw snap switch.

.11 POWER TRANSFORMERS

.1 All power transformers shall be Class 2, low voltage transformers.
.2 All transformers shall be the enclosed style. No open style transformers shall be acceptable.
.3 Transformers shall contain internal thermal protection.
.4 All power transformers shall be de-rated. The minimum de-rating factor shall be 25%.

.12 CIRCUIT BREAKERS

.1 Circuit breakers shall be miniaturized single pole thermal circuit breaker.

.2 The breaker shall be complete with a push-to-reset, tease free, trip-free, snap action mechanism.

.13 RELAYS

.1 Note: Only one style of relay should be used for all relay-controlled applications throughout the project. The relay shall be a two-piece assembly consisting of a socket base and a relay head and amperage rated to a minimum of 10 amps. *The use of miniature relays, potted relays, or circuit board mounted relays will not be accepted*.

.2 Relays shall be the general purpose, power relays. Standard of acceptance:

.1 Relay: OMRON MK-S Series Plugin Relay Head MKS2PI00*-*

.2 Base: OMRON PF083A-E

END OF SECTION 25 30 02

Sustainability Goals

1. *The DDC system shall allow facility management strategies to optimize overall energy consumption. Energy saving sequences of operation shall be incorporated into the design.*
2. *The use of CO2 monitoring for demand ventilation control and the use of occupancy sensor for system overrides and de-activation shall be incorporated where allowed.*
3. *Other strategies shall be incorporated where possible and suitable shall include;*
   - *Variable flow fans and heating water pumps*
   - *Reset control of chillers and boilers based on both outside air and demand.*
   - *Optimum start/stop of heating plants and air-handling systems.*
   - *Strategies for free cooling, mixing and heat recovery optimization.*
   - *Night time purge of building during shoulder season.*

1 DESIGN REQUIREMENTS

.1 ~~*Prior to tender and at 95% review stage the mechanical consultant shall*~~ *submit a complete DDC system points list and a detailed sequence of operation for each piece of mechanical equipment for review by the VSB. Refer to "Sequence of Operation" specification section. All temperature sensors, CO2 and occupancy sensor locations to be shown on the mechanical drawings. All DDC temperature and pressure sensors installed in piping to be shown on the mechanical piping schematics for coordination.*

.2 *Sequences of operation must be provided for each major piece of mechanical equipment and shall be proven sequences that are acceptable to the equipment manufacturer.*

.3 *Any sequences of operation for mechanical equipment which are not listed in these standard sequences are to be reviewed in detail with the VSB.*

.4 *All boiler and air-handling systems shall be provided with suitable supply reset strategies as a 1st method of energy savings.*

2 GENERAL SEQUENCES

.1 PRE-CODING MEETING

.1 Early in the development of the coding, and before any programs are loaded to the panels, the controls contractor and design engineer will meet with relevant VSB staff (heating department, energy management, etc.) to review the general coding philosophy and interpretation of the sequence of operations with respect to how it will be coded.

.2 OCCUPANCY SCHEDULING

.1 Weekly schedules shall be provided for each piece of mechanical equipment and major area of the building.

.2 Annual schedules shall also be provided to vary equipment operation during holidays and/or seasonal shut down.

.3 Temporary override schedules shall be provided to vary operations outside of normal occupied hours for each piece of equipment and major area of the building such as the Gymnasium.

.4 Spaces containing occupancy sensors shall have their occupancy status defined by the occupancy sensor.

.1 When the occupancy sensor is not activated for a period of fifteen minutes, (adjustable), it will clear a flag and the space is VACANT.

.2 When the occupancy sensor is activated, it will set a flag and the space is NON-VACANT.

.5 Override switches shall be provided in the Building Engineers office for overriding of the main air-handling systems in the building for both on and off control.

.3 TEMPERATURE SETPOINT SCHEDULING

.1 Spaces containing room temperature sensors with adjustable set points shall allow the occupants to adjust their set points in 0.5°C increments up to a maximum of ± 1.5°C above or below the occupied set point. Occupied set point as per table below.

.2 Room temperature set points shall revert to the default value regardless of the previous adjustment at the beginning of each occupied daily schedule.

.3 Building set points shall be defined as UNOCCUPIED, OCCUPIED. Building temperature set points shall be scheduled as follows:

	UNOCCUPIED	OCCUPIED
General Building Areas	15°C – Htg 35°C – Clg	21.0°C – Htg 23.0°C – Clg
Gymnasium	15°C – Htg 35°C – Clg	18.0°C – Htg 25.0°C – Clg
Classrooms	15°C – Htg 35°C – Clg	21.0°C – Htg 23.0°C – Clg

.4 The following are to be used for motion detector state.

	Schedule = ON, or Override = ON or Optimum start = ON	[Schedule = OFF AND Override = OFF AND Optimum start = OFF] Or Night setback = ON
Motion or occupancy detected	Occupied	Unoccupied
NO Motion or occupancy detected	"Stand by" (formerly called "Vacant" or "daytime setback")	Unoccupied

.5 Where room controls allow occupant to modify the set point, coding will be established to reset the set points to the default values at some point between midnight and 3 AM (i.e. prior to any possible optimum start initiation).

.4 TIMECLOCK SCHEDULING

.1 Sequence of Operation

.1 Building systems shall be controlled by an optimal start time clock that uses the optimal start feature for heating only.

.1 Early optimal start times shall be limited to a maximum of three (3) hours prior to scheduled occupancy time.

.2 The operating schedule shall be:

.1 Monday to Friday:

.1 07:30 AM to 03:00 PM OCCUPIED

.2 03:01 PM to 07:29 AM UNOCCUPIED

.2 Weekends:

.1 UNOCCUPIED

.2 The system shall provide an annual holiday schedule that will override the optimal start time clock schedule operation and maintain the building in UNOCCUPIED mode.

.3 Time clock scheduling shall be overridden and the required mechanical systems operation shall be cycled to maintain the minimum unoccupied building temperatures during unoccupied mode.

.4 Time clock scheduling shall be overridden for a predetermined time interval when the local override button located in the building Engineers Office activated.

.2 Graphics

.1 Provide a complete system graphic for the scheduling interface to show each of the time clock and current schedule status. Provide links to operating schedules.

.5 LIGHTING CONTROL

.1 Systems and Equipment

.1 Delta Lighting Controller (Installed by Division 26)

.2 Refer to Division 26 specification for lighting control sequence of operation.

.2 Graphics

.1 Provide a complete system graphic of the exterior and interior lighting control system with each floor plan of the building identified and graphic representation of lighting modes of operation. Show all interior and exterior lighting zones and provide links to operating schedules.

.3 Sequence of Operation

.4 Provide interface between the low voltage lighting control system and the DDC system and cooperate with the Division 26 contractor.

.5 Provide a BACnet interface network connection to each low voltage lighting control cabinet and provide necessary programming for monitoring and controlling devices.

.6 A relay cabinet for all PIR's from classroom and various other spaces throughout the school will be located in the electrical room, provided and installed by Division 26. The DDC system shall monitor the status of each relay for communication to the lighting control panel.

.7 Daylight sensors will also be wired to relay cabinets provided and installed by Division 26.

.8 Daylight sensors shall be programmed to turn lights off in designated areas within day lighting zone of associated lighting.

.9 PIR's in classrooms shall be programmed to turn lights off in classroom when there has been no detectible activity for 15 minutes. Turning lights on shall be by local low voltage switch provided and installed by Division 26.

.10 PIR's in select rooms such as washrooms, storage rooms and other areas shall be programmed to run lights off when there has been no detectible activity for 30 minutes and shall turn lights on when activity s detected.

.6 ENERGY METERING

.1 Systems and Equipment

.1 Electrical Energy meters provided by Division 26 00 00.
.2 BTU meters provided by this section.

.2 Graphics

.1 Prepare a separate DDC system graphics page displaying real time and historic metering data. In addition, display electrical meter building power usage and building gas meter usage on same graphic.

.3 Sequence of Operation

.1 Provide the following connections to power meters provided by Division 26 00 00:

.1 Main Power Meter pulse and Ethernet connection.

.2 Provide pulse and Ethernet connection to the digital gas meter.

.3 In general BTU meters, which will be used to monitor the performance of the heating and cooling system in the building. The number of BTU meters should be sufficient to differentiate between heating, cooling and domestic heating usage.

.7 MAKE-UP WATER METERING

.1 Systems and Equipment

.1 Provide connection to pulsed output make-up water meters provided by mechanical contractor and indicate make up water consumption on system graphic.

.8 TRAP PRIMERS

.1 Sequence of Operation

.1 The DDC system shall cycle the trap primer water feed control valve once every 12 hours to maintain a water seal in the plumbing system traps.

.9 CENTRAL AIR HANDLING UNITS

.1 Sequence of Operation

.1 Start-up and shutdown of the unit will be controlled by DDC schedule.

.2 Include supply air temperature controller to determine unit supply calculated from average room temperature, outside air temperature, high room variance, low room variance, and room temperature setpoint.

.3 Use of the mixed air dampers in economizer mode shall be utilized as a means of maximizing free cooling.

.4 Provide optimum start calculation to bring room temperatures up to day setpoint for the start of the occupied schedule start time. Optimum start calculated start time variable shall hold start time value for that day.

.5 Minimum outdoor air position is to be re-set by a carbon dioxide sensor located in the return air duct or space set to modulate the outdoor and

return air dampers to maintain a maximum CO2 level of 900 PPM or lower.

.6 If the air-handling unit supply fan is variable speed the supply fan speed shall be based on duct static pressure which is located 2/3 downstream of the main supply air duct. Duct static shall be based on calibration from the balancing agent.

.7 The speed of the supply fan shall be varied to maintain a discharge static pressure set point.

.1 The static pressure set point shall be determined by the balancing agent to maintain air flow to the furthest VAV box.

.2 The static pressure sensor is to be located 2/3's of the way down the longest duct run.

.8 On start-up of the unit, when in heating mode, run with the heating coil control valve fully open, the circulating pump running and the outdoor air damper fully closed for a minimum of ten minutes or until room temperatures meet set point.

.9 The heating coil circulating pump is to run whenever any control valve is open to heating or whenever outdoor temperature is lower than 4 °C.

.10 Provide inlet air temperature sensor to modulate heating coil pump to prevent coil freeze-up.

.11 Freezestat controls shall switch the power to both mixed air damper and heating valve actuator to allow these devices to spring-return to a fail-safe position.

.12 Provide mixed air damper ramp calculation.

.13 Provide separate controller points for heating control valve and mixed air damper actuator (no split-range control).

.14 Modulate the mixed dampers, heating water coil and cooling coil in sequence to maintain discharge air temperature set point. The discharge air temperature set point shall be 16 °C and shall be further reset based on heating/cooling demand. Reset shall occur at 1 °C every 30 minutes. Minimum and maximum discharge air set points shall be adjustable.

.15 A night time purge (NTP) cycle shall be incorporated into the operation and described in the sequence of operations document. The objective of the NTP shall be to cool the building using cool evening or late night air when the daytime room temperatures have exceeded set point and have not declined to near set point by the end of the evening (e.g. by midnight). The purge cycle shall be defined by the consultant (VSB will provide input as desired) and may be site specific depending on the nature of the facilities and equipment. Considerations to be addressed in the NTP sequence of operations shall include:

.1 Defining the 'trigger for a purge cycle'. Typically this would be if a threshold number of rooms are above the cooling set point, or the average is some number of degrees above the desired set point at the end of the day and/or at some late night time.

.2 Whether the OAT is sufficiently cool to provide effective cooling.

.3 Consideration if there are any unenclosed mechanical systems and the local neighbourhood that may affect the suitability, or design, of a NTP cycle. The sequence should address these.

.4 Downstream devices (e.g. VAV boxes) must be taken into consideration as to their operation in a NTP (e.g. whether air damper or fan systems need to be activated in order to achieve an effective NTP cycle).

.5 Mechanical cooling systems (if available) should be avoided for use in a NTP.

.6 No roof top heat pump system should be deployed in a NTP.

.7 All setpoints for triggers and conditions for starting and stopping a NTP (e.g. ave RT, number of rooms, OAT, start time) should be coded as variables to allow for ease of future tuning

.10 AIR HANDLING UNITS (CONSTANT VOLUME)

.1 Sequence of Operations

.1 Start-up and shutdown of the unit will be controlled by DDC schedule.

.2 Include supply air temperature controller to determine unit supply calculated from average room temperature, outside air temperature, high room variance, low room variance, and room temperature set point. Summer/winter set points of 16/18°C shall be starting point.

.3 Use of the mixed air dampers in economizer mode shall be utilized as a means of maximizing free cooling.

.4 Provide optimum start calculation to bring room temperatures up to day setpoint for the start of the occupied schedule start time. Optimum start calculated start time variable shall hold start time value for that day.

.5 Minimum outdoor air position is to be re-set by a carbon dioxide sensor located in the return air duct set to modulate the outdoor and return air dampers to maintain a maximum CO2 level of 900 PPM or lower.

.6 On start-up of the unit, when in heating mode, run with the heating coil control valve fully open, the circulating pump running and the outdoor air damper fully closed for a minimum of ten minutes or until room temperatures meet set point.

.7 The heating coil circulating pump is to run whenever any control valve is open to heating or whenever outdoor temperature is lower than 4 °C (40 °F).

.8 Provide inlet air temperature sensor to modulate heating coil pump to prevent coil freeze-up.

.9 Freezestat controls shall switch the power to both mixed air damper and heating valve actuator to allow these devices to spring-return to a fail-safe position.

.10 Provide mixed air damper ramp calculation.

.11 Provide separate controller points for heating control valve and mixed air damper actuator (no split-range control).

.12 Modulate the outside air damper and heating water control valve in sequence to maintain discharge air temperature. Discharge air temperature shall be 16 °C and shall be further reset based on heating or free cooling demand in the shop area.

.13 A night time purge (NTP) cycle shall be incorporated into the operation and described in the sequence of operations document. The objective of the NTP shall be to cool the building using cool evening or late night air

when the daytime room temperatures have exceeded set point and have not declined to near set point by the end of the evening (e.g. by midnight). The purge cycle shall be defined by the consultant (VSB will provide input as desired) and may be site specific depending on the nature of the facilities and equipment. Considerations to be addressed in the NTP sequence of operations shall include:

.1 Defining the 'trigger for a purge cycle'. Typically this would be if a threshold number of rooms are above the cooling set point, or the average is some number of degrees above the desired set point at the end of the day and/or at some late night time.

.2 Whether the OAT is sufficiently cool to provide effective cooling.

.3 Consideration if there are any unenclosed mechanical systems and the local neighbourhood that may affect the suitability, or design, of a NTP cycle. The sequence should address these.

.4 Downstream devices (e.g. VAV boxes) must be taken into consideration as to their operation in a NTP (e.g. whether air damper or fan systems need to be activated in order to achieve an effective NTP cycle).

.5 Mechanical cooling systems (if available) should be avoided for use in a NTP.

.6 No roof top heat pump system should be deployed in a NTP.

.7 All setpoints for triggers and conditions for starting and stopping a NTP (e.g. ave RT, number of rooms, OAT, start time) should be coded as variables to allow for ease of future tuning

.11 PERIMETER SPACE HEATING – TERMINAL UNITS:

.1 Sequence of Operations – perimeter convector

.1 Modulate heating water control to maintain space temperature set point.

.12 VAV BOX (TYPICAL)

.1 Sequence of Operation

.1 Each VAV box shall modulated from minimum to maximum position to maintain room CO2 levels at 900ppm. In addition, VAV box shall modulate to maintain room temperature set point for cooling. Minimum airflow rate of all VAV boxes is 40% of maximum flow.

.2 For VAV boxes with re-heat coils the heating water control valve shall modulate to maintain discharge air temperature set point at the VAV box.

.13 CLASSROOM UNIT VENTILATORS

.1 Sequence of Operations

.1 Start-up and shutdown of the units will be controlled by DDC schedule.

.2 Each of the units has integral heating and possible cooling coils, for which the control valves will modulate in sequence with the mixed air dampers to maintain discharge air temperature set point.

.3 The supply air temperature set point of the unit ventilator shall be modulated based on the heating and cooling demand in the classroom space.

.4 Each unit has outdoor and return air dampers and actuators installed by the manufacturer. Use the mixed air dampers in economizer mode to provide free cooling when possible.

.5 Minimum outdoor air position is to be re-set by a carbon dioxide sensor located in the return air plenum, set to modulate the outdoor and return air dampers to maintain a maximum space CO2 level of 900 PPM.

.6 On initial daily start-up of units run with the heating coil control valve fully open and the outdoor air dampers fully closed for a minimum of ten minutes when outside air temperatures are 10 °C or lower or until room temperature set point is reached.

.7 Freeze thermostat trip out to immediately shut down the supply air fan and close the outdoor air damper, as well as initiate a system alarm. Freeze stat shall be auto reset type.

.8 Provide optimum start calculation to bring room temperature up to day setpoint for the start of the occupied schedule start time. Optimum start calculated start time variable shall hold start time value for that day.

.9 A night time purge (NTP) cycle shall be incorporated into the operation and described in the sequence of operations document. The objective of the NTP shall be to cool the building using cool evening or late night air when the daytime room temperatures have exceeded set point and have not declined to near set point by the end of the evening (e.g. by midnight). The purge cycle shall be defined by the consultant (VSB will provide input as desired) and may be site specific depending on the nature of the facilities and equipment. Considerations to be addressed in the NTP sequence of operations shall include:

.1 Defining the 'trigger for a purge cycle'. Typically this would be if a threshold number of rooms are above the cooling set point, or the average is some number of degrees above the desired set point at the end of the day and/or at some late night time.

.2 Whether the OAT is sufficiently cool to provide effective cooling.

.3 Consideration if there are any unenclosed mechanical systems and the local neighbourhood that may affect the suitability, or design, of a NTP cycle. The sequence should address these.

.4 Downstream devices (e.g. VAV boxes) must be taken into consideration as to their operation in a NTP (e.g. whether air damper or fan systems need to be activated in order to achieve an effective NTP cycle).

.5 Mechanical cooling systems (if available) should be avoided for use in a NTP.

.6 No roof top heat pump system should be deployed in a NTP.

.7 All setpoints for triggers and conditions for starting and stopping a NTP (e.g. ave RT, number of rooms, OAT, start time) should be coded as variables to allow for ease of future tuning

.14 DDC CONTROLLED EXHAUST FANS (TYPICAL)

.1 Sequence of Operation

.1 Each of the exhaust fans will be enabled by DDC schedule separately and have a status point on the DDC system graphics.

.2 Some fans, which are also manually switched within the space they are serving, will also have DDC supervisory control and will be enabled and disabled based on the building schedule.

.3 The exhaust fan damper shall open. A damper end switch shall indicate when the damper is open and start the fan.

.15 HYDRONIC PLANT

.1 Sequence of Operation

.1 Start-up and shutdown of the system will be controlled by DDC schedule. On a call for heating enable the main heating water pumps and primary boiler.

.2 The DDC system should include 2 outdoor air temperature sensors and survey building heating requirements to provide the boiler system with 0-10V reset signal.

.3 DDC shall provide individual Boiler Fault/Tripped status directly through hard wired connection between boilers and DDC control. DDC shall not rely on a BACNet transfer for boiler fault/trip.

.4 DDC shall monitor the supply temperature of each boiler through a temperature sensor located on the boiler supply all the times.

.5 DDC shall monitor the HWS & HWR temperature through a temperature sensors located on the main supply and return piping of the boiling heating system all the times.

.6 The DDC system shall monitor the fire rate of each boiler module through the BACnet interface and display the firing rate on the main boiler system graphic.

.7 The hydronic plant shall include a hot water supply temp (HWSP) reset signal. The logic for this signal will be described in the sequence document and shall be compatible with the heat provision equipment (e.g. HP, boiler, etc) as well as the nature of the terminal equipment. Preference is for a reset protocol based on monitoring parameters within the building and to not rely solely upon OAT. Sequences that define a reset based on some form of building demand are to explicitly define the designer's intent of how the demand is to be calculated (e.g. return water temp, ave room temp, number of rooms below set point, number of valves open, etc.).

.8 The reset signal shall be sent to the boiler master/cascade controller to reset the boiler water supply temperature.

.1 Upon demand for the heat plant, the DDC shall enable the lead main pump (P-1 or P-2) and confirm its operation for 5 min (adjustable) before sending a signal to the hydronic cascade boiler controller to fire the boilers.

.2 Upon confirming the status of the lead main pump operation, the DDC shall output a temperature reset signal to the cascade boiler controller in correspondence to the present HWST SP (determined by OAT reset schedule above).

.3 Condensing boilers will be operated by a manufacturer supplied cascade controller. Individual firing rate will be set by individual boiler control, based on the cascade control reset signal. The boiler control shall self-adjust to varying operating environments and shall have priority for both electric and fuel savings in its self-learning, self-adaptive logic.

.4 The DDC input to the cascade control shall change the desired set point no faster than 2°C per minute, unless going into shut down.

.5 All alarm points of the cascade control shall be wired back to DDC control.

.16 DOMESTIC HOT WATER RECIRCULATION PUMP

.1 Sequence of Operation

.1 Domestic hot water recirculation pumps will be enabled by DDC schedule and return water temperature sensor.

.2 When domestic water return temperature has reached set point then shut off pump. Restart pump only when return water temperature sensor is 5°C below set point.

.17 BOILER EMERGENCY SHUTDOWN SWITCH

.1 Sequence of Operation

.1 The controls contractor shall supply and install a manually operated switch at each entrance/exit point to the boiler room. Upon activation of the switch, all power supplies to all of the boilers and hot water heaters in the room shall be killed.

.2 The switch shall be a mushroom style with a red operator button and be complete with DPDT contacts. One set of contacts shall be wired to kill power to all of the boilers in the room. The second set of contacts shall be monitored by the DDC system. The DDC system shall initiate an alarm when the switch is activated.

.3 The switch shall be mounted local to the entrance/exit door at a level five feet above the finished floor height.

END OF SECTION 25 90 01

VSB Building Standards Mechanical (BSM)
Update Bulletin 2019-01-mech (rev)
Dated: Oct 11, 2019

The currently issued VSB Mechanical Building Standards were issued for release on May 8, 2019.

This bulletin identifies a compilation edits that have been identified and will become incorporated into a future revision of the standard. These items encompass (1) technical clarifications and requirements, and (2) correction of editorial and typographic errors.

This bulletin is to be interpreted within the context of the VSB Mechanical Building Standards. As of the date of this notice, these revisions are considered in force and a requirement of the VSB Building Standards. These edits will be formally incorporated into the standards document at a future date.

Bulletin 2019-01-mech: Revisions to VSB Mechanical Building Standards

Section	Bullet	Change
various	Numbering issues	A few sections have been identified in which the sub-section bullet numbering may not increment suitably (e.g. within a section, several bullets may be numbered “1”). This does not affect any technical content, however, this may cause confusion when referencing sections. Until a subsequent revision can correct all section numbering, users should note if a section they are using has this issue, and if so, be sure to identify any questions by referring to the specific bullet and the title of the bullet.
22 05 00	S8 System Demonstration to VSB	Bullet added: “S8.5 The mechanical contractor is to supply a complete list of all the backflow preventers, their locations, and the area of the facility that they protect.”
23 20 00 23 73 00	S2.5 balancing valves S3.3 Coils.	Clarification bullet added to one or both sections as appropriate: “Sx.x Balancing valves shall be located on the outlet side of coils and control valves on the inlet side”.

Section	Bullet	Change
23 05 00 (or more specific section as appropriate)	New bullet	Clarification bullet added: "As defined by the VBBL reference to the Canadian Electrical Code: "where heating, ventilating, air-conditioning, and similar equipment is installed on a rooftop, and least one electrical receptacle shall be installed. This is to be installed in accordance with the electrical code."
23 05 00	S2.7. S2.8, and S2.9	A new bullet added after S2.9: "S2.x For large height spaces, the ventilation rates and air change requirements of S2.7, S2.8, and S2.9 are to be designed based on a nominal (of functional height) of 12 feet. For an auditorium space with inclined seating, the plan view room area is assumed to be a floor area for these calculations."
23 34 00	S5.5 Ceiling propeller fans…	Transcription correction. The bullet titled: ".5 CEILING PROPELLER FANS (GYMNASIUM) CF-1 TO CF-8 & (ART ROOM) CF-9" is changed to read as: ".5 CEILING PROPELLER FANS"
23 34 00	S5.5 Ceiling propeller fans…	Bullets added: S5.5.3. Ceiling fans are prohibited for secondary school gymnasiums and must be approved in advance by the VSB for other spaces in secondary schools. ~~S5.5.4. Ceiling fans for elementary school spaces must be approved in advance by the VSB.~~
23 52 00	S2.3	The text within this bullet reading: "…each sized for 60% of the design heating load…" Is changed to read: "…each sized for 75% of the design heating load…"

Section	Bullet	Change
23 64 00 (ASHP)	S2.6 design Requirements	The bullet is changed to read: "S2.6 The design will include a buffer tank on the glycol side of the heat exchangers (one each on both the heating and cooling side) in order to minimize rapid temperature oscillations to the HP during operation. Buffer tank shall be sized to manufacturer's recommendations. The design 'available volume' to check against manufacturer's specifications is defined as: Available volume = usable buffer tank volume + 50% of the estimated piping volume of the glycol loop. A separate calculation is required for each side (heating and cooling) of the heat pump."
23 64 00 (ASHP)	S5.3 Start-up and commissioning	Bullet added after S5.3.2: "S5.3.x A pre-commissioning meeting will be held with the manufacturer's equipment commissioning technician, the commissioning agent, the controls contractor, the design engineer, and suitable VSB staff. The purpose will be to review the sequence of operations and confirm the operating strategy for the equipment."

VANCOUVER SCHOOL BOARD

BUILDING STANDARDS MANUAL

ELECTRICAL STANDARD

EDITION 6

FEBRUARY 18, 2019

FOR GENERAL RELEASE

Edited June 07, 2019 for Eric Hamber Secondary School Replacement Project

Second edit October 30, 2019

Third edit November 06, 2019

Fourth edit February 18, 2020

LIST OF CONTENTS

EDITION HISTORY

EDITION	RELEASE DATE	VSB COORDINATOR	NOTE
1	2016 04 18	NOEL MCNALLY	FOR INTERNAL REVIEW
2	2016 08 31	NOEL MCNALLY	FOR INTERNAL REVIEW
3	2016 11 28	NOEL MCNALLY	FOR INTERNAL REVIEW
4	2017 02 08	NOEL MCNALLY	FOR GENERAL RELEASE
5	2018 09 01	ERNEST FANTHORPE	FOR GENERAL RELEASE
6	2019 02 18	ERNEST FANTHORPE	FOR GENERAL RELEASE

LIST OF REVISIONS TO EDITION 5

1 SECTION 12 46 19 (Clocks) - This section has been deleted. Clocks must be integrated with the audio system. Clock information is now provided in Section 27 50 00 (Audio System).

2 SECTION 26 50 00 (Lighting) - The prohibition against wall and step mounted luminaires which are to be recessed in concrete or masonry has been conditionally lifted. These luminaires may now be used provided that authorization is obtained from the VSB Electrical Supervisor.

3 SECTION 26 50 00 (Lighting) - Lighting control details for gymnasia have been simplified.

4 SECTION 26 50 00 (Lighting) - Specifications has been added for parking area lamp standards.

5 SECTION 27 10 00 (Telecom Cabling) - Relevant parts of the document entitled "Technical Standards for Structured Cabling Installed in New Buildings" (dated October 7, 2017) have been integrated with the Telecom Cabling section.

"Technical Standards for Structured Cabling Installed in New Buildings" (the standard used by the VSB Learning and Information Technology Division) will become dormant following the release of this edition of the VSB Electrical Standard.

6 SECTION 27 50 00 (Audio System) - Clocks must now be integrated with the audio system. Clock information has been added to this section.

7 SECTION 27 50 00 (Audio System) - Miscellaneous audio system details have been revised.

ASSURANCE OF COMPLIANCE WITH VSB ELECTRICAL STANDARD

TO: The Manager of Facility Development
Vancouver Board of Education

FROM: _____
Name of Electrical Engineer of Record

_____
Name of Consulting Firm

_____
Address of Consulting Firm

_____
Phone Number of Consulting Firm

RE: _____
Project Name

_____
Project Location

I hereby give assurance that all design documents produced by my firm will conform to the VSB Electrical Standard with edition number and date as indicated in the header of this letter.

_____ _____
Signature Date

NOTE: Prior to the start of any design activity, the Electrical Consultant must designate a staff member to act as the Electrical Engineer of Record for the project. The staff member, on behalf of the Electrical Consultant, must complete this letter template and submit it to the VSB Project Manager.

ABBREVIATIONS & ACRONYMS

AFF	ABOVE THE FINISHED FLOOR
CSA	CANADIAN STANDARDS ASSOCIATION
EMT	ELECTRICAL METALLIC TUBING
ENT	ELECTRICAL NON-METALLIC TUBING
FT4	FLAME TEST RATING 4
FT6	FLAME TEST RATING 6
LED	LIGHT EMITTING DIODE
LCD	LIQUID CRYSTAL DISPLAY
POE	POWER OVER ETHERNET
PVC	POLYVINYL CHLORIDE
RPVC	RIGID POLYVINYL CHLORIDE
ULC	UNDERWRITERS LABORATORIES OF CANADA
V	VOLT(S)
VSB	VANCOUVER SCHOOL BOARD
WAP	WIRELESS ACCESS POINT
XLPE	CROSS-LINKED POLYETHYLENE

DEFINED TERMS

1 GENERAL TERMS

AS REQUIRED - When used to characterize a scope of work, AS REQUIRED means that the scope of work must be performed if, as a result of not performing the work, a product or system (associated with the scope of work) will not be complete and functional.

AUDIO ZONE - An area served by one or more audio speakers which can be functionally isolated from all other speakers.

BC ELECTRICAL CODE - The Canadian Electrical Code with BC amendments.

CABLE ASSEMBLY - A cable and the associated terminations.

COMMON AREA - A main corridor, vestibule, commons, stairway, or other area used to facilitate the movement of people within a building.

DAMP LOCATION - An exterior or interior location that is normally or periodically subject to condensation or other forms of moisture and includes partially protected locations under canopies, marquees, and roofed open porches.

DRY LOCATION - A location not normally subject to dampness.

ELECTRICAL ENCLOSURE - An enclosure with a CSA enclosure designation.

EXISTING - Present at the indicated location prior to construction.

FIRE-RESISTANCE RATING - A rating which specifies the time in minutes or hours that a material or assembly of materials will withstand the passage of flame and the transmission of heat when exposed to fire under specified conditions.

FIRE SEPARATION - A construction assembly that acts as a barrier against the spread of fire. (A fire separation can have a fire resistance rating or it can be unrated.)

FIREWALL - A type of fire separation of noncombustible construction which subdivides a building to resist the spread of fire and which:

(a) has a fire-resistance rating;

(b) is designed to remain structurally stable under fire conditions for the rated time.

FLAME TEST RATING - A rating defined in CSA Standard C22.2 No. 0.3 "Test Methods for Electrical Wires and Cables".

HAZARDOUS LOCATION - A location where:

(a) an explosive gas atmosphere is present, or may be present, in quantities that require special precautions for the construction, installation, and use of electrical equipment; or

(b) combustible dusts are present, or may be present, in the form of clouds or layers in quantities that require special precautions for the construction, installation, and operation of electrical equipment; or

(c) combustible fibres or flyings are manufactured, handled, or stored such that special precautions are required for the construction, installation, and operation of electrical equipment.

INSTALL - Unless noted otherwise in this standard, INSTALL means (where applicable) unpack, assemble, place, support, fasten, wire, connect, configure, program, commission, and make complete and functional.

LIGHTING ZONE - An area served by one or more luminaires which can be functionally isolated from all other luminaires.

NEW - When applied to a product, this means that the product is:

(a) unused;

(b) available in the original factory packaging;

(c) manufactured within the 12-month period prior to the start of construction.

ORDINARY LOCATION - A dry location where, at normal atmospheric pressure and under normal conditions for that location, electrical equipment is not unduly exposed to damage from:

(a) mechanical causes;

(b) excessive dust;

(c) moisture;

(d) extreme temperatures;

(e) corrosive liquids or vapours;

(f) flammable liquids or vapours;

(g) explosive atmospheres.

OUTDOOR LOCATION - A location exposed to the weather.

OUTLET - An assembly which includes a box, a cover or coverplate, fasteners, and one or more devices and/or connectors. An outlet may also include an interior partition, a mud ring, one or more gaskets, and other accessories.

PROVIDE - Supply and install.

RACEWAY - Infrastructure which provides a totally enclosed pathway intended to support and protect conductors.

Raceway components may include conduit, tubing, duct, wireway, connectors, couplings, fittings, fasteners, clamps, adapters, device boxes, outlet boxes, pull boxes, splice boxes, junction boxes, supports, hangers, steel framing elements, pull cords, and other associated items.

REMOVE - Unless noted otherwise in this standard, this means de-energize, disconnect, disassemble, unfasten, and take away.

SUPPLY - This means (unless noted otherwise in this standard):

(a) purchase;

(b) transport to site;

(c) protect:

(d) temporarily store;

(e) make available at the required location at the required time.

WET LOCATION - A location where liquids may drip, splash, or flow on or against electrical equipment. An underground location within a building footprint must be considered as a wet location. Any location within concrete or masonry, where the concrete or masonry is at or below grade level, must be considered as a wet location.

2 NOTE ON THE WORD 'ELECTRICAL'

The document entitled "Masterformat Numbers and Titles" produced jointly by the Construction Specifications Institute (CSI) and Construction Specifications Canada (CSC) assigns the title "Electrical" to Division 26. This title is unfortunate because it implies that work falling outside the scope of Division 26 is not "Electrical". (Division 26 should have been called "Electric Power and Lighting".)

The word "Electrical" in the title "VSB Electrical Standard", refers to a wide range of electrically related infrastructure. It does not refer solely to infrastructure described in MasterFormat Division 26.

APPLICATION OF THIS STANDARD

No part of this standard relieves the Electrical Consultant of responsibility to produce complete and comprehensive design documents.

No part of this standard may be used as a stand-alone specification.

The Electrical Consultant must ensure that all relevant requirements contained in this standard are incorporated into the electrical design documents.

~~Prior to the start of any design activity, the Electrical Consultant must designate a staff member to act as the Electrical Engineer of Record for the project. Prior to the start of any design activity, that staff member must complete the letter template at the end of this standard entitled "Assurance of Compliance With VSB Electrical Standard" and submit it to the VSB Project Manager.~~

PRINCIPLES AND ENERGY EFFICIENCY

1 INTRODUCTION

.1 The VSB operates and maintains a 'fleet' of over 100 facilities. The design of a school facility profoundly affects the learning activity which takes place within that facility. Children in various stages of development are stimulated by light, color, the scale of their surroundings, and even by the navigational aspects of their environment. Children can also react negatively to adverse environmental conditions.

.2 New school design must optimize the learning environment and facilitate efficient operation and maintenance. Efficient and innovative designs are encouraged, but the designers should appreciate and be informed by the products, systems, staff, and skills deployed by the VSB. In some cases, design flexibility will be allowed. In other cases, design standardization will be required.

.3 The expected service life of a typical school building is 50 years. The mechanical and electrical systems must be designed around maximum efficiency for the September to June educational calendar, however; the design should address the possibility of a 12-month school calendar.

.4 New technologies may be explored. However, these need to be proven and must add value to the facility – either through lower capital cost, lower life cycle cost, or through enhanced educational opportunities.

2 DESIGN PRINCIPLES

.1 A number of Provincial, Municipal, and District policies define the parameters within which a school facility must be designed. Overall, the District strives to create facilities that:

(a) are cost effectively planned, designed, constructed, and operated;

(b) provide a superior learning environment;

(c) are durable and long lasting;

(d) are easy to maintain and repair;

(e) are highly energy efficient; and

(f) produce minimal levels of greenhouse gas.

~~3 ENERGY EFFICIENCY REQUIREMENT~~

~~.1 Each new school must be designed to target a level of energy efficiency that is in the top 10% or better of the existing school fleet. Energy performance will be measured as kilowatt-hours (kWh) of annual energy consumption (combined for~~

~~electricity, natural gas and/or other sources) per square meter of interior floor space.~~

~~.2 The VSB Energy Manager will maintain and periodically update a target level for elementary schools and a target level for secondary schools. Prior to the start of design activity, the Electrical Consultant (and the Mechanical Consultant), must obtain the relevant target level and use it as a design benchmark.~~

SECTION 01 99 50
GENERAL ELECTRICAL REQUIREMENTS

1 PRIME DIRECTIVES

.1 Each person who performs electrical work must be "qualified" to do so as defined in the WorkSafeBC Occupational Health and Safety Regulation and in the Electrical Safety Regulation (which is part of the BC Safety Standards Act).

.2 Unless noted otherwise in this standard, all supplied products and systems must be new, undamaged, and non-defective.

.3 Unless noted otherwise in this standard, each supplied product and system must be handled, installed, and commissioned in accordance with the recommendations and requirements of the associated manufacturer.

.4 Unless noted otherwise in this standard, each installed product and system must be made complete and functional.

.5 All electrical work must be performed expeditiously and to a high professional standard.

.6 During construction, each electrical product and system susceptible to damage and/or contamination must be adequately protected.

2 LEGAL REQUIREMENTS

.1 All electrical work must be performed in accordance with:

(a) The Vancouver Electrical By-law;

(b) The BC Electrical Code;

(c) all electrical bulletins and notices issued by the City of Vancouver which are currently in force;

(d) the Vancouver Building By-law;

(e) all WorkSafeBC Occupational Health and Safety Regulations;

(f) all other legal requirements in force at the project location.

3 STANDARDS

.1 Where a standard is identified in this document without an edition date, the latest edition of the standard (as of the date of this document) must be utilized unless a legal document requires otherwise. In the latter case, the legally required edition must be utilized.

.2 Where a standard is identified in this document (and the edition is selected as described above):

(a) each supplied product which falls under the scope of the identified standard must be certified to that standard (where an associated certification program exists);

(b) work which falls under the scope of the standard must be undertaken in conformance with the standard.

4 PERMITS

.1 Prior to the start of electrical work, an electrical permit must be obtained from the City of Vancouver. The electrical permit must cover all aspects of the electrical work.

5 BC HYDRO

.1 Where a new or modified BC Hydro service is required for a project, the Electrical Consultant must establish contact with BC Hydro early in the design stage.

The Electrical Consultant must:

(a) identify all BC Hydro application requirements;

(b) fulfill all BC Hydro application requirements ~~(except those requirements regarding the remittance of application fees)~~;

~~(c) arrange for the VSB to pay for all required application fees;~~

~~(d) obtain a written cost estimate from BC Hydro and forward this to the VSB Project Manager;~~

~~(e) facilitate the payment (by the VSB) of any design and service fees specified in the estimate;~~

(f) obtain from BC Hydro ~~(and distribute to the design team and the VSB Project Manager)~~ a preliminary design drawing showing all relevant BC Hydro infrastructure;

(g) facilitate municipal approval of the preliminary design drawing provided by BC Hydro;

(h) obtain from BC Hydro ~~(and distribute to the design team and the VSB Project Manager)~~ an approved and final design drawing showing all relevant BC Hydro infrastructure.

.2 The Electrical Drawings and/or Electrical Specifications must clearly describe all work which must be executed by the Electrical Contractor in support of the new or modified BC Hydro service. (This includes all civil work on VSB property.)

All such work described on the Electrical Drawings and/or in the Electrical Specifications must be in strict conformance with BC Hydro standards.

6 TELUS

.1 Where a new or modified Telus service is required for a project, the Electrical Consultant must establish contact with Telus early in the design stage.

The Electrical Consultant must:

(a) identify all Telus application requirements;

(b) fulfill all Telus application requirements ~~(except those requirements regarding the remittance of application fees)~~;

~~(c) arrange for the VSB to pay for all required application fees;~~

~~(d) obtain a written cost estimate from Telus and forward this to the VSB Project Manager;~~

~~(e) facilitate the payment (by the VSB) of any design and service fees specified in the estimate;~~

(f) obtain from Telus ~~(and distribute to the design team and the VSB Project Manager)~~ a preliminary design drawing showing all relevant Telus infrastructure;

(g) facilitate municipal approval of the preliminary design drawing provided by Telus;

(h) obtain from Telus ~~(and distribute to the design team and the VSB Project Manager)~~ an approved and final design drawing showing all relevant Telus infrastructure.

.2 The Electrical Drawings and/or Electrical Specifications must clearly describe all work which must be executed by the Electrical Contractor in support of the new or modified Telus service. (This includes all civil work on VSB property.)

All such work described on the Electrical Drawings and/or in the Electrical Specifications must be in strict conformance with Telus standards.

7 COORDINATION WITH OTHER WORK

.1 Electrical work must be coordinated with all relevant parties to ensure that products and systems installed as part of the electrical work do not physically or functionally conflict with equipment or material installed as part of other work.

~~8 DECONSTRUCTION~~

~~.1 For each project which includes deconstruction, the Electrical Consultant must obtain guidance on the extent of the deconstruction from the VSB Project Manager early in the design phase.~~

9 EXISTING INFRASTRUCTURE

.1 Prior to the close of the tender period, the Electrical Contractor must visit the site and perform a detailed analysis of all existing infrastructure which relates to the Electrical Work.

.2 All work required to accommodate, remove, replace, relocate, and alter, existing infrastructure must be included in the tender price.

10 REQUIRED NOTIFICATIONS

.1 The Electrical Contractor must notify the VSB Electrical Supervisor (604-713-5649) of the scheduled date of each fire alarm verification. Each notification must occur no later than 3 weeks prior to the scheduled date of the associated verification.

.2 The Electrical Contractor must notify the VSB Electrical Supervisor (604-713-5649) of the date when intrusion system raceway and wiring will be complete. Notification must occur no later than 3 weeks prior to the date of completion.

.3 The Electrical Contractor must notify the VSB Electrical Supervisor (604-713-5649) of the date when the telecom cabling systems will be complete. Notification must occur no later than 3 weeks prior to the date of completion.

.4 The Electrical Contractor must notify the VSB Electrical Supervisor (604-713-5649) of the date when the audio system will be complete. Notification must occur no later than 3 weeks prior to the date of completion.

11 ELECTRICAL ROOMS

.1 A main electrical room must be provided in each new VSB facility.

.2 Service conductors must enter the main electrical room and terminate on a main circuit breaker in a main switchboard.

.3 Auxiliary electrical rooms must be provided as required.

.4 Spare space must be allocated in each electrical room for future equipment.

In each main electrical room, spare wall space 1.5m wide must be allocated. The wall space must be clear from the floor to the ceiling. There must be 2m of clear floor space in front of the 1.5m wide section of wall.

In each auxiliary electrical room, spare wall space 1.0m wide must be allocated. The wall space must be clear from the floor to the ceiling. There must be 1.5m of clear floor space in front of the 1.0m wide section of wall.

12 LOCATION OF MOTOR CONTROL EQUIPMENT

~~.1 ELEMENTARY SCHOOLS: Unless noted otherwise in this standard, all motor control equipment must be located in the Main Mechanical Room.~~

.2 SECONDARY SCHOOLS: Unless noted otherwise in this standard, all motor control equipment must be located in a mechanical room.

.3 Where six or more motor starters are to be located in a room, the motor starters must be mounted in a Motor Control Centre.

.4 Where there are no more than five motor starters in a mechanical room, the starters may be of the stand-alone type provided that they are grouped in an orderly fashion.

.5 No motor starter may be located such that the top of the starter is higher than 1830mm from the finished floor.

.6 A motor starter for a motor rated less than 1/6 horsepower may be located in the service room closest to the associated motor.

13 ELECTRICAL INFRASTRUCTURE IN EXIT STAIRS, CORRIDORS, AND VESTIBULES

.1 Electrical infrastructure may be installed within a given exit stair, corridor, or vestibule only if it serves that exit stair, corridor, or vestibule.

14 PENETRATION OF FIRE SEPARATIONS

.1 The Electrical Contractor must note the location of each rated and unrated fire separation shown on the Architectural Drawings. The Electrical Contractor must also note the rating for each rated fire separation.

.2 Unless noted otherwise in this standard, a wire or cable which penetrates a fire separation or a membrane forming part of a fire separation must be within a totally enclosed raceway.

.3 Raceway which penetrates a fire separation or a membrane forming part of fire separation must be:

(a) totally enclosed non-combustible raceway; or

(b) totally enclosed nonmetallic raceway which is rated FT4 and which is not more than 25mm in outside diameter (max trade size 21).

.4 Raceway which penetrates a fire separation or a membrane forming part of a fire separation must be cast-in-place or the penetration must be sealed with a ULC certified firestop system.

.5 Where a raceway which is not cast-in-place penetrates a rated fire separation or a membrane forming part of a rated fire separation, the firestop system must, when subjected to the fire test method in ULC-S115 "Fire Tests of Firestop Systems", have an FT rating not less than the fire-resistance rating of the fire separation.

.6 Where a raceway which is not cast-in-place penetrates a firewall, a firewall firestop system must be used.

.7 Where a raceway which is not cast-in-place penetrates an unrated fire separation or a membrane forming part of an unrated fire separation, the applied firestop system must have a minimum FT rating of one hour.

.8 Raceway sleeves must not penetrate a fire separation or a membrane forming part of a fire separation. Raceway which penetrates a fire separation or a membrane forming part of a fire separation must be continuous (to a pullbox which is not closer than 3 meters from the fire separation) on each side of the fire separation.

.9 Where cables carried on a cable tray are to cross a rated fire separation, Wiremold FlameStopper FS Series fittings must be used in accordance with the manufacturer's recommendations and requirements. Where the fire separation is rated, the FlameStopper system must have an FT rating not less than the fire-resistance rating of the fire separation. Where the fire separation is unrated, the FlameStopper system must have an FT rating not less than one hour.

.10 A non-combustible outlet box may penetrate a rated fire separation or a membrane forming part of a rated fire separation, if:

(a) the outlet box is cast-in-place, or

(b) the penetration is sealed with a firestop system which, when subjected to the fire test method in ULC-S115 "Fire Tests of Firestop Systems", has an FT rating not less than the fire-resistance rating of the fire separation.

.11 A non-metallic outlet box may penetrate a rated fire separation or a membrane forming part of a rated fire separation if the outlet box does not create an opening more than 0.016 square meters in area and:

(a) the outlet box is cast-in-place, or

(b) the penetration is sealed with a firestop system which, when subjected to the fire test method in ULC-S115 "Fire Tests of Firestop Systems", has an FT rating not less than the fire-resistance rating of the fire separation.

.12 Where an outlet box is to penetrate the outer membrane of a fire separation, another outlet box must not penetrate the outer membrane on the opposite side of the fire separation such that the boxes are immediately opposite each other. (The boxes must be separated laterally by at least 300mm.)

.13 Totally-enclosed non-metallic raceway may be embedded in a concrete floor slab provided there is a minimum of 50mm of concrete below the raceway.

.14 All firestopping work related to electrical infrastructure must be certified by a commissioning agent approved by the Prime Consultant. Certification reports must be completed and forwarded to the Electrical Consultant and the Prime Consultant.

15 PENETRATION OF ACOUSTICALLY RATED STRUCTURES

.1 Each penetration of an acoustically rated structure must be sealed such that the acoustic rating is preserved.

16 POWER SHUTDOWN

.1 Where the shutdown of power to any part of a facility (located outside of the construction area) is required to safely perform electrical work, the work must be performed on a weekend, statutory holiday, between 10 PM and 7AM, or as otherwise arranged with the VSB.

17 BRANCH CIRCUITS

.1 Each branch circuit which supplies one or more power outlets must supply power outlets only.

.2 Where more than one power outlet circuit serves a given space, each circuit must supply approximately the same number of power outlets.

.3 One power outlet circuit may supply a maximum of five power outlets.

.4 An office intended for the use of one or two people must be served by at least one power outlet circuit dedicated to that office only.

An office intended for the use of three to five people must be served by at least two power outlet circuits, each dedicated to that office only.

An office intended for the use of six to ten people must be served by at least three power outlet circuits, each dedicated to that office only.

.5 Each space which is not an office and which is 25 square meters in floor area or less may be served by one or more power outlet circuits which also serve other spaces.

.6 Each space which is not an office and which is more than 25 square meters in floor area but not more than 50 square meters in floor area must be served by at least one power outlet circuit dedicated to that space only.

.7 Each space which is not an office and which is more than 50 square meters in floor area but not more than 100 square meters in floor area must be served by at least two power outlet circuits, each dedicated to that space only.

.8 Each space which is not an office and which is more than 100 square meters in floor area must be served by at least three power outlet circuits, each dedicated to that space only.

.9 Each branch circuit which supplies one or more luminaires must supply luminaires only.

.10 Where more than one luminaire circuit serves a given space, each circuit must supply approximately the same number of luminaires.

Where luminaires are arranged in rows, circuit numbers should ascend consecutively through the rows.

(Example: Where there are three circuits and six rows, Row 1 should be supplied from Circuit 1, Row 2 from Circuit 2, Row 3 from Circuit 3, Row 4 from Circuit 1, Row 5 from Circuit 2, and Row 6 from Circuit 3.)

.11 Each space which is 25 square meters in floor area or less may be served by one or more luminaire circuits which also serve other spaces.

.12 Each space which is more than 25 square meters in floor area but not more than 50 square meters in floor area must be served by at least one luminaire circuit dedicated to that space only.

.13 Each space which is more than 50 square meters in floor area must be served by at least two luminaire circuits, each dedicated to that space only.

18 AUTOMATIC RECEPTACLE CONTROL

.1 ASHRAE 90.1 - ~~2010~~ 2016 is cited in the ~~2014~~ 2019 Vancouver Building By-law as a required standard.

8.4.2 of ASHRAE 90.1 - ~~2010~~ 2016 mandates automatic receptacle control (with specific exceptions) ~~for 50% of the receptacles in private offices, open offices, and computer classrooms~~.

~~City of Vancouver Bulletin 2015-001-BU states that projects submitted for building permit will be exempt from 8.4.2 of ASHRAE 90.1 - 2010.~~

8.4.2 of ASHRAE 90.1 - ~~2010~~ 2016 is not to be implemented on VSB projects~~.~~ as it is not a requirement of the 2019 Vancouver Building By-law.

19 BC HYDRO ENERGY EFFICIENCY INCENTIVE PROGRAMS

.1 During the schematic design phase for any project, the VSB Project Manager and the design team must determine whether the project is a suitable candidate for any BC Hydro energy efficiency incentive programs. All relevant BC Hydro programs must be considered.

.2 The decision to enter a project into a BC Hydro program will be made by the VSB Project Manager and the VSB Energy Manager.

.3 Where a project is entered into a BC Hydro program, the Electrical Consultant must follow the requirements of that program.

.4 For a given BC Hydro program, the Electrical Consultant must coordinate his activities with the Mechanical Consultant as required.

.5 For a given BC Hydro program, the VSB Energy Manager will be the main point of contact for the Design Team. All program deliverables must be submitted to the VSB Energy Manager who will then submit the deliverables to BC Hydro.

~~20 SPECIAL CASH ALLOWANCE~~

~~.1 A special cash allowance must be described in the Electrical Specifications.~~

~~Before the special cash allowance clause is finalized for inclusion in the Electrical Specifications, the amount of the cash allowance and the related scope of work must be confirmed with the VSB Project Manager.~~

~~The special cash allowance will typically cover the following work provided by the VSB and/or by contractors retained directly by the VSB:~~

~~(a) The performance of a wireless coverage study.~~

~~(b) The supply, installation, programming, and commissioning of data network components and wireless access points.~~

~~(c) The supply, installation, programming, and commissioning of classroom projectors and Apple TVs.~~

~~(d) The supply, installation, programming, and commissioning of Voip system components and Voip handsets.~~

~~(e) The supply, installation, programming, and commissioning of security system devices and equipment.~~

~~(f) Supervision of the fire alarm system commissioning.~~

~~(g) Supervision of the audio system commissioning.~~

~~The work covered by the special cash allowance DOES NOT overlap any of the work which must be described in the electrical contract documents.~~

~~Example 1: Although the cash allowance covers the supply, installation, programming, and commissioning of data network components and wireless access points, the electrical contract documents must describe, and the Electrical Contractor (or his subcontractor) must provide, cabling, terminations, outlets, patch panels, and racks as specified in this standard and in the VSB Structured Cabling Standard.~~

~~Example 2: Although the cash allowance covers the supply, installation, programming, and commissioning of security system devices and equipment, the electrical contract documents must describe, and the Electrical Contractor must provide, security system raceway, wiring, and enclosures as specified in this standard.~~

21 COMBINATION OUTLETS

.1 Refer to the subsection entitled "Combination Outlets" in Section 27 10 00 "Telecom Cabling".

~~22 MOSQUITOES~~

~~.1 During the design phase, the Electrical Consultant must request that the VSB Project Manager arrange a meeting between the Electrical Consultant, the VSB Electrical Supervisor, and the VSB Operations Supervisor for the purpose of establishing locations and electrical requirements associated with Mosquito anti-loitering devices.~~

~~.2 Each Mosquito location must be shown on the Electrical Drawings. Electrical infrastructure required for each Mosquito must be shown on the Electrical Drawings.~~

23 CONCRETE PADS FOR INDOOR EQUIPMENT

.1 A concrete mounting pad must be provided for each piece of electrical equipment which is designed to be floor mounted.

.2 The top surface of each pad must be level, smooth, and clean.

.3 The edges of each pad must be bevelled.

.4 Each pad must be finished with a concrete penetrating water sealer. The sealer must be applied after the concrete has cured.

.5 Each pad must be designed, inspected, and approved by a Professional Structural Engineer registered in BC.

The Structural Engineer must complete Vancouver Building By-law Schedules B, and C-B. The Structural Engineer must also complete AIBC/APEGBC Schedules S-B and S-C. A copy of each schedule must be forwarded to the Electrical Consultant. The original of each schedule must be forwarded to the Prime Consultant.

.6 Each pad must:

(a) extend 100mm above the finished floor;

(b) extend a minimum of 100mm beyond the base of the supported equipment on all sides;

(c) be steel-reinforced;

(d) rest on a steel-reinforced concrete footing or an appropriately designed floor structure.

.7 Each pad must be designed to:

(a) bear the weight of the supported equipment;

(b) accommodate the mounting infrastructure of the supported equipment.

.8 Each pad must incorporate sleeves or openings for ducts and cables where required.

.9 All connection hardware must be hot dip galvanized or stainless steel.

24 CONCRETE PADS FOR OUTDOOR EQUIPMENT

.1 A concrete mounting pad must be provided for each piece of exterior electrical equipment which is designed to be ground mounted.

.2 The top surface of each pad must be level, smooth, and clean.

.3 The edges of each pad must be bevelled.

.4 Each pad must be finished with a concrete penetrating water sealer. The sealer must be applied after the concrete has cured.

.5 Each pad must be designed, inspected, and approved by a Professional Structural Engineer registered in BC.

The Structural Engineer must complete Vancouver Building By-law Schedules B, and C-B. The Structural Engineer must also complete AIBC/APEGBC Schedules S-B and S-C. A copy of each schedule must be forwarded to the Electrical Consultant. The original of each schedule must be forwarded to the Prime Consultant.

.6 Each pad must:

(a) be 150mm above the finished grade;

(b) extend a minimum of 150mm beyond the base of the supported equipment on all sides;

(c) be steel-reinforced;

(d) rest on clean compacted structural fill;

(e) if subject to mechanical damage, be protected by appropriately placed stanchions.

.7 Where the equipment is fluid filled, the mounting pad must be surrounded by a drainage trench (lined with landscape fabric and filled with gravel) 450mm wide and 450mm deep;

.8 The grade surrounding each pad must swale away from the pad.

.9 Each pad must be designed to:

(a) bear the weight of the supported equipment;

(b) accommodate the mounting infrastructure of the supported equipment.

.10 Each pad must incorporate sleeves or openings for ducts and cables where required.

.11 Connection hardware must be hot dip galvanized or stainless steel.

25 ACCESS PANELS

.1 The Electrical Contractor must provide all rated and non-rated access panels required to access concealed electrical infrastructure.

.2 Acceptable Products - Access Panels

(a) Milcor

(b) Maxam

.3 Each access panel must be of the flush type with a steel frame and concealed hinges.

.4 Each access panel located in a masonry wall must be sized to suit the masonry modules.

.5 Each access panel located in a floor finished with tile, stonework, terrazzo, etc, must have an access door of the recessed bearing type. The floor material must be applied to the top surface of the access panel such that a smooth floor surface is maintained.

26 ELECTRICAL EQUIPMENT ENCLOSURES

.1 Unless noted otherwise in this standard, each electrical equipment enclosure in a damp or wet location (this includes all outdoor locations, whether covered or not) must be rated CSA Type 4X.

.2 Unless noted otherwise in this standard, each surface mounted or floor standing electrical equipment enclosure in an ordinary location must be designated by the manufacturer as "sprinklerproof".

27 PLYWOOD IN ELECTRICAL AND TELECOM ROOMS

.1 The following requirements apply to each electrical and telecom room.

.2 Unless noted otherwise in this standard, each wall must be covered with 19mm good-one-side (G1S) plywood.

.3 Plywood is not required on a wall area behind a piece of floor mounted equipment.

.4 Plywood must start at an elevation of 150mm AFF and extend upward for 2438mm (8FT) or to the ceiling if the ceiling is lower than 2588mm.

.5 Where a flush mounted outlet is present in a wall which is to be covered with plywood, a square opening must be cut in the plywood to expose the outlet. Each edge of each opening must be beveled. Each edge of each opening must be 25mm from the edge of the outlet coverplate.

.6 Two coats of paint must be applied to all plywood surfaces. The colour must be light gray (ANSI 70).

.7 Note that plywood installed in an electrical or telecom room is not intended to be part of a wall assembly and is not intended to affect the fire rating of the room. Even though the typical VSB facility is of non-combustible construction, plywood wall covering is NOT generally required to be fire rated. (The Electrical Consultant is invited to confirm this with the Code Consultant.)

28 GOOSENECK ROOF STACKS FOR FUTURE WIRING

.1 Where the project involves the installation of a new roof, two Thaler MEF-2A aluminum gooseneck roof stacks (to be designated as Roof Stack 1 and Roof Stack 2) must be installed in the new roof. The roof stacks must be supplied by the Electrical Contractor and installed by the Roofing Contractor.

.2 Roof Stack 1 is intended to serve cables associated with a future rooftop solar power system. Roof Stack 2 is intended to serve cables associated with a future telecom antenna system.

.3 On the underside of the roof deck, immediately below each roof stack, a 457mm W X 457mm L X 203MM D aluminum box (with screw-on cover facing down) must be provided.

.4 Inside each box, a stand-alone bonding busbar must be provided. (Refer to Section 26 05 26 "Grounding and Bonding" for busbar specifications.) Each busbar must be connected to the main grounding-bonding busbar in the Main Electrical Room by means of a 3/0 copper conductor.

.5 For each box:

(a) one #6 bare copper conductor must bond the box to the busbar;

(b) one #6 braided copper strap must bond the box cover to the box;

(c) one #6 bare copper conductor must bond the roof stack to the busbar.

.6 53mm raceway must run from the box under Roof Stack 1 to the Main Electrical Room.

.7 53mm raceway must run from the box under Roof Stack 2 to the Main Telecom Room.

29 WASHROOM AND SHOWER FIXTURE COMPONENTS WHICH REQUIRE POWER

.1 The Electrical Contractor must refer to the Mechanical Drawings and Mechanical Specifications for information regarding washroom and shower fixture components which require power.

.2 For each washroom or shower fixture component which requires power, the Electrical Contractor must provide power in strict conformance with the recommendations and requirements of the fixture component manufacturer.

30 DRINKING FOUNTAINS WHICH REQUIRE POWER

.1 A dedicated circuit must be provided for each drinking fountain which requires power. A GFCI circuit breaker must be provided for each dedicated circuit which serves a drinking fountain. (A regular receptacle must be provided at the drinking fountain instead of a GFCI receptacle.)

31 SEISMIC RESTRAINT

.1 The Electrical Contractor must retain a Seismic Engineer. The Seismic Engineer must be a Professional Engineer, registered in BC, with extensive experience in the field of seismic restraint.

.2 The Seismic Engineer must provide seismic restraint details for:

(a) each switchboard;

(b) each panelboard;

(c) each motor control centre;

(d) each splitter;

(e) each luminaire;

(f) each non-portable UPS unit;

(g) each disconnect switch rated at 100A or more;

(h) each raceway of 35mm or larger installed overhead;

(i) all cable tray;

(j) each box larger than 150mm X 150mm;

(k) each hand dryer;

(l) each emergency lighting battery pack;

(m) each telecom rack;

(n) each audio rack;

(o) each audio speaker;

(p) each video monitor;

(q) each security camera;

(r) each item of electrical infrastructure not listed here which could present a hazard if unrestrained during a seismic event.

Seismic details must include specifications for anchors, inserts, and fasteners. Seismic details must be provided to the Electrical Consultant prior to the installation of the above-listed equipment.

.3 Prior to the start of electrical work, the Seismic Engineer must complete Vancouver Building By-law Schedule B. The Seismic Engineer must also complete AIBC/APEGBC Schedule S-B. A copy of each schedule must be forwarded to the Electrical Consultant. The original of each schedule must be forwarded to the Prime Consultant.

.4 The Electrical Contractor must supply and install all seismic restraint systems specified by the Seismic Engineer.

.5 Following the installation of seismic restraint systems, the Seismic Engineer must inspect each seismic restraint system (or a typical example of each seismic restraint system).

.6 After the seismic restraint systems have been inspected by the Seismic Engineer and all deficiencies corrected, the Seismic Engineer must complete Vancouver Building By-law Schedule C-B. The Seismic Engineer must also complete AIBC/APEGBC Schedule S-C. A copy of each schedule must be forwarded to the Electrical Consultant. The original of each schedule must be forwarded to the Prime Consultant.

.7 If it is possible for a suspended luminaire to strike a fixed object when swinging along an arc which is up to 45 degrees from vertical (in any vertical plane), the luminaire must be seismically restrained with aircraft cable such that it will not swing along the arc.

32 PLYWOOD BACKING

.1 In the case where a door holder, hand dryer, speaker, monitor, projector, Smart Board, or other electrically-related device (weighing over 2 kilograms) is to be installed on a GWB wall, 19mm plywood backing must be provided within the wall to support the associated fasteners.

~~At each location where backing is required, a note to this effect must appear on the Electrical Drawings. Backing details must also be provided on the Architectural Drawings.~~

33 ELECTRICAL VEHICLE CHARGERS

.1 Level 2 electric vehicle charging stations must be provided as dictated by:

(a) City of Vancouver bylaws;

(b) development permit requirements;

(c) building permit requirements.

.2 Where no regulatory requirement is in place, the electrical design must include raceway and wiring to support a Level 2 charging station with [2] charging connectors.

The raceway must originate at a panelboard within the facility and terminate at a weatherproof inground box next to the designated electric vehicle parking location.

Prior to the design of the raceway and wiring, the Electrical Consultant must obtain specifications from the VSB for the charging station preferred by the VSB. The raceway and wiring must be suitable for the preferred charging station.

34 IDENTIFICATION

.1 Permanent handwritten labels are not permitted.

.2 Each permanent label must be of the lamacoid type or of the plastic tape type.

.3 Unless noted otherwise in this standard, each lamacoid nameplate or nametag must:

(a) be of acrylic;

(b) be 3mm thick;

(c) have a black face;

(d) have white, upper case, machine-engraved letters.

.4 Each lamacoid nameplate must be attached by means of high-strength acrylic adhesive.

.5 A lamacoid nameplate must be provided for each new switchboard, panelboard, motor control centre, and lighting control panel.

Each nameplate must display the identifier (shown on the single line diagram) which has been assigned to the associated equipment.

Each lamacoid nameplate must be 75mm Long X 25mm Wide. Lettering must be 6mm high.

.6 A lamacoid nameplate must be provided next to each circuit breaker located in an enclosure which does not have a directory-bearing front door. The label must identify the downstream equipment.

Each lamacoid nameplate must be 50mm Long X 25mm Wide. Lettering must be 6mm high.

.7 Before the full number of lamacoid nameplates are ordered, one test nameplate of each type must be submitted to the Electrical Consultant for review. The full number of nameplates may be ordered only when all deficiencies identified by the Electrical Consultant have been corrected.

.8 An engraved nametag with rounded corners must be securely attached to each grounding or bonding conductor which terminates at a stand-alone grounding-bonding or bonding busbar. The nametag must be securely attached to the conductor near the busbar termination. The nametag must identify the remote attachment point of the conductor.

Example 1: "GROUND ELECTRODE"

Example 2: "SWBD-114-61"

Example 3: "TX-114-21"

Example 4: "METAL WATER PIPE AT WATER ENTRY"

Example 5: "TELECOM CABLE TRAY"

Each engraved nametag must be 50mm Long X 25mm Wide. Lettering must be 4mm high.

.9 Before the full number of engraved nametags are ordered, one test nametag must be submitted to the Electrical Consultant for review. The full number of nametags may be ordered only when all deficiencies identified by the Electrical Consultant have been corrected.

.10 Plastic tape labels must be produced with a Brady HandiMark, Brother P-Touch, or a similar professional labelling machine. Each plastic tape label must be waterproof.

.11 A plastic tape label must be applied to the enclosure of each disconnect switch. The label must identify the downstream equipment.

Where the disconnect switch is fused and the fuses are rated less than the switch, a second plastic tape label must be added which reads "Fused at XXA" where "XX" is the rating of the fuses.

The tape must be white and 12mm wide. Lettering must be black, uppercase, and 6mm high. One label may include more than one strip of tape.

.12 A plastic tape label must be provided on or near each 5-15R and 5-20R receptacle. The label must identify the supply panelboard and circuit number.

Each strip of plastic labelling tape must be white and 6mm wide. Letters must be black, uppercase, and 3mm high. One label may include more than one strip of tape.

.13 A plastic tape label must be provided on or near each receptacle which is not of the 5-15R or 5-20R type. The label must identify:

(a) the supply panelboard and circuit number(s);

(b) the phase, number of circuit wires, nominal system voltage, current rating, and receptacle type.

Each strip of plastic labelling tape must be white and 6mm wide. Letters must be black, uppercase, and 3mm high. One label may include more than one strip of tape.

.14 A plastic tape label must be applied to the coverplate or enclosure of each control station which is not a lighting control station. The label must identify the function of the control station.

Each strip of plastic labelling tape (applied to a control station coverplate or enclosure) must be white and 6mm wide. Letters must be black, uppercase, and 3mm high. One label may include more than one strip of tape.

.15 A plastic tape label must be applied to the coverplate or enclosure of each lighting control station which controls luminaires which are not visible from the location of the control station. The label must identify the controlled luminaires.

Each strip of plastic labelling tape (applied to a control station coverplate or enclosure) must be white and 6mm wide. Letters must be black, uppercase, and 3mm high. One label may include more than one strip of tape.

.16 Each emergency lighting battery pack must bear a plastic tape label with an identifier of the form "BP-XXX" where "BP" stands for "Battery Pack" and "XXX" represents the battery pack number.

Each strip of plastic labelling tape applied to a battery pack must be white and 12mm wide. Lettering must be black, uppercase, and 6mm high.

.17 Each remote emergency luminaire must bear a plastic tape label which reads "SF BP-XXX" where "SF" stands for "Supplied From" and "BP-XXX" is the identifier of the battery pack which supplies the remote emergency luminaire.

Each strip of plastic labelling tape applied to a remote emergency luminaire must be white and 12mm wide. Lettering must be black, uppercase, and 6mm high.

.18 Each exit sign must bear a plastic tape label which reads "SF BP-XXX" where "SF" stands for "Supplied From" and "BP-XXX" is the identifier of the battery pack which supplies the exit sign. (Note that self-powered exit signs are not permitted except with special permission from the VSB Electrical Supervisor.)

Each strip of plastic labelling tape applied to an exit sign must be white and 12mm wide. Lettering must be black, uppercase, and 6mm high.

.19 Each combination emergency lighting unit (which includes a battery pack, emergency luminaires, and an exit sign) must bear a plastic tape label with an identifier of the form "CU-XXX" where "CU" stands for "Combination Unit" and "XXX" represents the combination unit number.

Each strip of plastic labelling tape applied to the combination unit must be white and 12mm wide. Lettering must be black, uppercase, and 6mm high.

.20 Note the following colour code:

GREEN	POWER
RED	FIRE ALARM
BLUE	INTRUSION
ORANGE	TELECOM
YELLOW	LIGHTING CONTROL
PURPLE	AUDIO

Each pull box cover and junction box cover must be finished with an electrostatically applied coating which conforms to the above colour code.

Where raceway is observable (not buried or embedded) it must be marked with water and oil resistant coloured plastic tape (19mm minimum width) which conforms to the above colour code. Three rings of tape (50mm centre to centre) must be applied to observable raceway at 2 meter intervals. (It is not necessary to mark raceway which is within 2 meters of a pull box or junction box.)

.21 Each panelboard must be supplied with a laser-printed directory. Each directory must be printed on 8.5" X 11" paper. The paper must be folded lengthwise and placed in an open-top transparent plastic sleeve mounted inside the door of the associated panelboard.

Prior to installation, panel directories must be emailed to the Electrical Consultant in PDF format. Panel directories must not be installed until all changes required by the Electrical Consultant have been made.

.22 Each lighting control panel must be supplied with a laser-printed directory. Each directory must be printed on 8.5" X 11" paper. The paper must be folded lengthwise and placed in an open-top transparent plastic sleeve mounted inside the door of the associated lighting control panel.

.23 For each fire alarm cable, audio cable, intrusion cable, and telecom cable, a plastic tape label bearing the cable identifier must be affixed to the cable at each end.

.24 A plastic tape label must be affixed to each fire alarm system device. The label must bear the device identifier.

35 ASBESTOS

.1 No asbestos containing material or equipment may be used under any circumstances.

36 CLEANING

.1 All debris created by the electrical work must be removed at the end of each work day.

.2 At substantial completion, all equipment, material, and spaces associated with the electrical work must be thoroughly cleaned.

~~37 RECYCLING AND DISPOSAL~~

~~.1 In each construction area, all existing fluorescent and HID luminaires (which are not to be re-used) must be removed.~~

~~Fluorescent and HID lamps must be separated from each removed fixture. Lamps must be transported to a licensed lamp recycling facility.~~

~~Fluorescent and HID ballasts must be separated from each removed fixture. Ballasts must be transported to a licensed ballast recycling facility.~~

~~.2 In each construction area, all nonhazardous recyclable material associated with the electrical work must be removed and segregated by material type. (Examples: Metal / Glass / Styrofoam / Paper / Plastic) Material of each type must be transported to a licensed recycling facility.~~

~~.3 Any hazardous recyclable material must be handed off to the appropriate recycling authority. This material must be collected, stored, handled, and transported in strict accordance with WorkSafe BC requirements.~~

~~.4 In each construction area, all nonhazardous unrecyclable refuse associated with the electrical work must be removed and transported to a licensed disposal facility.~~

~~.5 Any hazardous unrecyclable material must be handed off to the appropriate disposal authority. This material must be collected, stored, handled, and transported in strict accordance with WorkSafe BC requirements.~~

~~38 OVERALL WARRANTY~~

~~.1 The Electrical Contractor must provide a complete and comprehensive warranty which covers ***the Electrical Work*** for a period of one year following notice of substantial completion.~~

~~During the one-year warranty period, any problems discovered with ***the Electrical Work*** must be fully rectified at no cost to the Owner.~~

~~Problems include:~~

~~(a) poor or marginal workmanship;~~

~~(b) poor or marginal equipment condition;~~

~~(c) poor or marginal equipment or system performance;~~

~~(d) lack of conformance with applicable codes and standards.~~

39 ELECTRICAL OPERATION AND MAINTENANCE MANUAL

.1 An Electrical Operation & Maintenance Manual must be produced.

.2 The manual must include a title page. The title page must display the following information:

[SCHOOL NAME]
[SCHOOL ADDRESS]
ELECTRICAL OPERATION & MAINTENANCE MANUAL
[ELECTRICAL CONTRACTOR NAME]
[DATE]

.3 The manual must include a table of contents. The table of contents must be organized as follows:

SECTION 1 GENERAL

1.1 CONTACT LIST OF PROJECT PARTICIPANTS

1.2 CONTACT LIST OF CONTRACTORS AND SUPPLIERS

1.3 SAFETY INFORMATION

1.4 ELECTRICAL PERMIT

1.5 INSPECTION TICKET - FINAL ELECTRICAL

1.6 BUILDING CODE SCHEDULES - SEISMIC

1.7 BUILDING CODE SCHEDULES - ELECTRICAL

1.8 WARRANTIES

SECTION 2 ELECTRIC POWER SYSTEMS

2.1 SHOP DRAWINGS - POWER EQUIPMENT

2.2 PANELBOARD SCHEDULES

2.3 COMMISSIONING REPORTS

SECTION 3 ELECTRIC LIGHTING SYSTEMS

3.1 SHOP DRAWINGS - LUMINAIRES

3.2 SHOP DRAWINGS - LAMPS

3.3 SHOP DRAWINGS - LIGHTING CONTROL SYSTEM

3.4 SHOP DRAWINGS - EMERGENCY LIGHTING EQUIPMENT

3.5 EMERGENCY LIGHTING TEST LETTER

SECTION 4 FIRE ALARM SYSTEM

4.1 SHOP DRAWINGS - FIRE ALARM SYSTEM

4.2 FIRE ALARM SYSTEM VERIFICATION REPORT

4.3 FIRE ALARM SYSTEM VERIFICATION CERTIFICATE

4.4 ULC MONITORING CERTIFICATE

SECTION 5 TELECOM CABLING SYSTEMS

5.1 SHOP DRAWINGS - RACKS & ACCESSORIES

5.2 SHOP DRAWINGS - UPS UNITS & ACCESSORIES

5.3 SHOP DRAWINGS - FIBER BACKBONE CABLE, TERMINATIONS, & PANELS

5.4 SHOP DRAWINGS - COPPER BACKBONE CABLE & TERMINATIONS

5.5 SHOP DRAWINGS - COPPER HORIZONTAL CABLE, TERMINATIONS, & PATCH PANELS

5.6 HORIZONTAL CABLE IDENTIFICATION TABLE

5.7 BACKBONE CABLE IDENTIFICATION TABLE

5.8 SUMMARY OF TEST RESULTS

SECTION 6 AUDIO SYSTEM

6.1 INSTRUCTIONS FOR MAKING ANNOUNCEMENTS

6.2 INSTRUCTIONS FOR DISTRIBUTING MUSIC

6.3 INSTRUCTIONS FOR CREATING, CONTROLLING, AND MODIFYING THE CLASS-CHANGE TONE SCHEDULE

6.4 INSTRUCTIONS FOR USING THE TYPE 1 AND TYPE 2 AUDIO INPUT STATIONS

6.5 AUDIO SYSTEM SHOP DRAWINGS

6.6 AUDIO SYSTEM COMMISSIONING REPORT

.4 For each section, a section title page must be provided.

.5 For each subsection, a subsection title page must be provided.

.6 The manual must take the form of a single PDF document. The PDF document must include bookmarks for each section and subsection.

.7 A preliminary copy of the manual must be submitted to the Electrical Consultant in PDF format. If the Electrical Consultant determines that the manual contains deficiencies, the deficiencies must be corrected and the manual must be resubmitted (in PDF format) to the Electrical Consultant.

When the manual is deemed acceptable by the Electrical Consultant, three hardcopies must be produced.

Each hardcopy manual must be assembled in a 3-post expandable type binder. The binder must be Model VBB-3-5 produced by Vancouver Book Binding. The binder must be black. The binder must have 25% spare space for future additional content.

The following information must be imprinted in gold foil on the front cover and spine of each binder:

[SCHOOL NAME]
[SCHOOL ADDRESS]
ELECTRICAL OPERATION & MAINTENANCE MANUAL

Each binder must include a disc holder with a CD-DVD. Each CD-DVD must contain the PDF copy of the manual. Each CD-DVD must be labelled as follows:

[SCHOOL NAME]
[SCHOOL ADDRESS]
ELECTRICAL OPERATION & MAINTENANCE MANUAL

.8 The Contractor must provide the hardcopy manuals to the Prime Consultant. The Prime Consultant must forward the manuals to the VSB within 60 days of substantial completion.

40 DEMONSTRATION AND TRAINING REQUIREMENTS

.1 [1] 2-hour orientation session for the power distribution system must be provided to designated representatives of VSB Operations and VSB Maintenance. The session must be led by the Electrical Foreman.

.2 [1] 1-hour orientation session for the fire alarm system must be provided to designated representatives of VSB Operations and VSB Maintenance. The session must be led by the Electrical Foreman.

.3 [1] 4-hour session focused on the operation and maintenance of the lighting control system must be provided to designated representatives of VSB Operations and VSB Maintenance. The session must be led by the ESC Automation Project Manager.

.4 [1] 4-hour session focused on the operation and maintenance of the audio system must be provided to designated representatives of VSB Operations and VSB Maintenance. The session must be led by the Audio System Project Manager.

.5 [2] 2-hour sessions (each session with identical content) focused on the operation of the audio system must be provided to school staff members. (Some staff member may wish to attend both sessions. Other staff members will have the option of picking the first or second session.) Each session must be led by the Audio System Project Manager.

.6 [1] 2-hour orientation session for the telecom cabling system must be provided to designated representatives of the VSB Learning and Information Technology Division. The session must be led by the Telecom Cabling Project Manager.

41 ~~ELECTRICAL DRAWINGS~~

~~.1 The Electrical Consultant must produce a set of electrical drawings.~~

~~The Electrical Drawings must be divided into the following sections as applicable.~~

~~(a) General Information~~

~~(b) Deconstruction & Restoration~~

~~(c) Electrical Site Services~~

~~(d) Power / Fire Alarm / Miscellaneous~~

~~(e) Lighting~~

~~(f) Telecom Cabling~~

~~(g) Audio Video Systems~~

~~(h) Security Systems~~

~~The following editions must be produced:~~

~~(a) 50% complete for VSB Review~~

~~(b) 100% complete for VSB Review~~

~~(c) For Permit~~

~~(d) For Tender~~

~~(e) For Construction~~

~~(f) Record~~

42 ELECTRICAL DRAWING REVISIONS

.1 The master electronic drawing files maintained by the Electrical Consultant must be kept up to date as the project proceeds.

~~43 RECORD DRAWINGS~~

~~.1 The Electrical Consultant must produce "Record" drawings at the end of the project. The cost of producing these drawings must be included in the Electrical~~

~~Consultant's fee. (It is NOT acceptable for the Electrical Contractor to produce these drawings.)~~

~~The Electrical Consultant must provide the Prime Consultant with [2] hardcopy sets as well as a CD-DVD containing electronic drawing files in both DWG and PDF format. (The Prime Consultant must forward this material to the VSB within 60 days of substantial completion.)~~

SECTION 26 05 19
LOW-VOLTAGE CONDUCTORS AND CABLES

1 GENERAL

.1 Standards

(a) CSA-C22.2 No. 38 "Thermoset-Insulated Wires and Cables"

(b) CSA-C22.2 No. 49 "Flexible Cords and Cables"

(c) CSA-C22.2 No. 51 "Armoured Cables"

(d) CAN/CSA-C22.2 No. 131 "Type TECK 90 Cable"

.2 Acceptable Manufacturers - Low-Voltage Conductors and Cables

(a) Allied Wire & Cable

(b) General Cable

(c) Nexans Canada

(d) Pirelli Cables & Systems

.3 All low-voltage conductors must be of copper.

.4 All low-voltage conductors must be #12 AWG or larger.

.5 All conductors of #12 AWG and #10 AWG must be solid. All conductors larger than #10 AWG must be stranded.

.6 Unless noted otherwise in this standard, each low-voltage conductor must be Type RW90 and have cross-linked polyethylene (XLPE) insulation rated for 600 volts.

.7 Unless noted otherwise in this standard, all low-voltage conductors must be installed in raceway. Refer to Section 26 05 33 (Raceway and Boxes) for raceway requirements.

.8 Conductors must be colour coded as described in the BC Electrical Code.

Conductors of #6 AWG and smaller must have coloured insulation which conforms to the coding.

Water and oil resistant coloured plastic adhesive tape, 19mm minimum width, must be used for colour coding conductors which are #4 AWG and larger.

Where coloured tape is used for color coding, conductor insulation must be black.

.9 AC90 cable may be installed in an ordinary location between a junction box and a luminaire if:

(a) the junction box is mounted on a structural ceiling (or on supports attached to a structural ceiling) in a ceiling space formed by the installation of a suspended tbar ceiling, and

(b) the luminaire is mounted in the tbar ceiling and it is within 3 meters of the junction box.

.10 AC90 cable may be installed in an ordinary location between a junction box in a wall space and an outlet or device box within the same wall space.

.11 AC90 cable must not be installed between a ceiling space and a wall space.

.12 AC90 cable must not be daisy chained between luminaires or receptacles.

.13 Unless noted otherwise in this standard, where AC90 cable is permitted, it must be concealed.

.14 Each conductor placed in a damp or wet location must be approved for wet locations.

Each underground location within a building footprint must be considered as a wet location.

Each location within concrete or masonry, where the concrete or masonry is at or below grade must be considered as a wet location.

SECTION 26 05 26
GROUNDING AND BONDING

1 GENERAL

.1 Standards

(a) CSA-C22.2 No. 41 "Grounding and Bonding Equipment"

(b) CSA-C22.2 No. 0.4 "Bonding of Electrical Equipment"

.2 Acceptable Manufacturers - Grounding and Bonding Products

(a) Blackburn

(b) Burndy

(c) Cadweld

(d) Erico

(e) Panduit

(f) Code Electric

.3 For each new facility, a UFER (concrete-encased) ground electrode must be provided at or near the service entrance.

.4 Each stand-alone grounding-bonding or bonding busbar must:

(a) be of electrotin-plated solid copper;

(b) have pre-drilled holes to accommodate lugs of various standard sizes.

Each stand-alone grounding-bonding or bonding busbar must:

(a) be 6mm thick, 300mm long, and 100mm wide if located in an electrical or telecom room;

(b) be 6mm thick, 150mm long, and 50mm wide if located in a box under a gooseneck roof stack.

Each stand-alone grounding-bonding or bonding busbar must be part of an assembly which includes:

(a) [2] mounting brackets;

(b) [2] insulators;

(c) fastener hardware.

Each mounting bracket must be of stainless steel and must be solidly connected to the mounting surface.

An insulator must be installed between each mounting bracket and the busbar. The insulator must electrically insulate the bracket from the busbar.

All fastener hardware must be of stainless steel.

Each busbar assembly must be listed by a nationally recognized testing laboratory.

2 STAND-ALONE GROUNDING-BONDING BUSBAR / EACH ELECTRICAL ROOM

.1 A stand-alone grounding-bonding busbar must be provided in the Main Electrical Room. This busbar must be labelled "MAIN GROUNDING-BONDING BUSBAR"

.2 LIST OF CONNECTIONS FOR MAIN GROUNDING-BONDING BUSBAR

CONNECTION 1 - #3/0 copper grounding conductor. This conductor must originate at the concrete-encased (UFER) ground electrode.

CONNECTION 2 - #3/0 copper grounding conductor. This conductor must originate at the concrete-encased (UFER) ground electrode.

CONNECTION 3 - #3/0 copper grounding-bonding conductor. This conductor must originate at the grounding-bonding busbar within the Main Service Switchboard.

CONNECTION 4A - Copper grounding conductor. This conductor must originate at the secondary of a transformer in the Main Electrical Room where such a transformer exists and where a grounding connection is required on the secondary side. The conductor must be sized according to Code.

CONNECTIONS 4B 4C etc - Each connection is similar to Connection 4A. One connection is required for each additional transformer which exists in the Main Electrical Room and which requires a grounding connection on the secondary side.

CONNECTION 5 - #6 copper bonding conductor. This conductor must originate at a metal water pipe (inside the building) near the water service entrance.

CONNECTION 6 - #6 copper bonding conductor. This conductor must originate at a metal gas pipe (inside the building) near the gas service entrance.

CONNECTION 7 - #6 copper bonding conductor. This conductor must originate at a metal sprinkler pipe (inside the building) near the sprinkler tree.

CONNECTION 8A - #3/0 copper grounding-bonding conductor. This conductor must originate at the grounding-bonding busbar in an auxiliary electrical room where such a room exists.

CONNECTIONS 8B 8C etc - Each connection is similar to Connection 8A. One connection is required for each additional auxiliary electrical room which exists.

ADDITIONAL CONNECTIONS - As required.

.3 A stand-alone grounding-bonding busbar must be provided in each auxiliary electrical room. Each stand-alone grounding-bonding busbar in an auxiliary electrical room must be labelled "GROUNDING-BONDING BUSBAR".

.4 LIST OF CONNECTIONS FOR EACH GROUNDING-BONDING BUSBAR IN AN AUXILIARY ELECTRICAL ROOM

CONNECTION 1 - #3/0 copper grounding-bonding conductor. This conductor must originate at the Main Grounding-Bonding Busbar in the Main Electrical Room.

CONNECTION 2A - Copper grounding conductor. This conductor must originate at the secondary of a transformer in the auxiliary electrical room where such a transformer exists and where the secondary requires a grounding connection. The conductor must be sized according to Code.

CONNECTIONS 2B 2C etc - Each connection is similar to Connection 2A. One connection is required for each additional transformer which exists in the auxiliary electrical room and which requires a grounding connection on the secondary side.

ADDITIONAL CONNECTIONS - As required.

.5 Acceptable Product - Stand-Alone Grounding-Bonding Busbar Located in an Electrical Room

(a) Erico EGB-A-14-4-12-RR

(b) approved equivalent

3 STAND-ALONE BONDING BUSBAR / EACH TELECOM ROOM

.1 A stand-alone bonding busbar must be provided in the Main Telecom Room. This busbar must be labelled "MAIN TELECOM BONDING BUSBAR".

.2 LIST OF CONNECTIONS FOR MAIN TELECOM BONDING BUSBAR

CONNECTION 1 - #3/0 copper bonding conductor. This conductor must originate at the Main Grounding-Bonding Busbar in the Main Electrical Room.

CONNECTION 2 - #12 copper bonding conductor. This conductor must originate at an otherwise unbonded metal box or raceway in the Main Telecom Room (where such a box or raceway exists). Unless noted otherwise in this standard, the conductor must daisy chain to all other otherwise unbonded metal boxes and raceways in the Main Telecom Room (where these additional boxes and/or raceways exist) before terminating at the Telecom Bonding Busbar.

Where it is more efficient, multiple #12 copper bonding conductors may used. Each conductor must originate on an otherwise unbonded metal box or raceway and daisy chain to a subset of otherwise unbonded metal boxes and/or raceways before terminating at the Main Telecom Bonding Busbar.

CONNECTION 3 - #6 copper bonding conductor. This conductor must originate at a telecom rack. All telecom racks must be bonded together with one or more #6 copper bonding conductors.

CONNECTION 4 - #3/0 copper bonding conductor. This conductor must originate at any cable tray which exists within the Main Telecom Room.

CONNECTION 5 - #6 copper bonding conductor. This conductor must originate at the Telus copper service entrance protector.

CONNECTION 6 - #6 copper bonding conductor. This conductor must originate at the Telus fiber service entrance protector where such a protector exists.

CONNECTION 7 - #6 copper bonding conductor. This conductor must originate at the main intrusion system pullbox.

CONNECTION 8A - #3/0 copper bonding conductor. This conductor must originate at the bonding busbar in an auxiliary telecom room where such a room exists.

CONNECTIONS 8B 8C etc - Each connection is similar to Connection 8A. One connection is required for each additional auxiliary telecom room which exists.

ADDITIONAL CONNECTIONS - As required.

.3 A stand-alone bonding busbar must be provided in each auxiliary telecom room. Each stand-alone bonding busbar in an auxiliary telecom room must be labelled "TELECOM BONDING BUSBAR".

.4 LIST OF CONNECTIONS FOR EACH TELECOM BONDING BUSBAR IN AN AUXILIARY TELECOM ROOM

CONNECTION 1 - #3/0 copper bonding conductor. This conductor must originate at the Main Telecom Bonding Busbar in the Main Telecom Room.

CONNECTION 2 - #12 copper bonding conductor. This conductor must originate at an otherwise unbonded metal box or raceway in the auxiliary telecom room (where such a box or raceway exists). Unless noted otherwise in this standard, the conductor must daisy chain to all other otherwise unbonded metal boxes and raceways in the auxiliary telecom room (where these additional boxes and/or raceways exist) before terminating at the Telecom Bonding Busbar.

Where it is more efficient, multiple #12 copper bonding conductors may used. Each conductor must originate on an otherwise unbonded metal box or raceway and daisy chain to a subset of otherwise unbonded metal boxes and/or raceways before terminating at the Telecom Bonding Busbar.

CONNECTION 3 - #6 copper bonding conductor. This conductor must originate at a telecom rack. All telecom racks must be bonded together with one or more #6 copper bonding conductors.

CONNECTION 4 - #3/0 copper bonding conductor. This conductor must originate at any cable tray which exists within the auxiliary telecom room.

ADDITIONAL CONNECTIONS - As required.

.5 Acceptable Product - Stand-Alone Bonding Busbar Located in a Telecom Room

(a) Erico EGB-A-14-4-12-RR

(b) Approved equivalent

4 STAND-ALONE BONDING BUSBAR / EACH BOX UNDER A GOOSENECK ROOF STACK

.1 A stand-alone bonding busbar must be provided in each box which is immediately below a gooseneck roof stack designated for the use of telecom or photovoltaic cables. Each busbar in this location must be labelled "ROOF STACK BONDING BUSBAR".

.2 Acceptable Product - Bonding Busbar Located in a Box Under a Gooseneck Roof Stack

(a) Erico EGB-A-14-2-6-RR

(b) Approved equivalent

.3 LIST OF CONNECTIONS FOR EACH BONDING BUSBAR IN A BOX UNDER A GOOSENECK ROOFSTACK

CONNECTION 1 - #3/0 copper grounding-bonding conductor. This conductor must originate at the Main Grounding-Bonding Busbar in the Main Electrical Room.

CONNECTION 2 - #6 bare copper bonding conductor. This conductor must originate at the box.

CONNECTION 3 - #6 bare copper bonding conductor. This conductor must originate at the base of the roof stack.

CONNECTION 4 - #6 bare copper bonding conductor. This conductor must originate at the cable entrance protector in the box.

CONNECTION 5 - #6 bare copper bonding conductor. This conductor must originate at the metallic support structure for a rooftop antenna or for a photovoltaic array.

NOTE: The box must be bonded to the cover by means of a braided copper strap equivalent to a #6 copper conductor.

ADDITIONAL CONNECTIONS - As required.

5 GROUNDING-BONDING CONNECTIONS

.1 Each connection must be securely made by means of a connector or process approved for the application.

.2 Each connection which is to be underground or embedded in concrete must be securely made by means of a Cadweld connection or by means of an irreversible high compression connection.

.3 Each conductor-to-busbar connection must be securely made by means of a 2-hole, solid copper, tin-plated compression lug.

.4 Each conductor-to-EMT connection must be securely made by means of a bonding bushing.

6 INSULATION AND RACEWAY

.1 Where a stand-alone copper grounding, bonding, or grounding-bonding conductor originates and terminates within a single space, the conductor must be bare.

.2 Where a stand-alone copper grounding, bonding, or grounding-bonding conductor does not originate and terminate within a single space, the conductor must be RW90 (with green insulation) and must run in 21mm raceway.

7 STEEL RACEWAY

.1 Where a stand-alone grounding, bonding, or grounding-bonding conductor is to be installed in one or more continuous sections of steel raceway, the conductor must be bonded to the raceway at each end of each continuous section.

8 BONDING OF TELECOM CABLE TRAY

.1 For each continuous section of telecom cable tray, a ~~#3/0~~ #6 AWG copper bonding conductor must run along the length of the section. The conductor must be bonded to the tray with an approved bonding connector at [2] meter intervals.

.2 Each telecom cable tray bonding conductor must be connected to at least [1] grounding-bonding or bonding busbar by means of a ~~#3/0~~ #6 AWG copper bonding conductor.

SECTION 26 05 29
FASTENERS, SUPPORTS, AND RELATED PRODUCTS

1 GENERAL

.1 Standards

(a) CAN/CSA-C22.2 No. 18.3 "Conduit, Tubing and Cable Fittings"

(b) CAN/CSA-C22.2 No. 18.4 "Hardware for the Support of Conduit, Tubing and Cable"

(c) CSA-C22.2 No. 62.1 "Non-metallic Surface Raceways and Fittings"

(d) CAN/CSA-C22.2 No. 85 "RPVC Boxes and Fittings"

.2 High-strength fasteners must be hot dip galvanized.

.3 Non-high-strength fasteners must be of:

(a) galvanized steel in dry locations;

(b) stainless steel in damp or wet locations.

.4 Fasteners installed by means of powder-actuated tools are not permitted.

.5 Fasteners which could cause spalling or cracking in the base material must not be used.

SECTION 26 05 30
SPLITTERS

1 GENERAL

.1 Standard

CAN/CSA-C22.2 No. 76 "Splitters"

.2 Each splitter must include a full capacity copper bus bar for each phase and neutral. Each bus bar must extend the full length of the splitter enclosure.

.3 Each splitter must be equipped with two spare sets of lugs.

.4 Each splitter enclosure in an ordinary location must be designated by the manufacturer as "sprinklerproof".

SECTION 26 05 33
RACEWAY AND BOXES

1 GENERAL

.1 Standards

(a) CAN/CSA-C22.2 No. 18.1 "Metallic Outlet Boxes"

(b) CAN/CSA-C22.2 No. 18.2 "Non-metallic Outlet Boxes"

(c) CSA-C22.2 No. 40 "Cutout, Junction and Pull Boxes"

(d) CSA-C22.2 No. 45 "Rigid Metal Conduit"

(e) CSA-C22.2 No. 45.1 "Rigid Metal Conduit - Steel"

(f) CSA-C22.2 No. 56 "Flexible Metal Conduit and Liquid-Tight Flexible Metal Conduit"

(g) CSA-C22.2 No. 62 "Surface Raceway Systems"

(h) CSA-C22.2 No. 62.1 "Non-metallic Surface Raceways and Fittings"

(i) CAN/CSA-C22.2 No. 83 "Electrical Metallic Tubing"

(j) CAN/CSA-C22.2 No. 83.1 "Electrical Metallic Tubing - Steel"

(k) CAN/CSA-C22.2 No. 85 "RPVC Boxes and Fittings"

(l) CSA-C22.2 No. 211.1 "Rigid Types EB1 and DB2/ES2 PVC Conduit"

(m) CSA-C22.2 No. 211.2 "RPVC (Unplasticized) Conduit"

(n) CAN/CSA-C22.3 No. 7 "Underground Systems"

.2 Acceptable Manufacturers - Rigid Metal Conduit and Associated Fittings

(a) Allied Tube & Conduit

(b) Columbia-MBF

.3 Acceptable Manufacturers - EMT and Associated Fittings

(a) Allied Tube & Conduit

(b) Columbia-MBF

.4 Acceptable Manufacturers - RPVC Conduit and Associated Fittings

(a) IPEX

(b) Royal Pipe Systems

.5 Acceptable Manufacturer - Surface Raceway Systems

(a) Wiremold

.6 Acceptable Product - Liquid-Tight Flexible Metal Conduit and Associated Fittings

(a) SealTite by Anamet Canada

.7 Acceptable Manufacturers - Steel and Aluminum Cut-out Boxes, Junction Boxes, Pull Boxes, Outlet Boxes, Associated Covers, and Associated Fittings

(a) Code Manufacturing

(b) Iberville

(c) Hammond

(d) Red Dot

(e) Steel City

(f) Vancouver Electric Boxes

(g) Appleton Electric

.8 Acceptable Manufacturers - RPVC Cut-out Boxes, Junction Boxes, Pull Boxes, Outlet Boxes, Associated Covers, and Associated Fittings

(a) IPEX

(b) Royal Pipe Systems

.9 Acceptable Product - Exterior Pre-cast In-ground Pull Boxes

(a) Armtec

.10 Unless noted otherwise in this standard, all conductors must be installed in raceway.

.11 All raceway in a damp or wet location must be approved for use in wet locations.

.12 Each underground location within a building footprint must be considered as a wet location.

.13 Each location within concrete or masonry, where the concrete is at or below grade must be considered as a wet location.

.14 Unless noted otherwise in this standard, all conductors to be installed in an ordinary location must be installed in EMT.

.15 Wet location couplings and connectors must be provided for exposed EMT raceway within an ordinary location. (This is to prevent sprinkler water from

entering the raceway. This requirement holds for both sprinklered and unsprinklered locations as any unsprinklered location could be sprinklered in the future.)

.16 All conductors to be installed underground or within concrete or masonry must be installed in RPVC conduit.

.17 All conductors to be installed in a damp or wet location (which is not underground or within concrete or masonry) must be installed in EMT with wet location couplings and connectors.

.18 All conductors in a hazardous location must be installed in rigid metal conduit.

.19 In a location where conductors would be subject to mechanical damage without significant protection, the conductors must be installed in rigid metal conduit.

.20 Unless noted otherwise in this standard, where conductors terminate at:

(a) a transformer rated 15 KVA or higher, or

(b) a piece of equipment which contains or is linked to moving parts, or

(c) a piece of equipment which is subject to vibration, or

(d) a piece of equipment which can leak oil or other fluid,

the conductors (from the transformer or equipment enclosure to a point not farther than 1.5 meters upstream) must be installed in liquid-tight flexible metallic raceway.

.21 Unless noted otherwise in this standard, raceway must be concealed.

.22 Raceway may be exposed in a service space or on an open ceiling.

.23 Where all or part of a raceway run is embedded or buried, the raceway run must be mandrelled and swabbed before use.

.24 A polypropylene pull cord must be provided between pull points in each run of raceway which is installed for future use or for the use of others.

.25 For each run of raceway installed for future use or for the use of others, a factory cap must be provided on each free end.

.26 Each totally-enclosed non-metallic raceway must have an FT4 rating and must have an outside diameter less than 175mm.

.27 All horizontal raceway within the building footprint must run parallel to building gridlines.

.28 Raceway installed in a space which contains thermal insulation must be separated from the insulation by a minimum of 300mm.

.29 Where raceway is to penetrate an existing concrete or masonry element, the element must be x-rayed and, if hidden services are present at or near the

proposed location of the penetration, the penetration must be appropriately relocated.

.30 Two boxes which are to be installed at the same elevation must not be installed back-to-back in any wall. At least 300mm of horizontal separation must be provided.

.31 Where a raceway is to cross a seismic expansion joint, the raceway must transition to liquid tight flexible conduit prior to the joint, and transition back after the joint. There must be a minimum of 300mm of liquid tight flexible conduit on each side of the joint.

.32 Each metallic outlet box must be galvanized and of the one-piece formed type. Sectional boxes are not permitted.

.33 A vapour barrier boot must be provided for each box in a wall or ceiling where the box would otherwise break the vapour barrier.

.34 Where a wet location connector is to be installed through a drip hood and into an enclosure, a bullet hub must be used to ensure a sealed connection. Silicone is not to be used.

.35 Only liquid tight fittings may be used for liquid tight flexible metallic conduit.

.36 Electrical non-metallic tubing (ENT) is not permitted.

.37 Each pull box in a raceway system designated for extra-low-voltage conductors and cables must be configured to permit straight pulls only. (Note that extra-low-voltage cables include fire alarm cables, telecom cables, intrusion cables, and audio cables.)

.38 Each raceway system designated for extra-low-voltage conductors and cables must be constructed such that there is no more 180 degrees of bending between any two consecutive pull-points. (Note that extra-low-voltage cables include fire alarm cables, telecom cables, intrusion cables, and audio cables.)

.39 Each raceway system designated for extra-low-voltage conductors and cables must be constructed such that there is no more than 30 meters of pulling distance between any two consecutive pull points. (Note that extra-low-voltage cables include fire alarm cables, telecom cables, intrusion cables, and audio cables.)

.40 For each exterior inground precast concrete pull box, a 150mm deep layer of 40mm minus clear compacted drain gravel must be provided below the box. A pit filled with 40mm minus clear compacted drain gravel must be provided below the drain hole of each box. The pit must be 300mm deep X 300mm wide X 300mm long. The pit must be centred on the drain hole.

SECTION 26 05 83
WIRING CONNECTIONS

1 GENERAL

.1 Standards

(a) CSA-C22.2 No. 65 "Wire Connectors"

(b) CSA-C22.2 No. 153 "Quick-Connect Terminals"

(c) CSA-C22.2 No. 158 "Terminal Blocks"

(d) CSA-C22.2 No. 188 "Splicing Wire Connectors"

(e) CSA-C22.2 No. 198.2 "Sealed Wire Connector Systems"

.2 Acceptable Manufacturers - Connectors and Terminals

(a) Panduit

(b) Marrette

(c) Sta-Kon

(d) Allen-Bradley

(e) Wiedmuller

(f) FCI / Burndy

(g) Ideal

(h) 3M

.3 Acceptable Manufacturers - Terminal Blocks

(a) ABB Entrelec

SECTION 26 09 13
ELECTRICAL POWER MONITORING

1 GENERAL

.1 Unless noted otherwise in this standard, the following electrical loads must be monitored:

(a) the total load;

(b) the total mechanical load;

(c) the load which is comprised of the total lighting load, the total miscellaneous load, and the total plug load;

(d) each substantial mechanical or heating load.

.2 Acceptable Manufacturers - Energy Meters

(a) Eaton

(b) Schneider

(c) Siemens

.3 Each energy meter must:

(a) be microprocessor-based;

(b) include a built-in LCD display (with backlight) and a control keypad;

(c) be capable of displaying real-time true RMS current in amperes;

(d) be capable of displaying real-time voltage in volts;

(e) be capable of displaying real-time apparent power in kVA;

(f) be capable of displaying real-time frequency in Hz;

(g) be capable of displaying real-time active power in kilowatts;

(h) be capable of displaying real-time reactive power in kVA reactive;

(i) be capable of displaying real-time power factor;

(j) be capable of displaying energy consumption in kilowatt-hours;

(k) indefinitely store in non-volatile memory, maximum and minimum values for each parameter listed in items (c) to (j) above.

.4 Each energy meter must have integrated Modbus RTU (RS-485) communications capability.

.5 Each energy meter be configured to communicate with the DDC System.

.6 Each energy meter must be clearly labelled with the metered load.

.7 The Electrical Consultant must submit a description of the proposed metering plan to the VSB Energy Manager at the schematic design stage.

.8 Where additional metering is required for LEED projects, the Electrical Consultant must clearly identify the additional metering infrastructure in the description submitted to the VSB Energy Manager.

.9 The VSB Project Manager, in consultation with the VSB Energy Manager and the VSB Electrical Supervisor, may waive or modify the requirements described in this section.

.10 Notwithstanding any changes made to this section by the VSB Project Manager, the VSB Energy Manager, and the VSB Electrical Supervisor, the total load must be monitored by a dedicated energy meter located in the main switchboard.

.11 Where donut-type current transformers are to be used within a switchboard, these transformers must be installed in a dedicated compartment.

SECTION 26 22 00
LOW-VOLTAGE TRANSFORMERS

1 GENERAL

.1 Standards

(a) CSA-C9 "Dry-Type Transformers"

(b) CSA-C22.2 No. 47 "Air-Cooled Transformers (Dry-Type)"

(c) CSA-C22.2 No. 66.1 "Low-Voltage Transformers - Part 1: General Requirements"

(d) CSA-C22.2 No. 66.2 "Low-Voltage Transformers - Part 2: General Purpose Transformers"

.2 Acceptable Manufacturers - Low-Voltage Distribution Transformers

(a) Delta

(b) Hammond

(c) Powersmiths

(d) Rex Power Magnetics

.3 Each low-voltage transformer must be certified to meet all Zone 4 seismic requirements of the International Building Code. Installation guidelines consistent with these requirements must be provided by the manufacturer. The installation guidelines provided by the manufacturer must be strictly followed.

.4 The enclosure of each low-voltage dry-type transformer must be finished in ANSI 61 gray.

.5 The enclosure of each low-voltage dry-type transformer in a damp or wet location (this includes all outdoor locations, whether covered or not) must be rated CSA Type 4X.

.6 The enclosure of each low-voltage dry-type transformer located in an ordinary location must be designated by the manufacturer as "sprinklerproof".

.7 Each low-voltage dry-type transformer must be designed for continuous operation at rated kVA, 24 hours a day, 365 days a year, with normal life expectancy as defined in the applicable CSA standard.

.8 The enclosure of each low-voltage dry-type transformer must be vibrationally isolated from the transformer core and windings. The enclosure must be vibrationally isolated from the mounting surface.

.9 The core and windings of each low-voltage dry-type transformer of 112.5 kVA and below must be mounted on neoprene vibration dampers supplied and installed by the manufacturer.

.10 The core and windings of each low-voltage dry-type transformer above 112.5 kVA must be mounted on heavy-duty spring-loaded vibration isolators supplied and installed by the manufacturer.

.11 Unless noted otherwise in this standard, each low-voltage dry-type transformer must have a 220 degree C insulation system and a 150 degree C winding temperature rise.

.12 Insulation used in each low-voltage dry-type transformer must be flame-retardant and must not support combustion as defined in the applicable CSA standards.

.13 Each low-voltage dry-type transformer core must be constructed with high-grade, non-aging, grain-oriented silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Maximum magnetic flux densities must be substantially below the saturation point. The transformer core volume must allow efficient transformer operation at 10% above the nominal tap voltage. The core laminations must be tightly clamped and compressed. Each low-voltage dry-type core and coil assembly must be impregnated with non-hydroscopic, thermosetting varnish and cured to reduce hot spots and seal out moisture.

.14 Each low-voltage dry-type transformer must have two 2.5% voltage taps above and two 2.5% voltage taps below the nominal primary side voltage rating.

.15 Each low-voltage dry-type transformer must have an accessible interior wiring space suitable for the connection of raceway and the pulling of conductors. The wiring space for outdoor transformers must be arranged to accept raceway entering from below and must be accessible such that conductors can be easily pulled into the transformer enclosure from below.

.16 After the installation of each low-voltage dry-type transformer, primary side transformer taps must be adjusted such that the secondary side voltage is as close as possible to the specified nominal rating during normal operating conditions.

.17 Each transformer must be equipped with an internal factory-installed bonding busbar.

The internal bonding busbar must:

(a) be of tin-plated solid copper;

(b) have pre-drilled holes of various sizes to facilitate the connection of bonding conductors.

All non-current-carrying metal parts must be bonded together and to the bonding busbar at the factory.

.18 For each transformer with a wye-connected secondary winding, the star point of the secondary winding must be factory bonded to the internal bonding busbar.

.19 Transformer windings must be of copper.

.20 Each low-voltage dry-type transformer must have a minimum nominal efficiency rating equal to or exceeding the efficiency value specified in Table ~~8.1~~ 8.4.4 of ASHRAE 90.1 - ~~2010~~ 2016.

.21 Each low-voltage dry-type transformer which is to operate in a normal location must be located in an electrical room.

SECTION 26 24 13
LOW-VOLTAGE SWITCHBOARDS

1 GENERAL

.1 Standard

CSA-C22.2 No. 244 "Switchboards"

.2 Acceptable Manufacturers - Low-Voltage Switchboards

(a) Eaton

(b) Schneider

(c) Siemens

.3 Each low-voltage switchboard must be certified to meet all Zone 4 seismic requirements of the International Building Code. Installation guidelines consistent with these requirements must be provided by the manufacturer. The installation guidelines provided by the manufacturer must be strictly followed.

.4 Phase and neutral busbars must be of tin-plated solid copper. Main horizontal busbars must be mounted with all three phases arranged in the same vertical plane. Bus sizing must be based on a standard temperature rise of 65 degrees C over a 40 degree C ambient.

.5 Each low-voltage switchboard must:

(a) be self-supporting, front-accessible, and aligned at the rear such that it can be placed against a wall or left free standing in an open area;

(b) include group-mounted feeder overcurrent devices.

.6 Each low-voltage switchboard enclosure must be fabricated from heavy-gauge steel and finished in ANSI 61 gray.

.7 The enclosure of each low-voltage switchboard in an ordinary location must be designated by the manufacturer as "sprinklerproof".

.8 Each low-voltage switchboard must include a full-capacity neutral bus.

.9 All conductor hardware must be zinc-plated and of high tensile strength. All bus joints must be fitted with conical spring-type washers.

.10 All control components (e.g. fuse blocks, terminal blocks, relays, operator devices, etc.) must be marked for identification.

.11 All line and load terminals must be of the mechanical-type and must be suitable for connection to both copper and aluminum.

.12 All control wire must be of the SIS (switchboard installation system) type and must be bundled and secured with nylon ties. Insulated locking spade terminals must be provided for all control connections, except where saddle-type terminals are provided integral to a device. All terminal blocks must include suitable numbering strips inscribed with identification numbers.

.13 Each low-voltage switchboard must include an internal horizontal bonding busbar which extends through all sections of the switchboard except the pull section. Ground lugs must be provided at the beginning and end of the horizontal bonding busbar such that a minimum of four 3/0 copper conductors can be connected at each end.

Each vertical switchboard section (except the pull section) must include an internal vertical bonding busbar (bonded to the horizontal busbar) which runs the full height of the section. The enclosure of each section must be bonded to the enclosed vertical bonding busbar.

Each internal bonding busbar must:

(a) be of tin-plated solid copper;

(b) have a minimum cross section of 6mm X 50mm;

(c) have pre-drilled holes of various sizes to facilitate the connection of bonding conductors.

.14 Provide a surge protective device inside each switchboard. Surge protective devices are addressed in Section 26 43 00.

.15 Each switchboard must be located in an electrical room.

SECTION 26 24 16
PANELBOARDS

1 GENERAL

.1 Standard

CSA-C22.2 No. 29 "Panelboards and Enclosed Panelboards"

.2 Acceptable Manufacturers - Panelboards:

(a) Eaton

(b) Schneider

(c) Siemens

.3 Each panelboard must be certified to meet all Zone 4 seismic requirements of the International Building Code. Installation guidelines consistent with these requirements must be provided by the manufacturer. The installation guidelines provided by the manufacturer must be strictly followed.

.4 Phase and neutral busbars must be of tin-plated solid copper.

.5 Each panelboard must include a solid copper bonding busbar. All bonding conductors entering or leaving the panelboard must be connected to the bonding busbar. The busbar must be bonded to the panelboard box.

.6 Each panelboard must be equipped with bolt-on type circuit breakers.

.7 Each panelboard tub must be galvanized steel.

.8 Each panelboard trim must include a hinged door with rounded corners, concealed hinges, and a flush latch and lock assembly. The lock must be of the cylinder type. All panelboard locks must be keyed alike. Each panelboard trim must be finished in ANSI 61 gray.

.9 Each surface trim must be the same height and width as the panelboard box. Each flush trim must overlap the panelboard box by at least 19mm.

.10 The enclosure of each panelboard which is to be surface mounted in an ordinary location must be designated by the manufacturer as "sprinklerproof".

.11 For each panelboard which is flush mounted in a wall, two runs of 27mm raceway must be installed between the panelboard and the nearest accessible ceiling space.

.12 Each panelboard must be installed such that the top of the tub is 1800mm above the finished floor.

.13 Each panelboard mounted in a steel stud wall must be supported in a way that meets with the approval of the Seismic Engineer.

SECTION 26 24 19
MOTOR CONTROL CENTRES

1 GENERAL

.1 Acceptable Products - Motor Control Centres

(a) Eaton Freedom 2100

(b) Schneider Model 6

(c) Siemens 8PX3

(d) Allen-Bradley Centerline 2100

.2 Each motor control centre must be certified to meet all Zone 4 seismic requirements of the International Building Code. Installation guidelines consistent with these requirements must be provided by the manufacturer. The installation guidelines provided by the manufacturer must be strictly followed.

.3 Each motor control centre enclosure must be fabricated from heavy-gauge steel and must be finished in ANSI 61 gray.

.4 Phase and neutral busbars must be of tin-plated solid copper.

.5 The enclosure of each motor control centre in an ordinary location must be designated by the manufacturer as "sprinklerproof".

2 MOTOR STARTERS

.1 REFER TO SECTION 26 29 00 (LOW-VOLTAGE CONTROLLERS) FOR MOTOR STARTER REQUIREMENTS

SECTION 26 27 26
WIRING DEVICES

1 GENERAL

.1 Standards

(a) CSA-C22.2 No. 42 "General-Use Receptacles, Attachment Plugs, and Similar Wiring Devices"

(b) CAN/CSA-C22.2 No. 42.1 "Coverplates for Flush-Mounted Wiring Devices"

(c) CSA-C22.2 No. 111 "General-Use Snap Switches"

(d) CAN/CSA-C22.2 No. 144.1 "Ground Fault Circuit Interrupters"

.2 Floor outlets are not permitted.

2 RECEPTACLES - DECORA-STYLE 125VAC DUPLEX

.1 Each receptacle must:

(a) be heavy-duty industrial specification grade;

(b) incorporate a locked-in mounting strap with riveted grounding clip;

(c) include large triple-wipe brass or copper alloy contacts;

(d) include back and side wiring options;

(e) have a white face.

.2 Each receptacle must also be of the tamper-resistant type if:

(a) it is located in an area serving children 7 years of age or younger; and,

(b) it is located such that the receptacle is accessible to children 7 years of age or younger.

.3 Acceptable Products - Duplex Receptacle / Decora-Style / 125VAC / 15A / 5-15R

(a) Hubbell HBL2152WA

(b) Leviton 16262-W

(c) Pass & Seymour 26252W

.4 Acceptable Products - Duplex Receptacle / Decora-Style / 125VAC / 15A / 5-15R / Tamper-Resistant

(a) Hubbell DR15WHITR

(b) Leviton 16262-SGW

(c) Pass & Seymour TR26252W

.5 Acceptable Products - Duplex Receptacle / Decora-Style / 125VAC / 20A / 5-20R

(a) Hubbell HBL2162WA

(b) Leviton 16362-W

(c) Pass & Seymour 26352W

.6 Acceptable Products - Duplex Receptacle / Decora-Style / 125VAC / 20A / 5-20R / Tamper-Resistant

(a) Hubbell DR20WHITR

(b) Leviton 16362-SGW

(c) Pass & Seymour TR26352W

3 RECEPTACLES - GFCI

.1 Each GFCI receptacle must:

(a) be heavy-duty industrial specification grade;

(b) have a base and cover constructed of impact-resistant thermoplastic;

(c) include an LED indicator to indicate power availability;

(d) be of the Class 'A' type;

(e) include double or triple wipe silver or copper alloy contacts;

(f) include triple combination terminal screws;

(g) have a safety feature which prevents use of the receptacle when GFCI protection is lost;

(h) have a white face.

.2 Each GFCI receptacle must also be of the tamper resistant type if:

(a) it is located in an area serving children 7 years of age or younger; and,

(b) it is located such that the receptacle is accessible to children 7 years of age or younger.

.3 Acceptable Products - Duplex GFCI Receptacle / 125VAC / 15A / 5-15R

(a) Hubbell GFRST15W

(b) Leviton 7599-HGW

(c) Pass & Seymour PT1595W

.4 Acceptable Products - Duplex GFCI Receptacle / 125VAC / 15A / 5-15R / Tamper-Resistant

(a) Hubbell GFR5262SGW

(b) Leviton T7599-HGW

(c) Pass & Seymour PT1595TRW

.5 Acceptable Products - Duplex GFCI Receptacle / 125VAC / 20A / 5-20R

(a) Hubbell GFRST20W

(b) Leviton 7899-HGW

(c) Pass & Seymour PT2095W

.6 Acceptable Products - Duplex GFCI Receptacle / 125VAC / 20A / 5-20R / Tamper-Resistant

(a) Hubbell GFR5362SGW

(b) Leviton T7899-HGW

(c) Pass & Seymour PT2095TRW

4 SWITCHES - TOGGLE TYPE

.1 Each toggle switch must:

(a) be heavy-duty industrial specification grade;

(b) be constructed of impact-resistant thermoplastic;

(c) include a heavy-gauge copper alloy one-piece contact arm and terminal plate;

(d) include large silver cadmium-oxide contacts;

(e) include brass combination-head terminal screws;

(f) include thread-cleaning captive mounting screws;

(g) include a white toggle.

.2 Acceptable Products - Toggle Switch / 1-Pole / 120VAC / 20A

(a) Hubbell HBL1221W

(b) Leviton 1221-2W

(c) Pass & Seymour PS20AC1-W

5 SWITCHES - DECORA-STYLE ROCKER TYPE

.1 Each Decora-style rocker switch must:

(a) be commercial specification grade or better;

(b) be of heavy-duty impact-resistant thermoplastic construction;

(c) include brass combination-head terminal screws;

(d) include a white rocker.

.2 Acceptable Products - Decora-style Switch / 1-Pole / 120VAC / 20A

(a) Hubbell HBL2121WA

(b) Leviton 5621-2W

(c) Pass & Seymour 2621-W

6 SWITCHES - MOMENTARY-CONTACT TYPE FOR LIGHTING CONTROL

.1 Refer to Section 26 50 00 "Lighting".

7 COVERPLATES - STAINLESS STEEL

.1 Unless noted otherwise in this standard, each coverplate must be of stainless steel.

.2 Each coverplate must:

(a) be fabricated from Type 302/304 non-magnetic stainless steel with 18% chromium and 8% nickel;

(b) have a satin finish and contoured edges;

(c) be secured in place with stainless steel screws.

.3 Acceptable Manufacturers - Stainless Steel Coverplates

(a) Hubbell

(b) Leviton

(c) Pass & Seymour

.4 Where a stainless steel coverplate is specified for an outlet mounted in a concrete or masonry wall, the coverplate must be oversized.

.5 Acceptable Products - Stainless Steel Coverplate / Flush Type / 1-Gang / [1] Decora Opening

(a) Hubbell SS26

(b) Leviton SN26-N

(c) Pass & Seymour SS26

.6 Acceptable Products - Stainless Steel Coverplate / Flush Type / 2-Gang / [2] Decora Openings

(a) Hubbell SS262

(b) Leviton S262-N

(c) Pass & Seymour SS262

8 WEATHERPROOF COVERS

.1 Each weatherproof cover must be:

(a) box mounted;

(b) fabricated from cast aluminum;

(c) gasketted;

(d) secured with stainless steel screws;

.2 Where a weatherproof cover is to be installed on a flush box, the perimeter of the weatherproof cover must be sealed to the wall with clear silicone.

.3 Acceptable Product - Weatherproof-While-Not-In-Use Cover for GFCI Receptacle / 1-Gang

(a) Red Dot CWPV-G

.4 Acceptable Product - Weatherproof-While-In-Use Cover for GFCI Receptacle / 1-Gang

(a) Red Dot CKMUV

.5 Acceptable Product - Toggle Switch Cover / 1-Gang

(a) Red Dot CFST

SECTION 26 28 13
FUSES

1 GENERAL

.1 Standards

(a) CSA-C22.2 No. 248.1 "Low-Voltage Fuses - Part 1: General Requirements"

(b) CSA-C22.2 No. 248.8 "Low Voltage Fuses - Part 8: Class J Fuses"

.2 Acceptable Manufacturers - Low Voltage Fuses

(a) Cooper Bussmann

(b) Ferraz Shawmut

.3 Unless noted otherwise in this standard, each low-voltage fuse must be:

(a) High-rupturing capacity

(b) Dual-element

(c) Current limiting

SECTION 26 28 16.13
ENCLOSED CIRCUIT BREAKERS

1 GENERAL

.1 Standard

CAN/CSA-C22.2 No. 5 "Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures"

.2 Acceptable Manufacturers - Enclosed Low-Voltage Circuit Breakers

(a) Eaton

(b) Schneider

(c) Siemens

.3 Unless noted otherwise in this standard, each enclosed low-voltage circuit breaker must be of the moulded case type.

.4 Each moulded case circuit breaker must:

(a) be of the bolt-on type;

(b) be operated by a toggle-type handle and must have a quick-make, quick-break over-centre trip-free switching mechanism;

(c) operate such that tripping of the breaker is clearly indicated by the handle position;

(d) have non-welding silver alloy contacts;

(e) have arc chutes designed to quickly extinguish any arc;

(f) include a front-mounted push-to-trip button which can provide a manual means to exercise the trip mechanism.

.5 Each moulded case circuit breaker rated below 400 amperes must have a thermal-magnetic trip unit with inverse time and instantaneous tripping characteristics.

.6 Each moulded case circuit breaker rated at 400 amperes or above must have an electronic trip unit.

Each electronic trip unit must:

(a) be microprocessor-based;

(b) provide long-time, short-time, and instantaneous phase overcurrent protection.

.7 Where an electronic trip unit is specified as adjustable, the trip unit must permit adjustment of the long-time delay pickup, the short-time delay pickup, and the instantaneous pickup.

.8 Each adjustable electronic trip unit must be adjusted by a field service technician working directly for the manufacturer of the power distribution equipment.

.9 Each adjustable electronic trip unit must be adjusted by the manufacturer's field service technician such that:

(a) the breaker will be coordinated with the upstream and downstream overcurrent devices;

(b) the breaker will not trip on inrush;

(c) the breaker will provide protection for the downstream conductor;

(d) the breaker will provide protection for equipment immediately downstream if this is required.

.10 Each switchboard-mounted, panelboard-mounted, and stand-alone enclosed circuit breaker must include a mechanism which allows the handle to be padlocked in the "off" position.

SECTION 26 28 16.16
ENCLOSED SWITCHES

1 GENERAL

.1 Unless noted otherwise in this standard, each low-voltage disconnect switch must be a low-voltage safety disconnect switch.

.2 Where a single-phase, 120V load is supplied from a 15A or 20A branch circuit, the local disconnect switch may take the form of a heavy duty industrial specification grade horsepower-rated toggle switch equipped with an accessory which permits the attachment of a padlock.

2 LOW-VOLTAGE SAFETY DISCONNECT SWITCHES

.1 Standards

(a) CAN/CSA-C22.2 No. 4 "Enclosed and Dead-Front Switches"

(b) CSA-C22.2 No. 4248.8 "Fuseholders - Part 8: Class J"

.2 Acceptable Manufacturers - Low-Voltage Safety Disconnect Switches

(a) Eaton

(b) Schneider

(c) Siemens

.3 Each low-voltage safety disconnect switch must:

(a) be of the heavy-duty type;

(b) have switch blades and jaws of plated copper;

(c) have switch blades which are visible when the enclosure door is open;

(d) be load break rated;

(e) have a red handle which can be padlocked in the "off" position with a minimum of three padlocks, each with a shank diameter of 9.5mm;

(f) have a switch mechanism which provides quick-make/quick-break operation;

(g) have line terminal shields;

(h) have a Short Circuit Current Rating (SCCR) of 200 kA when protected by an integral or upstream Class "J" fuse;

(i) have a defeatable door interlock which will prevent the door from opening when the switch handle is in the "on" position;

(j) have a door interlock defeater which is front accessible;

(k) have a switch assembly and operating handle which is an integral part of the enclosure;

(l) have reinforced Class 'J' fuse clips, where the switch is fusible;

(m) include an engraved plate with "on" and "off" indications;

(n) be supplied with fuse pullers, where the switch is fusible;

(o) include a label, mounted on the inside of the door, which lists all replacement parts;

(p) include a nameplate mounted on the front of the switch enclosure which indicates the number of poles, the voltage rating, the ampere rating, and identifies a solid neutral if present.

.4 Each safety disconnect switch enclosure in an ordinary location must be designated by the manufacturer as "sprinklerproof".

.5 Unless noted otherwise in this standard, the enclosure of each low-voltage safety disconnect switch in a damp or wet location must be rated CSA Type 4X.

.6 Each low-voltage safety disconnect switch located in an elevator machine room (for the purpose of disconnecting power from the elevator machinery) must be equipped with an auxiliary switch. The auxiliary switch must include one normally-open contact and one normally-closed contact. The contacts must operate prior to the breaking of the main switch.

3 LOW-VOLTAGE MOULDED-CASE SWITCHES

.1 Reference Standard

CAN/ CSA-C22.2 No. 5 "Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures"

.2 Acceptable Manufacturers - Low-Voltage Moulded-Case Switches

(a) Eaton

(b) Schneider

(c) Siemens

.3 Each low-voltage moulded-case switch must:

(a) be operated by a toggle-type handle and must have a quick-make, quick-break over-centre trip-free switching mechanism;

(b) have non-welding silver alloy contacts;

(c) have arc chutes designed to quickly extinguish any arc.

.4 Each low-voltage moulded-case switch must include a mechanism which allows the switch to be padlocked in the "off" position.

SECTION 26 29 00
CONTROLLERS

1 GENERAL

.1 Standard

CAN/CSA-C22.2 No. 60947-4-1 "Low-Voltage Switchgear and Controlgear - Part 4-1: Contactors and Motor-Starters - Electromechanical Contactors and Motor-Starters"

.2 Acceptable Manufacturers - Stand-Alone and MCC-Based Magnetic Controllers

(a) Eaton

(b) Schneider

(c) Siemens

.3 Each stand-alone and MCC-based magnetic controller must be NEMA rated.

.4 A heavy-duty 3-position maintained ON-OFF-AUTO selector switch with an integrated green illuminated pilot light and engraved position markings must be mounted in the enclosure door of each stand-alone or MCC-based magnetic controller.

.5 Each contactor which forms part of a magnetic controller must:

(a) include double-break silver alloy contacts;

(b) incorporate straight-through wiring;

(c) include a contactor coil of molded construction which is permanently marked with voltage, frequency, and part number;

(d) include two normally-open and two normally closed contacts auxiliary to the contactor coil.

.6 The enclosure of each stand-alone magnetic controller in an ordinary location must be designated by the manufacturer as "sprinklerproof".

.7 Each MCC-based motor starter must be of the combination type.

.8 Each overload relay which forms part of a stand-alone or MCC-based motor starter must:

(a) be of the ambient compensated bimetallic-type;

(b) include interchangeable heaters calibrated for 1.0 and 1.15 service factor motors;

(c) include electrically isolated normally-open and normally-closed contacts auxiliary to the relay;

(d) include visual trip indication;

(e) include a conveniently operable test trip feature which does not require removal of starter components;

(f) incorporate adjustability of +/- 24%;

(g) incorporate single-phase sensitivity;

(h) include an isolated alarm contact;

(i) include a manual reset button which is operable from the outside of the starter enclosure.

SECTION 26 43 13
SURGE PROTECTIVE DEVICES

1 GENERAL

.1 Standard

UL 1449 "Surge Protective Devices"

.2 Where a customer-owned indoor or outdoor unit substation is to be specified, the substation must be protected on the primary side by a station class surge arrester.

.3 A surge protective device must be mounted internal to each:

(a) switchboard;

(b) distribution panelboard;

(c) branch panelboard in a telecom room.

.4 Acceptable Products - Surge Protective Devices

(a) Eaton SPD Series

(b) Schneider Square D Surgelogic IMA Series

(c) Siemens TPS3 Series

SECTION 26 50 00
LIGHTING

1 RECOMMENDED MAINTAINED ILLUMINANCE AND UNIFORMITY TARGETS

.1 TEACHING SPACES / RESOURCE ROOMS / OFFICES / STAFF ROOMS / WORK ROOMS / MULTI-PURPOSE ROOMS / FIRST AID ROOMS / CAFETERIAS / KITCHENS / COMMONS / SPACES FOR GATHERING AND INTERACTION

Recommended Maintained Horizontal Average Illuminance Target:
500 lux at 760mm above the finished floor

Recommended Uniformity Target (Average : Minimum):
2:1

.2 LIBRARIES

Recommended Maintained Horizontal Average Illuminance Target:
500 lux at 760mm above the finished floor

Recommended Maintained Vertical Average Illuminance Target:
300 lux between 760mm and 2000mm above the finished floor.

Recommended Uniformity Target (Average : Minimum):
2:1

.3 ELECTRICAL ROOMS / TELECOM ROOMS / MECHANICAL ROOMS / ELEVATOR MACHINE ROOMS / OTHER SERVICE ROOMS

Recommended Maintained Horizontal Average Illuminance Target:
500 lux at the finished floor

Recommended Maintained Vertical Average Illuminance Target:
300 lux between 760mm and 2000mm above the finished floor.

Recommended Uniformity Target (Average : Minimum):
2:1

.4 WASHROOMS / STORE ROOMS / CORRIDORS / VESTIBULES / STAIRWAYS

Recommended Maintained Horizontal Average Illuminance Target:
300 lux at the finished floor

Recommended Uniformity Target (Average : Minimum):
2:1

.5 GYMNASIA

Luminaires must be dimmable to 10% of the maximum illuminance.

Recommended Maximum Horizontal Average Illuminance Target:
750 lux at the finished floor

Recommended Uniformity Target (Average : Minimum):
2:1

.6 EXTERIOR COVERED AREAS AND ENTRANCES

Recommended Maintained Horizontal Average Illuminance Target:
300 lux at grade level

Recommended Uniformity Target (Average : Minimum):
3:1

.7 EXTERIOR PERIMETER WALKWAYS

Recommended Maintained Horizontal Average Illuminance Target:
100 lux at grade level

Recommended Uniformity Target (Average : Minimum):
3:1

.8 EXTERIOR PARKING AREAS

Recommended Maintained Horizontal Average Illuminance Target:
30 lux at grade level

Recommended Uniformity Target (Average : Minimum):
3:1

2 LUMINAIRE TYPES

.1 TEACHING SPACES / RESOURCE ROOMS / OFFICES / STAFF ROOMS / MULTI-PURPOSE ROOMS / FIRST AID ROOMS / CAFETERIAS / MEETING ROOMS / BREAKOUT ROOMS / SPECIAL EDUCATION ROOMS / MAIN CORRIDORS / LARGE VESTIBULES / MAIN STAIRWAYS / COMMONS / SPACES FOR GATHERING AND INTERACTION / OTHER SPECIAL PURPOSE ROOMS

Where the ceiling height permits, and where the ceiling has a reflectance of 80% or more, luminaires ~~must~~ may be of the linear LED direct-indirect type~~.~~ , or may be recessed 2x2, 2x4 luminaires and must comply with the following:

1. Direct/indirect recessed luminaires, with the LED chips aimed above the horizontal plane and light reflected or refracted down within the fixture using internal lenses and/or internal reflectors. Luminaires that have LEDs aimed at or below the horizontal plane do not meet the intent of this requirement.
2. Minimum CRI: 90.
3. Minimum Efficacy: 130 lumens / watt.
4. Minimum Lamp Life (L70): 200,000 Hours.
5. Installed in T-bar grid ceilings with lay-in ceiling panels only.

.2 SMALL VESTIBULES / SECONDARY CORRIDORS / SECONDARY STAIRWAYS

LED recessed downlights

.3 WASHROOMS

LED recessed downlights
LED wall brackets above mirrors

.4 SERVICE SPACES

LED wraparound luminaires

.5 STOREROOMS / WORK ROOMS / KITCHENS

LED wraparound luminaires for GWB and open ceilings / 2X4 LED panels for Tbar ceilings

.6 GYMNASIA

High-Bay LED luminaires

.7 EXTERIOR COVERED AREAS

LED recessed downlights
LED surface cylinders
LED canopy luminaires

.8 EXTERIOR PERIMETER AREAS AND EXTERIOR ROOF ACCESS POINTS

LED wall packs

.9 EXTERIOR PARKING AREAS

LED lamp standards

.10 Bollard type luminaires are not acceptable.

.11 The use of wall and step mounted luminaires which are to be recessed in concrete or masonry must be authorized by the VSB Electrical Supervisor. Provide the VSB Electrical Supervisor with specifications and samples during the design phase.

.12 All exterior luminaires must be of the full cutoff type.

3 PARKING AREA LAMP STANDARDS

.1 Each lamp standard head must be of the LED type.

.2 All poles and pole bases must be engineered to withstand worst case local wind, snow, and ice loads with appropriate safety factors.

.3 All poles and pole bases must be engineered to withstand worst case gravitational loads with appropriate safety factors.

.4 Each pole must be CSA approved.

.5 Unless noted otherwise in this paragraph, each pole must be of aluminum. If the application requirements cannot be satisfied with an aluminum pole, special permission to use a steel pole must be obtained from the VSB Electrical Supervisor.

.6 Acceptable Manufacturers - Lamp Standard Poles

(a) Foxfab Metal Works

(b) Nova Pole International

(c) West Coast Engineering Group

.7 Each pole base must be a pre-engineered, pre-cast, pyramidal concrete pole base.

.8 Acceptable Products - Pole Base for Poles 25 Feet and Under

(a) 1800mm Parking Lot Pole Base by The Langley Concrete Group

(b) approved equivalent

.9 A WireSentry anti-theft device manufactured by Trans Canada Traffic must be installed in each pole.

4 COLOUR TEMPERATURE AND COLOUR RENDERING INDEX

.1 Unless noted otherwise in this standard, the Correlated Colour Temperature (CCT) of each artificial light source must be 3500K.

.2 Unless noted otherwise in this standard, the Colour Rendering Index (CRI) of each artificial light source must be equal to or greater than 85.

.3 Tunable white LED technology may be installed in Quiet Rooms (also known as Sensory Rooms). Where tunable white technology is installed in a Quiet Room or Sensory Room, the colour temperature of the luminaires must be manually controllable.

5 PRIMARY LIGHTING CONTROL SYSTEM

.1 A complete and functional Primary Lighting Control System must be provided.

.2 The Primary Lighting Control System must control all luminaires in the facility except those luminaires in spaces where automatic control could create a safety hazard or security problem.

.3 Luminaires in a space where automatic control could create a safety hazard or security problem must be directly controlled by one or more toggle type switches.

.4 Luminaires in a service space must be controlled directly by one or more toggle type switches.

.5 The Primary Lighting Control System will not control daylight harvesting systems. Daylight harvesting systems are described later in this section.

.6 The Primary Lighting Control System must include:

(a) factory assembled lighting control panels, each complete with an enclosure, relays, one or more power supplies, one or more lighting controllers, one or more input modules, internal wiring, and terminations;

(b) a weatherproof exterior digital daylight sensor which accommodates a light level range of 0 to 65,000 lux;

(c) dual-technology occupancy sensors as required, each with a mounting bracket which permits full vertical and horizontal adjustability;

(d) lighting control stations, each with one or more momentary contact push buttons and, where required, one or more dimmer controls;

(e) high-security control station enclosures as required, each with a hinged and key-lockable door;

(f) raceway and wiring from the exterior daylight sensor to the closest control panel;

(g) raceway and wiring from each occupancy sensor to the closest control panel;

(h) raceway and wiring from each control station to the closest control panel;

(i) raceway and wiring required to network all control panels together;

(j) raceway and wiring from one control panel to the closest DDC I/O point;

(k) all terminations as required;

(l) a complete and functional graphic lighting control system interface which is seamlessly integrated with the overall DDC graphic control interface;

(m) all required software;

(n) all other equipment and material required to make the system complete and functional.

.7 The sole-source DDC contractor for the VSB is ESC Automation. The Electrical Contactor must subcontract ESC Automation to:

(a) provide a detailed design for the Primary Lighting Control System;

(b) provide complete documentation for the Primary Lighting Control System;

(c) provide all required programming for the Primary Lighting Control System;

(d) provide all commissioning for the Primary Lighting Control System;

(e) supply all components for the Primary Lighting Control System;

.8 The lighting control system interface provided by ESC Automation must include graphics which show all interior and exterior lighting zones.

The lighting control system interface must display the real-time state of each lighting zone.

It must be possible to override (on or off) the state of any lighting zone through the lighting control system interface.

It must be possible to establish and change a time schedule for any lighting zone or group of lighting zones through the lighting control system interface.

Once all occupancy sensors associated with a given AUTO OFF lighting zone sense no occupants, there must be a time delay before the system turns the luminaires off. It must be possible to set and change the time delay through the lighting control system interface. (The time delay must not be set at each individual occupancy sensor.) The time delay must initially be set at 15 minutes.

.9 MANUAL ON-OFF / AUTO OFF

This item addresses teaching spaces, resource rooms, offices, staff rooms, multi-purpose rooms, first aid rooms, cafeterias, kitchens, work rooms, meeting rooms, breakout rooms, special education rooms, gymnasia, storage rooms, and other special purpose rooms.

One or more lighting control stations must be located in each room.

In each room, a lighting control station must be located on the latch side of each entrance doorway. It must be possible to turn the luminaires on and off from each lighting control station in the room.

One or more occupancy sensors must be located in each room. In each room, luminaires must turn off automatically when the room has been unoccupied for 15 minutes.

.10 AUTO ON-OFF

In each washroom and change room, luminaires must turn on when an occupant enters and turn off when the room has been unoccupied for 15 minutes. ~~(Although change rooms are not specifically sanctioned for full automatic control in ASHRAE 90.1 - 2010, local manual control would present a safety hazard.)~~

.11 SCHEDULED ON-OFF / AUTO ON-OFF / MANUAL OVERRIDE ON-OFF

This item addresses areas such as corridors, stairways, vestibules, and commons. These areas will be referred to as "common areas".

For each day when VSB staff are present, luminaires in common areas must:

(a) be under occupancy sensor control from 1200AM to 630AM;

(b) be on from 630AM to 630PM;

(c) be under occupancy sensor control from 630PM to 1200AM.

For each day when VSB staff are not present, luminaires in common areas must operate under occupancy sensor control only.

A manual override control station must be provided in each Janitor Room on each floor of each building in the school. Each manual override control station must include a momentary contact push button which will cause all common area luminaires (in the area associated with the Janitor Room) to turn on or remain on for 2 hours after the push button is pushed.

The manual override control station in each Janitor Room on the main floor of a building must include a momentary contact push button which will cause the lighting in each stairway (with a bottom landing in the area associated with the Janitor Room) to turn on or remain on for 2 hours after the push button is pushed.

The manual override control station in the main Janitor Room on the main floor of a building must include a momentary contact push button which will cause the exterior lighting (of the building) to turn on or remain on for 2 hours after the push button is pushed.

.12 Where there are windows on one wall in a space, luminaires are to be arranged in rows parallel to the window wall. Where windows are present on more than one wall, luminaires must be arranged in rows parallel to the wall which supports the windows which have the greater aggregate surface area.

It must be possible to control each row of luminaires independently from each manual control station in the space. Alternatively, provide two dimming zones, each controlled by a dimmer switch at each lighting control station: one for a row of luminaires at the teaching wall and one for the remaining luminaires in the room.

.13 In general, exterior luminaires must turn on at dusk and turn off at dawn.

A separate exterior lighting zone must be established for each side (north / south / east / west) of each building.

A separate exterior lighting zone must be established for the luminaires under each canopy.

A separate exterior lighting zone must be established for the lamp standards in each parking area.

A separate exterior lighting zone must be established for each exterior illuminated sign.

It must be possible for VSB staff to program any exterior lighting zone (through the lighting control system interface) to turn off at a certain time during the dark hours.

.14 Each lighting control panel enclosure must be a Delta DLS-Exxx Series cabinet.

.15 Each lighting controller must be a Delta DLC-Pxxx Series controller.

.16 Each lighting relay must be a Delta WR Series 20A relay.

.17 Each 1-button switch station must be a Douglas WSR-8711 switch station.

.18 Each 2-button switch station must be a Douglas WSR-8712 switch station.

.19 Each 3-button switch station must be a Douglas WSR-8713 switch station.

.20 Each 4-button switch station must be a Douglas WSR-8714 switch station.

.21 Each dimmer control station must be a Douglas WRD-8701 dimmer control station.

.22 Each switch station coverplate must be type 302-304 stainless steel.

.23 Each occupancy sensor must be an IR-Tec OS-550DT dual-technology occupancy sensor.

.24 Each exterior digital daylight photosensor must be a Douglas WPS-5527K Outdoor Daylight Sensor.

6 DAYLIGHT HARVESTING SYSTEMS

.1 Daylight harvesting is to be implemented only when required by ASHRAE 90.1 - ~~2010~~ 2016 (Energy Standard for Buildings Except Low-Rise Residential Buildings).

.2 A "stand-alone" daylight harvesting system operates independently of the DDC system.

.3 In general, daylight harvesting activity within a given space must be implemented by a single stand-alone daylight harvesting system.

.4 More than one stand-alone daylight harvesting system may operate within a large space if the systems will not interfere with each other.

.5 Each daylight harvesting system must include:

(a) a photosensor;

(b) a power supply;

(c) control hardware and firmware (this can be integrated into the power supply or the photosensor);

(d) all required wiring, terminations, raceway, and boxes.

.6 Each daylight harvesting system must provide a 0-10V output signal to selected dimming ballasts in the area served by the system.

.7 Each daylight harvesting system must be of the closed-loop type. Each photosensor must be aimed at the floor.

.8 It must be possible to program each daylight harvesting system by means of a hand-held remote setup control.

.9 It must be possible to adjust each daylight harvesting system by means of a hand-held remote adjustment control.

.10 For each facility where daylight harvesting systems are installed, [3] handheld remote setup controls and [3] handheld remote adjustment controls must be provided to VSB staff.

.11 Each daylight harvesting system must, where practical, include a luminaire-integrated photosensor.

.12 In the case where a photosensor cannot be integrated into a luminaire, a ceiling-mounted photosensor may be used.

.13 Each daylight harvesting system must be commissioned by a factory-trained technician who is employed directly by the manufacturer or the manufacturer's agent.

.14 Acceptable Products - Luminaire-Integrated Photosensor

(a) WattStopper FD-301 Photosensor

The WattStopper FD-301 Photosensor must be accompanied by a WattStopper FS-PP v2 Power Pack (also to be integrated with the luminaire).

.15 Acceptable Products - Ceiling-Mounted Photosensor

(a) WattStopper LS-301 Photosensor

The WattStopper LS-301 Photosensor must be accompanied by a WattStopper 24VDC Power Pack. The power pack must be mounted in a labelled enclosure. The enclosure must be mounted at an accessible location within the space occupied by the photosensor. (The enclosure can be mounted in the ceiling space above a Tbar ceiling.)

.16 Where the Electrical Consultant believes that daylight harvesting is required by Code in a given gymnasium, the Electrical Consultant must design the system such that it can be switched off by means of a toggle switch.

7 EMERGENCY LIGHTING

.1 Codes and Standards

(a) CSA-C22.2 No. 141 "Unit Equipment for Emergency Lighting"

(b) CAN/CSA-C860 "Performance of Internally Lighted Exit Signs"

(c) Vancouver Building By-law Subsection 3.2.7 "Lighting and Emergency Power Systems"

(d) BC Electrical Code Section 46 "Emergency power supply, unit equipment, exit signs, and life safety systems

.2 Acceptable manufacturers - Emergency Lighting Equipment

(a) Emergi-Lite

(b) Lumacell

(c) Ready-Lite

(d) Nexus

.3 A complete and functional Nexus Wireless Emergency Lighting Management System must be provided to support all new emergency lighting infrastructure. (Each new battery pack and self-powered exit sign must be Nexus compatible.)

.4 When normal power fails, emergency lighting systems must provide an average illuminance level (on the floor) of not less than 10 lux:

(a) at each exit door;

(b) in each exit stair;

(c) in each corridor;

(d) in each vestibule:

(e) in each service room or service space;

(f) along principal routes providing access to exit in an open floor area or performance space;

(g) in each washroom;

(h) in each kitchen and food preparation area;

(i) in each staff room;

(j) in each main office area.

The minimum emergency illuminance level at any point on the floor at the location where emergency lighting is required, must not be less than 1 lux.

.5 Power for emergency lighting must be provided by battery units. Emergency illumination must be provided by emergency luminaires attached to a battery unit, integrated with a battery unit, or supplied remotely from a battery unit.

Where the Electrical Consultant believes that a generator should supply all or some of the emergency luminaires in a given facility, he is invited to provide documentation to the VSB Electrical Supervisor which shows that the life cycle cost of the generator option (for the facility in question) is lower than that of the battery pack option.

.6 Each emergency luminaire must be of the LED type. Each emergency luminaire which is attached to a battery pack or supplied remotely from a battery pack must be of the mini-head style.

.7 Each remote emergency luminaire must have at least two heads.

.8 Where a source of emergency illumination is required at a battery pack, a minimum of two single-head emergency luminaires must be attached to the battery pack.

.9 Unless specified otherwise by the Vancouver Building By-law, each battery pack must have a 30-minute rating which is equal to or greater than the total load carried by the battery pack.

.10 Each battery pack which supplies one or more remote emergency luminaires must be rated at 12 volts.

.11 Each emergency lighting battery pack, emergency luminaire, combination unit, and exit sign must have a white finish.

.12 A "Schedule of Emergency Lighting Battery Packs" must be provided on the Electrical Drawings. The schedule must have the following columns:

(a) BATTERY PACK IDENTIFIER

(b) LOCATION

(c) AC VOLTAGE

(d) DC VOLTAGE

(e) DESCRIPTION OF EMERGENCY LUMINAIRES ON BATTERY PACK

(f) DESCRIPTION OF EACH REMOTE EMERGENCY LUMINAIRE

(g) NUMBER OF REMOTE EMERGENCY LUMINAIRES

(h) TOTAL LOAD (WATTS)

(i) SIZE OF DC WIRING (AWG)

(j) DESCRIPTION OF AC CIRCUIT SUPPLYING BATTERY PACK

The Electrical Consultant must place a note at the bottom of the schedule which specifies that for each battery pack, the total load must be less than the maximum load rating of the battery pack.

.13 The Electrical Consultant must estimate the wiring distance for each DC wiring branch and confirm that the maximum voltage drop along each branch (for the load supported by the branch) will be less than the maximum voltage drop permitted by Code.

.14 Each battery pack and combination unit must be connected to the unswitched part of the lighting circuit in the space served by the battery pack or combination unit. If the lighting is controlled by a relay located in a lighting control panel, the connection must be made between the power panelboard and the lighting control panel. A junction box must be provided near each panelboard (where lighting circuits originate) in order to facilitate emergency lighting connections.

.15 A power outlet must be provided within 150mm of the power cord connection location on each battery pack. The power outlet must be connected to the unswitched part of the lighting circuit which is to supply power to the battery pack.

Each battery pack must be equipped with a heavy duty flexible cord and plug. Each cord and plug must be white. Excess power cord must be neatly and tightly coiled and secured in place with a white velcro strap.

Each power outlet must include a 125VAC, 20A, 5-20R duplex receptacle with a white decorator-style face. The receptacle must be listed as an acceptable product in Section 26 27 26 (Wiring Devices).

Each power outlet must be single-gang and flush mounted where possible.

Each flush mounted power outlet must include a Type 302-304 stainless steel coverplate with satin finish, contoured edges, and stainless steel screws.

Each surface mounted power outlet must include a galvanized steel coverplate of the surface type with curl-over edges.

.16 A wire guard must be specified for each emergency lighting system component which is located in a gymnasium or other space where the component would be susceptible to damage without protection.

For each component susceptible to damage without protection, a heavy-duty zinc-plated wire guard of 7-gauge welded steel must be specified.

.17 Where practical, battery packs serving remote emergency luminaires in finished areas are to be placed in service rooms, janitor rooms, or storage rooms.

.18 An exit sign must be provided:

(a) at each exit door;

(b) at each door leading to an "access to exit" route;

(c) to identify each principal egress route within a building.

.19 Each exit sign must be of the LED type.

.20 Each exit sign must be of the self-powered type.

.21 Refer to the subsection entitled "Identification" in Section 01 00 50 "General Electrical Requirements" for labelling requirements related to emergency lighting equipment.

SECTION 26 62 00
ELECTRIC HEATING PRODUCTS

1 BASEBOARD HEATERS

.1 Each baseboard heater must be a Stelpro Series 'B' convector baseboard or approved equivalent.

.2 Unless specified otherwise by the Mechanical Consultant, each baseboard heater must have a built-in thermostat.

.3 Each baseboard heater must have a white finish.

2 FAN FORCED HEATERS

.1 Each fan forced heater must be a Stelpro Model 'WF' or an approved equivalent model.

.2 Unless specified otherwise by the Mechanical Consultant, each fan forced heater must have a built-in thermostat.

.3 Each fan forced heater must have a white finish.

3 HAND DRYERS

.1 Acceptable Product - Hand Dryer

(a) Dimplex "One" D20001WH

SECTION 27 10 00
TELECOM CABLING

1 GENERAL

.1 Standards

(a) TIA Standard 568-C.0 (Generic Telecommunications Cabling for Customer Premises)

(b) TIA Standard 568-C.1 (Commercial Building Telecommunications Cabling Standard)

(c) TIA Standard 568-C.2 (Balanced Twisted Pair Telecommunications Cabling Systems Standard)

(d) TIA Standard 568-C.3 (Optical Fiber Telecommunications Cabling Systems Standard)

(e) TIA Standard 569-C (Commercial Building Standard for Telecommunications Pathways and Spaces)

(f) TIA Standard 606-B (Administration Standard for Telecommunications Infrastructure)

(g) TIA Standard 607-B (Commercial Building Grounding and Bonding Requirements for Telecommunications)

(h) TIA Standard 758-B (Customer-owned Outside Plant Telecommunications Cabling Standard)

.2 The following infrastructure and services (when specified as part of a telecom cabling project) must be provided by a certified CommScope system vendor:

(a) telecom racks and accessories;

(b) horizontal CAT6 copper cabling, terminations, and patch panels;

(c) copper backbone cabling and copper BIX terminations (for emergency phone lines);

(d) fiber backbone cabling, terminations, and panels;

(e) other cabling and terminations as described in this section;

(f) outlet straps and port blanks;

(g) labelling, documentation, and commissioning (including testing).

.3 CAT6 and fiber cabling infrastructure must be manufactured by CommScope.

.4 CAT6 and fiber cabling systems must be certified by CommScope.

.5 The following Certified CommScope System Vendors are approved for VSB projects:

(a) 4th Utility

(b) BKS Cablecom

(c) Houle Electric

(d) Sasco Contractors

.6 A telecom cabling contractor on the approved list may not subcontract any part of a VSB telecom cabling project to another contractor not on the approved list.

.7 The following infrastructure (where specified as part of a telecom cabling project) must be provided by a licensed Electrical Contractor:

(a) telecom raceway including all required conduit, tubing, duct, wireway, connectors, couplings, fittings, fasteners, clamps, adapters, device boxes, outlet boxes, pull boxes, supports, hangers, steel framing elements, pull cords, and other associated items;

(b) telecom cable tray;

(c) telecom bonding infrastructure;

(d) power outlets;

(e) combination outlet boxes, dividers, receptacles, and stainless steel coverplates;

(f) UPS units and UPS bypass units;

(g) seismic restraint infrastructure;

(h) firestopping.

2 TELECOM ROOMS - GENERAL

~~.1 In each new VSB facility, one or more telecom rooms must be provided such that the cabling distance between any user outlet and the corresponding patch panel is less than 90 meters.~~

~~.2 The first telecom room must be designated as the Main Telecom Room. All other telecom rooms must be designated as auxiliary telecom rooms.~~

.3 Each telecom room must have an open ceiling.

.4 The main telecom room must be sized to accommodate:

(a) a rack lineup consisting of a minimum of [2] full-height, 2-post racks;

(b) a 1200mm wide wall section (clear from the floor to a height of 2440mm) for intrusion detection infrastructure;

(c) a 1200mm wide wall section (clear from the floor to a height of 2440mm) for a wall mounted audio rack;

(d) a 1200mm wide wall section (clear from the floor to a height of 2440mm) for Telus copper and fiber demarcations (if the demarcations are to be located in the main telecom room);

(e) a 1200mm wide wall section (clear from the floor to a height of 2440mm) for a fire alarm control panel and autodialer;

(f) additional space as required.

~~There must be [1] meter of clear working space available at the front and back of the rack lineup after all equipment has been installed. It must be possible to walk around one end of the rack lineup.~~

There must be [1] meter of clear working space available in front of each 1200mm wide wall section described previously.

The ceiling of the main telecom room must not be lower than 2750mm AFF.

~~.5 Each auxiliary telecom room must be sized to accommodate a wall mount rack and 600mm of wall space (clear from the floor to a height of 2440mm) on each side of the rack.~~

~~There must be [1] meter of clear working space available in front of the rack and wall sections after all equipment has been installed. (It is acceptable for the required clearance to exist only when the door is open.)~~

.6 Each telecom room must be equipped with plywood backboards. Refer to the subsection entitled "Plywood in Electrical and Telecom Rooms" in Section 01 00 50 "General Electrical Requirements".

3 TELECOM ROOMS - POWER REQUIREMENTS

~~.1 [1] power outlet must be provided for each telecom rack (wall mount or stand-alone). The power outlet must be supplied from a dedicated 1P2W, 120V, 20A circuit. The power outlet must incorporate a 5-20R duplex receptacle (which can accept a 15A or 20A plug).~~

.2 A UPS unit must be provided for each telecom rack.

Each UPS must:

(a) be rack mountable;

(b) be of the online double conversion type;

(c) be rated at 1500VA;

(d) have an automatic bypass feature.

Each UPS unit must be mounted near the bottom of the associated rack.

Acceptable Products:

(a) Eaton Powerware 9PX1500RTN 1500VA rackmount UPS unit;

(b) An equivalent product approved by the Infrastructure Manager of the VSB Learning and Information Technology Division.

.3 For each UPS unit, a rack mountable maintenance bypass unit must be provided in order to facilitate the hot swapping of the UPS.

Each maintenance bypass unit must be mounted immediately above the associated UPS unit.

Acceptable Products:

(a) Eaton EHBPL1500R-PDU1U rackmount UPS bypass unit;

(b) An equivalent product approved by the Infrastructure Manager of the VSB Learning and Information Technology Division.

.4 [2] power outlets must be provided for convenience use in the Main Telecom Room. Each power outlet must be supplied from a dedicated 1P2W, 120V, 20A circuit. Each power outlet must incorporate a 5-20R duplex receptacle (which can accept a 15A or 20A plug).

.5 [1] power outlet must be provided for convenience use in each auxiliary telecom room. The power outlet must be supplied from a dedicated 1P2W, 120V, 20A circuit. The power outlet must incorporate a 5-20R duplex receptacle (which can accept a 15A or 20A plug).

.6 A dedicated 1P2W, 120V, 15A power circuit must be provided for each of the following hard-wired loads located in the Main Telecom Room:

(a) the fire alarm control panel;

(b) the fire alarm autodialer;

(c) the intrusion control panels.

.7 A 3-gang power outlet must be provided for the audio rack in the Main Telecom Room. The outlet must include [3] 5-20R duplex receptacles. Each receptacle must be supplied from a separate 1P2W, 120V, 20A dedicated power circuit.

4 TELUS DEMARCATIONS

.1 If possible, Telus copper and fiber demarcations must be located in the Main Telecom Room.

5 COPPER BACKBONE CABLING AND TERMINATIONS

.1 Copper backbone cabling is primarily used for the distribution of emergency telephone lines.

.2 In the case where the Telus copper demarcation cannot be located in the Main Telecom Room, a copper backbone cable must be provided between the Telus copper demarcation and the Main Telecom Room.

.3 For each auxiliary telecom room, a copper backbone cable must be provided between that telecom room and the Main Telecom Room.

.4 Each copper backbone cable must be 25-pair Category 3.

.5 Each end of each copper backbone cable must terminate on a Belden BIX Connector. Each BIX connector must be installed in a BIX mount.

~~.6 Each copper backbone cable must run in 53mm raceway.~~

6 FIBER BACKBONE CABLING AND TERMINATIONS

.1 In the case where the Telus fiber demarcation cannot be located in the Main Telecom Room, a 12-strand fiber backbone cable must be provided between the Telus fiber demarcation and the Main Telecom Room.

.2 For each auxiliary telecom room, a 6-strand fiber backbone cable must be provided between that telecom room and the Main Telecom Room.

.3 Each backbone fiber cable in an ordinary location must be a tightly-buffered 50/125 micron OM3 multimode fiber cable.

.4 Each backbone fiber cable in a wet or damp location must be a loose tube gel-filled 50/125 micron multimode OSP fiber cable.

.5 Each end of each strand (of each backbone fiber cable) must be terminated on an LC connector installed in a rack mounted fiber panel.

~~.6 Each fiber backbone cable must run in 53mm raceway.~~

7 FLOOR STANDING 2-POST TELECOM RACKS

.1 The Main Telecom Room must contain a minimum of [2] floor-standing 2-post telecom racks. The racks must be mounted side-by-side and bolted together. The racks must be oriented perpendicular to a wall. The end of the rack lineup which is closest to the wall must be positioned 150mm from the wall.

.2 Each floor standing 2-post telecom rack must be a Middle Atlantic RLA19-1245B rack.

~~.3 Each floor standing 2-post telecom rack must include [2] Middle Atlantic RLA-CC vertical cable managers.~~

.4 Middle Atlantic HHCM-2 hinged horizontal cable managers must be provided in each floor standing 2-post telecom rack such that there will be a cable manager beneath each patch panel.

.5 A length of Unistrut channel must be provided between the top of each floor standing 2-post telecom rack and the wall (which is parallel to the long axis of the rack) for additional seismic stability.

~~**8 WALL MOUNT TELECOM RACKS**~~

~~.1 Each auxiliary telecom room must contain at least [1] wall mount telecom rack.~~

~~.2 Each wall mount telecom rack must be a Middle Atlantic WM-30-18 rack.~~

~~.3 Each wall mount rack must include Middle Atlantic HHCM-2 hinged horizontal cable managers such that there will be a cable manager beneath each patch panel.~~

9 CATEGORY 6 HORIZONTAL COPPER CABLING, TERMINATIONS, AND PATCH PANELS

.1 Each telecom jack in each user outlet must terminate a Category 6 horizontal copper telecom cable which originates at a patch panel mounted in a rack in the telecom room which is closest to the user outlet.

.2 Each horizontal cable must be Category 6 with four, balanced, 100 ohm, unshielded twisted pairs of solid 24 AWG copper.

.3 Each horizontal cable must be plenum rated and marked "CMP" (FT6).

.4 Each horizontal cable must be white.

.5 Each user outlet jack must be a Category 6, RJ45 jack.

.6 Each user outlet jack must be white.

.7 Each horizontal jack termination must conform to the TIA/EIA 568A pin configuration.

.8 Each patch panel must be a Category 6 patch panel with (48) white modular Category 6 RJ45 jacks.

.9 A sufficient number of patch panels must be provided in each telecom room to accommodate all required terminations and to accommodate a number of spare ports equal to at least 20% of the required terminations.

.10 Patch cords will be supplied and installed by the VSB.

10 COMBINATION OUTLETS

.1 Where power and telecom services are required in the same area, combination type outlets must be used.

.2 A typical 4-gang combination outlet must be arranged as follows:

Gang 1 - Duplex Decora-style receptacle

Gang 2 - Duplex Decora-style receptacle

Gang 3 - Decora-style telecom strap with [3] RJ45 ports

Gang 4 - Decora-style blank insert

.3 A typical flush 4-gang combination outlet must include the following:

(a) [1] 4-gang deep masonry box

(b) [1] 4-gang mud ring

(c) [1] steel partition between Gang 2 and Gang 3

(d) [1] 4-gang (Type 302/304 stainless steel) coverplate with [4] Decora-style openings

(e) [2] heavy-duty industrial grade Decora-style white duplex receptacles

(f) [1] white Decora-style telecom strap with [3] RJ45 ports

(g) [1] white Decora-style blank insert

(h) Up to [3] CAT6 RJ45 telecom jacks (each of which must terminate a horizontal CAT6 telecom cable which originates at a patch panel in the closest telecom room)

(i) Port blanks as required

.4 A typical surface 4-gang combination outlet must include the following:

(a) [1] 4-gang GB Series gang box by Code Electric

(b) [1] steel partition (available from Code Electric for GB Series boxes) between Gang 2 and Gang 3

(c) [1] 4-gang galvanized steel surface cover with curl-over edges and [4] Decora-style openings (available from Code Electric for GB Series boxes)

(d) [2] heavy-duty industrial grade Decora-style white duplex receptacles

(e) [1] white Decora-style telecom strap with [3] RJ45 ports

(f) [1] white Decora-style blank insert

(g) Up to [3] CAT6 RJ45 telecom jacks (each of which must terminate a horizontal CAT6 telecom cable which originates at a patch panel in the closest telecom room)

(h) Port blanks as required

.5 A typical 3-gang combination outlet must be arranged as follows:

Gang 1 - Duplex receptacle

Gang 2 - Decora Telecom strap with [3] RJ45 ports

Gang 3 - Decora-style blank insert

.6 A typical flush 3-gang combination outlet must include the following:

(a) [1] 3-gang deep masonry box

(b) [1] 3-gang mud ring

(c) [1] steel partition between Gang 1 and Gang 2

(d) [1] 3-gang (Type 302/304 stainless steel) coverplate with [3] Decora-style openings

(e) [1] heavy-duty industrial grade Decora-style white duplex receptacle

(f) [1] white Decora-style telecom strap with [3] RJ45 ports

(g) [1] white Decora-style blank insert

(h) Up to [3] CAT6 RJ45 telecom jacks (each of which must terminate a horizontal CAT6 telecom cable which originates at a patch panel in the closest telecom room)

(i) Port blanks as required

.7 A typical surface 3-gang combination outlet must include the following:

(a) [1] 3-gang GB Series gang box by Code Electric

(b) [1] steel partition (available from Code Electric for GB Series boxes) between Gang 1 and Gang 2

(c) [1] 3-gang surface cover with curl-over edges and [3] Decora-style openings (available from Code Electric for GB Series boxes)

(d) [1] heavy-duty industrial grade Decora-style white duplex receptacle

(e) [1] white Decora-style telecom strap with [3] RJ45 ports

(f) [1] white Decora-style blank insert

(g) Up to [3] CAT6 RJ45 telecom jacks (each of which must terminate a horizontal CAT6 telecom cable which originates at a patch panel in the closest telecom room)

(h) Port blanks as required

.8 A 4-gang combination outlet with [2] telecom jacks must be provided at each computer workstation and at each location were a network device (such as a printer) is specified.

.9 For each classroom, music room, or resource room, a 4-gang combination outlet with [1] telecom jack must be provided at the teacher's desk and at one other location.

.10 For each multi-purpose room or gymnasium, a 4-gang combination outlet with [1] telecom jack must be provided at each of [4] locations.

.11 For each library:

(a) [1] 4-gang combination outlet with [2] telecom jacks must be provided at the circulation desk;

(b) a 4-gang combination outlet with [2] telecom jacks must be provided at each of [4] additional locations.

These combination outlets must be in addition to any combination outlets required for computer workstations or network devices.

.12 For each staff room, a 4-gang combination outlet with [1] telecom jack must be provided at each of [2] locations.

.13 Final combination outlet quantities and locations must be confirmed by the Infrastructure Manager of the VSB Learning and Information Technology Division during the technical review process.

11 TELECOM OUTLETS FOR WALL PHONES

.1 A single-jack telecom outlet (for a wall phone) must be provided in each teaching space. The outlet must (where practical) be located close to the main entrance to the space.

.2 A typical flush wall phone outlet must include the following:

(a) [1] deep 4X4 box

(b) [1] mud ring (for a 4X4 box) with a single-gang opening

(c) [1] Ortronics OR-403STJ1WP single-gang, stainless steel coverplate with phone mounting studs and [1] RJ45 port

(d) [1] CAT6 RJ45 telecom jack (which must terminate a horizontal CAT6 telecom cable which originates at a patch panel in the closest telecom room)

.3 ~~Vancouver Building By-law Article 3.8.3.21 (Controls) states that a "safety device" must be mounted at an elevation between 400mm and 1200mm above the floor. A telephone which is to be used to summon assistance in an emergency is clearly a "safety device", and as such, must meet the aforementioned accessibility requirement.~~

The centre of each wall phone outlet must be mounted 1200mm above the finished floor.

12 TELECOM OUTLETS FOR WIRELESS ACCESS POINTS

.1 Wireless network coverage must be provided in:

(a) teaching spaces;

(b) resource rooms;

(c) offices;

(d) staff rooms;

(e) work rooms;

(f) multi-purpose rooms;

(g) first aid rooms;

(h) mechanical rooms;

(i) electrical rooms;

(j) cafeterias;

(k) kitchens;

(l) commons and other spaces for gathering and interaction;

(m) gymnasia;

(n) libraries;

(o) performing arts spaces;

(p) other locations where a wireless network connection could be of benefit.

.2 Wireless network coverage is not required in:

(a) washrooms;

(b) storage rooms;

(c) stairways;

(d) exit corridors;

(e) exit vestibules;

(f) narrow corridors not intended for learning or study;

(g) other locations where a wireless network connection would be of no benefit.

.3 Wireless network coverage must be provided in a given space by means of one or more wireless access points. Each wireless access point will be supplied and installed by the VSB Learning and Information Technology Division (or by a contractor working for that division).

Each wireless access point (WAP) will be of the type that receives power over the ethernet connection. 120V power is not required.

The Electrical Drawings must clearly show a telecom outlet at or near the location of each wireless access point.

Each telecom outlet which is to serve a WAP must be equipped with [2] telecom jacks.

~~The Electrical Consultant must specify [1] WAP outlet for each space under 100 square meters in floor area and [2] WAP outlets for each space over 100 square meters in floor area.~~

.4 Where the ceiling height in a given space is 4.5 meters or less, WAP outlets must be mounted on the ceiling.

Where the ceiling height in a given space exceeds 4.5 meters, WAP outlets must be wall mounted between 2750mm AFF and 3660mm AFF.

.5 If a WAP is to be mounted to a GWB wall or ceiling, a telecom outlet must be flush mounted next to the WAP location. A typical flush telecom outlet (intended to serve a WAP) must include the following:

(a) [1] deep 4X4 box

(b) [1] mud ring (for a 4X4 box) with a single-gang opening

(c) [1] single-gang Type 302/304 stainless steel coverplate with [1] Decora-style opening

(d) [1] white Decora-style telecom strap with [3] RJ45 ports

(e) [2] CAT6 RJ45 telecom jacks (each of which must terminate a horizontal CAT6 telecom cable which originates at a patch panel in the closest telecom room)

(f) [1] port blank

.6 If a WAP is to be mounted on the underside of a suspended accessible ceiling, a telecom outlet must be surface mounted on the structural ceiling (in the ceiling space) above the WAP location.

.7 If a WAP is to be mounted on a structural ceiling, a telecom outlet must be surface mounted on the structural ceiling next to the WAP location.

A typical surface telecom outlet (intended to serve a WAP) must include the following:

(a) [1] deep 4X4 surface box

(b) [1] galvanized steel surface coverplate with curl-over edges and [1] Decora-style opening

(c) [1] white Decora-style telecom strap with [3] RJ45 ports

(d) [2] CAT6 RJ45 telecom jacks (each of which must terminate a horizontal CAT6 telecom cable which originates at a patch panel in the closest telecom room)

(e) [1] port blank

.8 During the design phase, the Electrical Consultant (working in concert with the Architect) is responsible for providing a set of clean and uncluttered floor plans (in both PDF and DWG format) to the VSB Project Manager. The floor plans must include room numbers and must show the preliminary location of each WAP outlet. The Electrical Consultant must remind the VSB Project Manager to forward the floor plans to the Infrastructure Manager of the VSB Learning and Information Technology Division for the purpose of facilitating a wireless coverage study.

.9 The wireless coverage study will identify areas where wireless coverage is deficient or absent. The Electrical Consultant is responsible for revising the design to correct coverage problems identified by the study.

13 TELECOM OUTLET FOR INTRUSION CONTROL PANELS

.1 A single-jack telecom outlet must be provided next to the intrusion control panels in the Main Telecom Room.

14 OUTLETS FOR MULTIMEDIA DEVICES

.1 For a new or renovated facility, the VSB will typically provide a number of projectors and install them. (The VSB may provide new projectors and/or projectors from an existing facility.)

.2 It is incumbent on the Architect (in concert with VSB staff) to identify the room and projection wall associated with each projector. The Architect must also obtain (from the VSB) the make and model of each projector.

.3 It is incumbent on the Architect to determine (in concert with VSB staff) the required image size, the associated sight lines, and the size of the display surface for each projector.

.4 The Architect must have access to a comprehensive product manual for each type of projector.

.5 The Architect must determine the mounting configuration (wall or ceiling) for each projector.

.6 Typically, the VSB will install an Apple TV near each projector.

.7 The Architect must pinpoint the location of each projector. The Architect must show the location of the projector and the projector support structure in both plan and elevation on the Architectural Drawings.

~~.8 For each projector to be mounted to a structural ceiling, the Electrical Consultant must specify a 3-gang surface type combination outlet on the structural ceiling near the base of the projector support structure. The outlet must be equipped with [2] telecom jacks (Gang 2), a female USB connector (Gang 3), and a female HDMI connector (Gang 3).~~

~~The female USB connector must terminate a cable which originates at another female USB connector mounted in the closest floor-level (centre at 300mm AFF) combination outlet.~~

~~The female HDMI connector must terminate a cable which originates at another female HDMI connector mounted in the closest floor-level (centre at 300mm AFF) combination outlet.~~

.9 For each projector to be mounted on a GWB stud wall, the Architect must specify appropriate plywood backing.

~~.10 For each projector to be mounted on a wall, the Electrical Consultant must specify a 3-gang combination outlet (flush or surface as applicable) in or on the wall above the base of the projector arm. The outlet must be mounted clear of any cowling or cover surrounding the base of the projector arm. The outlet must be equipped with [2] telecom jacks (Gang 2), a female USB connector (Gang 3), and a female HDMI connector (Gang 3).~~

~~The female USB connector must terminate a cable which originates at another female USB connector mounted in the closest floor-level (centre at 300mm AFF) combination outlet.~~

~~The female HDMI connector must terminate a cable which originates at another female HDMI connector mounted in the closest floor-level (centre at 300mm AFF) combination outlet.~~

15 TELECOM RACEWAY AND CABLE TRAY

.1 Unless noted otherwise in this standard, horizontal telecom cable may be free wired:

(a) ~~in an accessible ceiling space or across an open ceiling, provided that it is tightly bundled, strapped with velcro straps, and hung from 'J' hooks at intervals not exceeding 500mm;~~

(b) within a telecom room on a wall or a rack, provided that it is tightly bundled, strapped with velcro straps, and supported at 300mm intervals.

Where horizontal telecom cable is not installed as described above, it must run within fully enclosed raceway or within a cable tray.

.2 Where multiple cables are run in cable tray or within a telecom room, cables must be bundled together neatly by means of 27mm wide velcro straps. No cable bundle may be more than 50mm in diameter.

.3 Horizontal telecom cable (whether in raceway or not) must not run in wet or damp locations.

Underground locations within a building footprint must be designated as wet locations.

Locations in concrete or masonry which are at or below grade must be designated as wet locations.

.4 Backbone telecom cable may run within raceway in a wet or damp location provided that the cable and raceway are approved for use in wet locations.

.5 Telecom raceway in an ordinary location must be EMT.

.6 Telecom raceway in an underground location must be RPVC conduit.

.7 Telecom raceway within concrete or masonry must be RPVC conduit.

.8 Telecom raceway in a wet location which is not underground or within concrete or masonry, must be EMT with wet location couplings and connectors.

.9 In a location where telecom cables would be subject to mechanical damage without significant protection, the cables must be installed in rigid metal conduit.

.10 Telecom cable tray must be of the steel wire mesh welded basket type with an electrogalvanized zinc finish.

.11 Minimum cable tray dimensions: 100mm High X 450mm Wide

.12 A minimum clearance of 300mm must exist above telecom cable tray.

.13 A minimum clearance of 150mm must exist below telecom cable tray.

.14 Acceptable Products - Telecom Cable Tray

(a) Cooper B-Line Flextray steel wire basket cable tray

(b) ExpressTray steel wire basket cable tray

(c) MonoSystems Mono-Mesh wire basket cable tray

.15 Telecom raceway must not be smaller than 27mm.

.16 There must be no more than 180 degrees of bending between any two consecutive pull points in a telecom raceway system.

.17 There must be no more than 30 meters of raceway between any two consecutive pull points in a telecom raceway system.

.18 Each telecom raceway pull box must be configured to permit straight pulls only.

.19 Unless noted otherwise in this standard, telecom raceway must be concealed.

.20 Telecom raceway may be exposed in a service space or on an open ceiling.

.21 Telecom cable tray (or a fully enclosed raceway system) must be provided above accessible dropped ceilings and below open ceilings in all principal corridors.

.22 In the Main Telecom Room, telecom cable tray must be arranged in a "figure 8" such that it runs around the perimeter of the room and directly over the telecom racks.

.23 Each telecom outlet box must be at least [2] gangs wide. Single gang box covers may be used on 2-gang or 4X4 boxes.

,24 Each telecom compartment in a partitioned outlet box must be at least [2] gangs wide.

.25 For each telecom outlet, 27mm EMT must be provided from the outlet box to the closest:

(a) accessible ceiling space; or

(b) telecom cable tray; or

(c) telecom pull box; or

(d) telecom room.

.26 For each combination outlet, 27mm EMT must be provided from the telecom compartment of the outlet box to the closest:

(a) accessible ceiling space; or

(b) telecom cable tray; or

(c) telecom pull box; or

(d) telecom room.

~~.27 For each auxiliary telecom room, [2] spare 53mm telecom raceways must be provided from that room to the Main Telecom Room.~~

16 SEISMIC RESTRAINT

.1 Refer to the subsection entitled "Seismic Restraint" in Section 01 00 50 "General Electrical Requirements".

17 TELECOM BONDING

.1 Refer to Section 26 05 26 "Grounding and Bonding".

18 GOOSENECK ROOF STACK SYSTEM

.1 Refer to the subsection entitled "Gooseneck Roof Stacks for Future Wiring" in Section 01 00 50 "General Electrical Requirements".

19 IDENTIFICATION

.1 Plastic tape labels must be used for the identification of telecom cabling infrastructure.

.2 Plastic tape labels must be produced with a Brady HandiMark, Brother P-Touch, or a similar professional labelling machine. Each plastic tape label must be waterproof.

.3 Plastic labelling tape must be white. Lettering must be black and uppercase.

.4 Lettering for cable labels, coverplate labels, box labels, and patch panel port labels must be 3mm high.

.5 Cable labels must be of the self-laminating wrap-around type.

.6 Lettering for rack and cabinet labels must be 6mm high.

.7 A telecom room identifier must be assigned to each telecom room. This identifier must be of the form 'TRX' where 'TR' stands for 'Telecom Room' and 'X' is the room number (assigned by the Architect).

Example: Telecom room identifier 'TR142' identifies 'Telecom Room 142'.

.8 A rack identifier must be assigned to each rack in each telecom room. This identifier must be of the form 'RX' where 'R' stands for 'Rack' and 'X' is the rack number.

Example: Rack identifier 'R1' identifies 'Rack 1'.

.9 An identifier must be assigned to each horizontal telecom cable. For each horizontal telecom cable which does not terminate at an outlet serving a wireless access point (WAP), the identifier must be of the form 'X1-X2' where 'X1' is the number of the space where the user end of the cable terminates, and 'X2' is a capital letter which uniquely identifies the cable within the space.

Example: Cable identifier '223-B' identifies 'Cable B' in Space '223'.

For each horizontal telecom cable which terminates at a WAP outlet, the prefix 'X' must be added to the cable identifier.

Example: Cable identifier 'X223-B' identifies 'Cable B' terminating at a WAP outlet in space '223'.

When more than one cable terminates at a single user outlet, cable letters must be assigned from left to right and top to bottom.

.10 For each horizontal telecom cable, a plastic tape label must be:

(a) attached to each end of the cable;

(b) mounted on the coverplate next to the port at the user outlet;

(c) mounted to the inside of the outlet box.

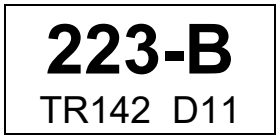
Each label must include three identifiers:

(a) the cable identifier;

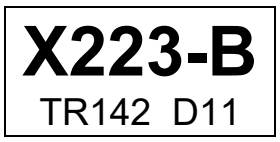
(b) the telecom room identifier;

(c) the patch panel port identifier.

Example of a label for a horizontal cable serving a general user outlet:



Example of a label for a horizontal cable serving a WAP outlet:



.11 Each patch panel must be assigned an identifier which uniquely identifies the patch panel within the associated telecom room. Each patch panel identifier must take the form of a capital letter. For each rack, patch panels must be identified in sequence from the top of the rack to the bottom.

A plastic tape label with the text 'PATCH PANEL X' (where 'X' is the patch panel identifier) must be attached to each patch panel.

.12 Each patch panel port is identified with a number by the manufacturer. The number must not be hidden or obscured.

.13 Each (in-service) patch panel port must be labelled. The patch panel port label must include the cable identifier and a descriptor for the type of room where the user end of the cable terminates.

Example of a patch panel port label for a horizontal cable serving a general user outlet:

223-B
Office

Example of a patch panel port label for a horizontal cable serving a user outlet for a wireless access point:

X223-B
Office

.14 For each backbone telecom cable, a plastic tape label must be attached to the cable jacket at each end of the cable.

.15 For each inter-building backbone cable, the label on each end must bear an identifier of the format '[X1-X2/X3-X4]-X5.X6' where:

'X1' is the number of the building in which the cable originates;
'X2' is the number of the telecom room in which the cable originates;
'X3' is the number of the building in which the cable terminates;
'X4' is the number of the telecom room in which the cable terminates;
'X5' is a letter identifying the cable type ('F' for fiber / 'U' for UTP);
'X6' is the number of fibers or pairs.

Example of an inter-building cable label:

[BLDG1-TR1/BLDG2-TR3]-F.12

.16 For each intra-building backbone cable, the label on each end must bear an identifier of the format '[X2/X4]-X5.X6' where:

'X2' is the number of the telecom room in which the cable originates;
'X4' is the number of the telecom room in which the cable terminates;
'X5' is a letter identifying the cable type ('F' for fiber / 'U' for UTP);
'X6' is the number of fibers or pairs.

Example of an intra-building cable label:

[TR1/TR3]-F.12

.17 A Horizontal Cable Identification Table must be produced. For each horizontal cable, the table must list the cable identifier, the associated patch panel port, and

the cable length. The table must include cable identifier logic to make it possible for the user to understand the horizontal cable identification system. The Horizontal Cable Identification Table must be included in the telecom cabling section of the Electrical Operations and Maintenance Manual.

.18 A Backbone Cable Identification Table must be produced. For each backbone cable, the table must list the cable identifier and the cable length. The table must include cable identifier logic to make it possible for the user to understand the backbone cable identification system. Include the Backbone Cable Identification Table in the telecom cabling section of the Electrical Operations and Maintenance Manual.

.19 The Telecom Cabling Foreman must meet on site with the Electrical Consultant to review telecom cabling identification requirements prior to the start of the telecom cabling work.

20 TESTING

.1 Each Category 6 cable assembly must be tested with a Level II tester to ensure compliance with TIA-568-C.2.

.2 Each fiber optic cable assembly must pass the Tier 1 and Tier 2 tests specified in TIA-568-C.3.

.3 Summarized test results must form part of each hardcopy Electrical Operation and Maintenance Manual.

.4 Complete test results must be part of each PDF copy of the Electrical Operation and Maintenance Manual.

21 TELECOM CABLING OPERATION AND MAINTENANCE DOCUMENTATION

.1 Refer to the subsection entitled "Electrical Operations and Maintenance Manual" in Section 01 00 50 "General Electrical Requirements".

22 WARRANTIES

.1 A warranty must be provided by the Telecom Cabling Contractor which covers the work performed by the Telecom Cabling Contractor for a period of one year following notice of substantial completion.

During the one-year warranty period, all problems must be fully rectified at no cost to the Owner.

Problems include:

(a) poor or marginal workmanship;

(b) poor or marginal equipment condition;

(c) poor or marginal equipment or system performance;

(d) lack of conformance with applicable codes and standards.

.2 CAT6 and fiber cabling infrastructure must carry CommScope material and performance warranties.

23 DEMONSTRATION AND TRAINING

.1 Refer to the subsection entitled "Demonstration and Training Requirements" in Section 01 00 50 "General Electrical Requirements".

SECTION 27 50 00
AUDIO SYSTEM

1 GENERAL

.1 Each new audio system must incorporate a Valcom "Class Connection" paging system.

.2 The Audio System Contractor must be approved by Valcom to supply and install the Valcom "Class Connection" paging system.

.3 The Audio System Contractor is responsible for the detailed design of the audio system.

.4 Each new audio system must include:

(a) a main rack assembly;

(b) [1] or more administrative telephones;

(c) Type 1 and Type 2 audio input stations;

(d) corded microphones;

(e) speakers;

(f) clocks;

(g) wiring and raceway.

.5 An audio zone must be established for:

(a) each teaching space;

(b) each resource room;

(c) each office area;

(d) each staff room;

(e) each work room;

(f) each multi-purpose room;

(g) each first aid room;

(h) each cafeteria;

(i) each kitchen;

(j) each gymnasium;

(k) each library;

(l) each performing arts space;

(m) the common areas and washrooms on each floor;

(n) exterior areas.

.6 The paging system must be interfaced to the facility VoIP system.

.7 The paging system must facilitate general paging to any zone or combination of zones from an administrative telephone or from any VoIP telephone.

.8 The paging system must facilitate an emergency all-page from an administrative telephone or from any VoIP telephone. The emergency all-page must override all central and local sources.

.9 The paging system must include an integrated electronic program clock and tone generator such that program tones can be distributed throughout the school on a specific schedule. The program system must be configured in accordance with the requirements of the school staff.

.10 The paging system must control clocks throughout the school.

2 MAIN RACK ASSEMBLY

.1 The Main Rack Assembly must include:

(a) [1] Middle Atlantic DWR Series pivoting wall mount audio rack complete with rack shelves and accessories as required;

(b) [1] Valcom Class Connection Application Server (latest version);

(c) Valcom Class Connection Audio Gateways as required;

(d) [1] Valcom Class Connection Telephone System Interface;

(e) Valcom power supplies as required.

(f) network switches as required;

(g) patch panels as required (one for each switch);

(h) [1] DSP mixer-amplifier for each space where audio input stations have been installed;

(i) [1] Eaton Powerware 9PX1500RTN 1500VA rackmount UPS unit;

(j) [1] Eaton EHBPL1500R-PDU1U rackmount UPS bypass unit;

(k) blank filler plates to cover all unused openings;

(l) all other infrastructure required to satisfy the functional requirements for the main rack.

.2 During a power failure, the UPS unit must power the audio system so that emergency announcements can be made as required.

3 VALCOM ADMINISTRATIVE TELEPHONE

.1 A Valcom administrative telephone must be provided on a desktop in the Main Administration Office. (An administrative telephone may be provided at one ~~or~~ more additional location~~s~~ as determined by the VSB Project Manager.)

4 TYPE 1 AUDIO INPUT STATIONS

.1 A Type 1 audio input station must be provided near each administrative telephone.

.2 The Type 1 audio input station will facilitate connection of the administrative telephone to the paging system by means of an RJ45 telecom jack.

.3 The Type 1 audio input station will facilitate connection of a smart device to the paging system (for music distribution) by means of a 3.5mm jack.

.4 Each Type 1 audio input station must include:

(a) [1] 2-gang box (flush or surface type as required);

(b) [1] 2-gang mud ring (if the station is flush mounted in a GWB stud wall);

(c) [1] white Decora-style telecom strap with [3] RJ45 ports (GANG 1);

(d) [1] CAT6 RJ45 telecom jack which must terminate a horizontal CAT6 telecom cable which originates at a patch panel in the Main Audio Rack (mounted in Port 1 of the telecom strap);

(e) [2] port blanks;

(f) [1] Valcom V-9130-W Remote Input Module with 3.5mm jack (GANG 2)(wired back to BIX block in Main Audio Rack);

(g) [1] 2-gang coverplate (flush or surface type as required) with [2] Decora-style openings.

Each flush type coverplate must be Type 302/304 stainless steel. Each surface type coverplate must be galvanized steel with curl-over edges.

5 TYPE 2 AUDIO INPUT STATIONS

.1 A Type 2 audio input station must be installed at four locations in each gym, and at two locations in each multi-purpose room. Type 2 audio input stations may be required in additional spaces as determined by the VSB Project Manager.

.2 For each space where Type 2 audio input stations are installed, a DSP mixer-amplifier (dedicated to that space) must be provided in the Main Audio Rack.

.3 Each Type 2 audio input station in a given space must be connected to the DSP mixer-amplifier (dedicated to that space) by means of a dedicated CAT6 UTP cable which conforms to the horizontal cable specifications in Section 27 10 00 (Telecom Cabling).

.4 Each Type 2 audio input station in a given space will facilitate the connection of local sources and/or a microphone to the DSP mixer-amplifier dedicated to that space. The DSP mixer-amplifier, located in the Main Audio Rack, will drive the speakers in the space. The DSP mixer-amplifier must also incorporate an input from the paging system.

.5 Each Type 2 audio input station must be flush mounted in a wall such that the centre of the input station is 300mm above the finished floor.

.6 Each Type 2 audio input station must include:

(a) [1] XLR 1/4" jack;

(b) [1] 3.5mm jack;

(c) [1] pair of RCA jacks;

(d) [1] master volume control;

(e) [1] hinged and locking stainless steel cover.

.7 Acceptable Product - Type 2 Audio Input Station

(a) Factor V-RVC-PRO In-wall Microphone/Line Pre-amplifier

6 CORDED MICROPHONES

.1 A Shure SM58 corded microphone must be provided for each space where Type 2 audio input stations are installed.

7 SPEAKER ASSEMBLIES

.1 Acceptable Product - Speaker assembly for Gym

(a) Sound Tube HP890i

.2 Acceptable Product - Speaker assembly for Multi-Purpose Room

(a) Community CS8 or approved equivalent

.3 Acceptable Products - Flush mount ceiling speaker assembly for common areas, resource rooms, office areas, staff rooms, work rooms, first aid rooms, cafeterias, kitchens, libraries, and washrooms

(a) Valcom V-1020C with Valcom V-9915M back box (add V-9914M speaker bridge for Tbar ceilings)

.4 Acceptable Products - Flush mount ceiling speaker assembly for teaching spaces

(a) Valcom VE4060A with Valcom V-9915M back box (Add V-9914M speaker bridge for Tbar ceilings.)

.5 Acceptable Products - Surface mount ceiling speaker assembly for common areas, resource rooms, office areas, staff rooms, work rooms, first aid rooms, cafeterias, kitchens, libraries, and washrooms

(a) Valcom V-1920C with Valcom V-1991 back box

.6 Acceptable Products - Surface mount ceiling speaker assembly for teaching spaces

(a) Valcom VE4028A with Valcom VB-S11 back box

.7 Acceptable Products - Speaker assembly for recessed mounting in an exterior overhang

(a) Valcom V-1080 Flexhorn with recessed mount enclosure

.8 Acceptable Products - Speaker assembly for surface mounting on an exterior wall or under an overhang

(a) Valcom V-1080 Flexhorn with weatherproof surface mount enclosure

8 CABLING FOR VALCOM SPEAKERS

.1 Each speaker cable for a Valcom IP speaker or for a Valcom analog speaker must be CAT6 UTP and must conform to the horizontal cable specifications in Section 27 10 00 (Telecom Cabling).

.2 Each IP speaker cable must originate at a patch panel in the Main Rack Assembly.

.3 Each analog speaker cable must originate on a BIX block within an enclosed box mounted to the inside surface of the back panel of the Main Rack Assembly.

9 CLOCKS

.1 Each clock must be integrated with the audio system.

.2 Each clock must be manufactured by Valcom.

.3 A clock must be provided in each:

(a) teaching space;

(b) gymnasium;

(c) library;

(d) auditorium;

(e) resource room;

(f) staff room;

(g) lunch room;

(h) cafeteria;

(i) boiler room.

.4 A wire guard must be provided for each clock mounted at a location where an unprotected clock would be subject to damage.

10 AUDIO SYSTEM RACEWAY

.1 Unless noted otherwise in this standard, all audio cables must be installed in raceway.

.2 Audio cable may exposed:

(a) at an audio rack;

(b) at a suspended speaker;

(c) at a speaker that is mounted on an arm.

.3 Unless noted otherwise in this standard, all audio cables in an ordinary location must be installed in EMT.

.4 All audio cables in an underground location or in concrete or masonry must be installed in RPVC conduit.

.5 Audio cables in a damp or wet location must be approved for use in wet locations.

.6 Unless noted otherwise in this standard, all audio cables in a damp or wet location (not underground or in concrete or masonry) must be installed in EMT with wet location couplings and connectors.

.7 All audio cables in a hazardous location must be installed in rigid metal conduit.

.8 In a location where audio cables would be subject to mechanical damage without significant protection, the cables must be installed in rigid metal conduit.

.9 Underground locations within the building footprint must be designated as wet locations.

.10 Locations in concrete or masonry that are below grade must be designated as wet locations.

.11 Each pull box in a raceway system designated for audio cables must be configured to permit straight pulls only.

.12 Each raceway system for audio cables must be constructed such that there is no more than the equivalent of two 90 degree bends between any two consecutive pull-points.

.13 Each raceway system for audio cables must be constructed such that there is no more than 30 meters of pulling distance between any two consecutive pull points.

.14 Unless noted otherwise in this standard, audio raceway must be concealed.

.15 Audio raceway may be exposed in a service space or on an open ceiling.

.16 Where a speaker assembly is mounted in a tbar ceiling, 21mm liquid tight flexible metal conduit must be provided between the speaker backbox and an audio pull box on (or supported from) the structural ceiling.

11 IDENTIFICATION

.1 Refer to the subsection entitled "Identification" in Section 01 00 50 "General Electrical Requirements".

12 AUDIO SYSTEM COMMISSIONING REPORT

.1 At substantial completion, an Audio System Commissioning Report must be produced.

.2 The Audio System Commissioning Report must list each interior space which contains one or more audio speakers. For each interior space listed, the commissioning report must document that the quality (volume and intelligibility) of the audio system sound within the space is acceptable.

.3 The commissioning report must list each relevant exterior area. For each exterior area listed, the commissioning report must document that the volume of the class change tone is acceptable.

13 AUDIO SYSTEM DOCUMENTATION

.1 Audio system documentation must be placed in the Electrical Operation and Maintenance Manual ~~as described in the subsection entitled "Electrical Operations and Maintenance Manual" in Section 01 00 50 "General Electrical Requirements"~~.

14 DEMONSTRATION AND TRAINING

.1 Refer to the subsection entitled "Demonstration and Training Requirements" in Section 01 00 50 "General Electrical Requirements".

SECTION 28 16 00
INTRUSION DETECTION

1 REFERENCE DRAWING

.1 Refer to Drawing E101A (Arrangement of Intrusion Control Enclosures and Associated Raceway) at the end of this standard.

2 GENERAL

~~.1 During the design phase, the Electrical Consultant must request that the VSB Project Manager arrange a meeting between the Electrical Consultant, the VSB Electrical Supervisor, and the VSB Operations Supervisor for the purpose of establishing electrical requirements associated with the intrusion detection system.~~

.2 The Electrical Consultant must integrate electrical requirements related to the intrusion system into the electrical design.

.3 The Electrical Contractor must provide the following:

(a) [2] control panel enclosures

(b) wiring

(c) raceway

(d) raceway bonding infrastructure

(e) seismic infrastructure related to the intrusion raceway

.4 VSB staff will provide the following:

(a) intrusion control panel electronics

(b) intrusion sensors

(c) keypads

(d) programming

(e) system commissioning

.5 The intrusion detection system will be of the "silent alarm" type. (No annunciators are required).

.6 In general, the detection of intruders will be accomplished solely with intrusion sensors which utilize infrared, ultrasonic, and/or microwave technology. No glass break sensors will be utilized. Door contacts will only be utilized where specified by VSB Operations.

.7 The Electrical Contractor must provide a complete and functional, totally enclosed raceway system for intrusion wiring. The raceway system must include all necessary conduit, tubing, duct, wireway, fittings, fasteners, clamps, adapters, device boxes, pull boxes, control panel enclosures, supports, hangers, bonding conductors, bonding connectors, and pull cords.

The raceway system must provide a fully enclosed pathway from each intrusion sensor device box to the main intrusion pull box.

The raceway system must provide a fully enclosed pathway from each keypad device box to the main intrusion pull box.

.8 A 1-gang device box must be provided for each keypad. The location of each keypad box will be identified by VSB Operations.

.9 A 1-gang device box must be provided for each intrusion sensor. Intrusion sensors must be located as described below.

.10 For each building, each exterior entry point must be covered by an intrusion sensor. (One intrusion sensor can cover more than one entry point.) Exterior entry points include:

(a) exterior doors;

(b) windows which are close to grade level or can easily be accessed from grade level;

(c) other exterior openings which are close to grade level or can easily be accessed from grade level;

(d) roof hatches or other roof openings where roof access can be gained by means of a ladder or by climbing.

.11 For each building, each main corridor on each floor must be covered by intrusion sensors. This coverage is required in order to detect individuals who may enter the building during operating hours and then hide in a concealed location to avoid detection at closing time.

.12 Intrusion system raceway must not be smaller than 21mm.

.13 Intrusion raceway fill must not exceed 30%.

.14 Any intrusion pull box must not be smaller than 200mm W x 200mm L x 100mm H.

.15 Intrusion cables in an ordinary location must be installed in EMT.

.16 Intrusion cables in a damp or wet location must be approved for use in wet locations.

.17 Underground locations within the building footprint must be designated as wet locations.

.18 Locations within below-grade concrete or masonry must be designated as wet locations.

.19 Intrusion cables in concrete or masonry must be installed in RPVC conduit.

.20 Intrusion cables in an underground location must be installed in RPVC conduit.

.21 Intrusion cables in a damp or wet location (not underground or in concrete or masonry) must be installed in EMT with wet location couplings and connectors.

.22 Intrusion cables in a hazardous location must be installed in rigid metal conduit.

.23 In a location where intrusion cables would be subject to mechanical damage without significant protection, the cables must be installed in rigid metal conduit.

.24 Each pull box in a raceway system designated for intrusion cables must be configured to permit straight pulls only.

.25 Each raceway system for intrusion cables must be constructed such that there is no more than the equivalent of two 90 degree bends between any two consecutive pull-points.

.26 Each raceway system for intrusion cables must be constructed such that there is no more than 30 meters of pulling distance between any two consecutive pull points.

.27 Unless noted otherwise in this standard, intrusion raceway must be concealed.

.28 Intrusion raceway may be exposed in a service space or on an open ceiling.

.29 For each keypad device box and intrusion sensor device box, the Electrical Contractor must provide [1] 4C#22 'Z' station cable from the device box to the main intrusion pullbox.

For each intrusion cable, 300mm of slack must be available at the device box to facilitate connection to the device.

For each intrusion cable, [1] meter of slack must be available at the main intrusion pullbox to facilitate the routing of the cable through the pull box (by VSB staff) to one of the intrusion control panel enclosures below the pull box. (Refer to the Reference Drawing.)

.30 Each keypad box must be installed such that the centre of the box is at 1524mm AFF.

.31 A dedicated 1P2W, 120V, 15A power circuit must be provided for the intrusion control panels. A 4X4 box must be installed next to the location specified for the intrusion control panels. The box must be galvanized steel with a galvanized steel, surface-type cover. The box must be surface mounted. 21mm raceway must be provided between the box and the closest branch circuit panelboard. [3] 1C#12 RW90 CU conductors (black hot, white neutral, green bond) must run from the panelboard to the box. The conductors at the box must be capped and taped. The conductors at the box must be coiled up and pushed into the box. The box cover must be installed and a label must be placed on the cover which

reads "Intrusion Panel Power Circuit". Conductors must be terminated as required at the panelboard and the breaker taped off. VSB staff will make the final power connection between the box and the intrusion electronics package.

3 PRODUCTS

.1 Acceptable Product - Intrusion Control Panel Enclosure

(a) Bel K201608

4 IDENTIFICATION

.1 Refer to the subsection entitled "Identification" in Section 01 00 50 "General Electrical Requirements".

SECTION 28 31 00
FIRE DETECTION AND ALARM

1 GENERAL

.1 Standards

(a) CAN/ULC-S524 "Standard for the Installation of Fire Alarm Systems"

(b) CAN/ULC-S525 "Audible Signal Devices for Fire Alarm Systems"

(c) CAN/ULC-S526 "Visible Signal Devices for Fire Alarm Systems"

(d) CAN/ULC-S528 "Manual Stations for Fire Alarm Systems"

(e) CAN/ULC-S529 "Smoke Detectors for Fire Alarm Systems"

(f) CAN/ULC-S530 "Heat Actuated Fire Detectors for Fire Alarm Systems"

(g) CAN/ULC-S537 "Verification of Fire Alarm Systems"

(h) CAN/ULC-S527 "Standard for Control Units for Fire Alarm Systems"

(i) CAN/ULC-S533 "Standard for Egress Door Securing and Releasing Devices"

(j) CAN/ULC-S561 "Installation and Services for Fire Signal Receiving Centres and Systems"

(k) CSA-C22.2 No. 208 "Fire Alarm and Signal Cable"

.2 Codes

(a) Vancouver Building By-law Subsection 3.2.4 "Fire Alarm and Detection Systems"

(b) BC Electrical Code Section 32 "Fire alarm systems, fire pumps, and carbon monoxide alarms"

.3 A single-stage fire alarm system must be provided for each new VSB facility.

.4 The Electrical Drawings must include:

(a) a schedule of fire alarm devices and equipment;

(b) a fire alarm connection diagram showing all devices, equipment, and wiring;

(c) a functional description of the fire alarm system;

(d) a schedule of annunciator zones;

(e) a layout for each graphic annunciator;

(f) floor plans which show the location of fire alarm devices and equipment.

.5 Where a new fire alarm system is verified in phases, the final verification must include a complete verification of the entire fire alarm system.

.6 Where fire alarm work is undertaken to modify an existing fire alarm system, the final verification must include a complete verification of the entire fire alarm system.

2 FUNCTIONAL DESCRIPTION

.1 Each new fire alarm system must include:

(a) a fire alarm control panel;

(b) a fire alarm graphic annunciator;

(c) fault isolators;

(d) pull stations;

(e) smoke detectors;

(f) heat detectors;

(g) addressable monitor modules (to monitor sprinkler flow switches, sprinkler valve handle switches, sprinkler dry valve pressure switches, dry system compressor pressure switches, heat trace controller trouble contacts, and other devices);

(h) addressable relay modules (to release door hold-open devices, shut down mechanical units, start smoke control systems, and initiate other actions);

(i) door hold-open devices;

(j) bells;

(k) strobes;

(l) end-of-line devices.

.2 When a pull station, smoke detector, heat detector, or sprinkler flow switch activates:

(a) each bell must sound;

(b) each strobe must flash;

(c) each door hold-open device must release;

(d) each mechanical unit equipped with a duct smoke detector must shut down;

(e) the fire alarm control panel must send a signal to the autodialer which will cause the autodialer to alert the monitoring station that an alarm condition is in progress;

(f) the general alarm LED indicator on the fire alarm control panel must illuminate;

(g) other LED indicators on the fire alarm control panel which identify activated devices must illuminate;

(h) a description of the alarm condition and the identity of each activated device must appear on the fire alarm control panel LCD display;

(i) the general alarm LED indicator on the graphic annunciator must illuminate;

(j) other LED indicators on the graphic annunciator which identify activated devices must illuminate;

(k) a description of the alarm condition and the identity of each activated device must appear on the graphic annunciator LCD display.

.3 When a valve handle switch, heat trace controller trouble contact, or other supervised device activates:

(a) the fire alarm control panel must send a signal to the autodialer which will cause the autodialer to alert the monitoring station that a supervisory event has occurred;

(b) the general supervisory LED indicator on the fire alarm control panel must illuminate;

(c) other LED indicators on the fire alarm control panel which identify the specific supervisory event must illuminate;

(d) a description of the supervisory event and the identity of each activated device must appear on the fire alarm control panel LCD display;

(e) an audible alarm must sound at the fire alarm control panel;

(f) the general supervisory LED indicator on the graphic annunciator must illuminate;

(g) other LED indicators on the graphic annunciator which identify the specific supervisory event must illuminate;

(h) a description of the supervisory event and the identity of each activated device must appear on the graphic annunciator LCD display;

(i) an audible alarm must sound at the graphic annunciator.

.4 When the fire alarm system enters a general trouble condition:

(a) the fire alarm control panel must send a signal to the autodialer which will cause the autodialer to alert the monitoring station that a general trouble condition has occurred;

(b) the general trouble LED indicator on the fire alarm control panel must illuminate;

(c) a description of the trouble condition must appear on the fire alarm control panel LCD display;

(d) an audible trouble alarm must sound at the fire alarm control panel;

(e) the general trouble LED indicator on the graphic annunciator must illuminate;

(f) a description of the trouble condition must appear on the graphic annunciator LCD display;

(g) an audible trouble alarm must sound at the graphic annunciator.

3 PRODUCTS

.1 FIRE ALARM CONTROL PANEL

The fire alarm control panel must be located in the Main Telecom Room or in the Main Electrical Room.

Each fire alarm control panel in an elementary school must be a Notifier NFS2-640 Intelligent Fire Alarm Control Panel. Each Notifier NFS2-640 Control Panel must be equipped with [2] signalling line circuits (SLCs). Devices must be distributed evenly between the two signalling line circuits.

Each fire alarm control panel in a secondary school must be a Notifier NFS2-3030 Intelligent Fire Alarm Control Panel. Each Notifier NFS2-3030 Control Panel must be equipped with a minimum of [2] signalling line circuits and a maximum of [10] signalling line circuits. Devices must be distributed evenly between the signalling line circuits.

When the system is operating normally, the liquid crystal display must display the words "SYSTEM NORMAL", as well as the time and date, over a green background.

The fire alarm control panel must include an LED indicator for each of the following conditions:

(a) ALARM

(b) SUPERVISORY

(c) SYSTEM TROUBLE

(d) SIGNAL SILENCED

The fire alarm control panel must include the following push buttons:

(a) ACKNOWLEDGE

(b) SIGNAL SILENCE

(c) RESET

(d) DRILL

(e) LAMP TEST

The fire alarm control panel must also include push buttons and LED indicators required to provide "point disable" functionality.

.2 GRAPHIC ANNUNCIATOR

A graphic annunciator must be provided. The graphic annunciator must be located at the fire entrance. The location of the graphic annunciator must be approved by the Vancouver Fire Department.

The graphic annunciator must include a Notifier CAB-4 Series cabinet of the appropriate size. The cabinet must include a key-lockable front door with a full-length vandal-resistant window. The cabinet must include all other required accessories.

The graphic annunciator must include a custom graphic display. The custom graphic display must include a title at the top left. The first line of the title must read: "FIRE ALARM GRAPHIC ANNUNCIATOR" The second line of the title must be the name of the school. The custom graphic display must include a north arrow at the top right.

The graphic annunciator must included a Notifier LCD2-80 annunciator unit (which includes a liquid crystal display, LED indicators, and push buttons). The LCD2-80 must be flush mounted in the substrate of the custom graphic display.

When the system is operating normally, the liquid crystal display must display the words "SYSTEM NORMAL", as well as the time and date, over a green background.

The LCD2-80 must include an LED indicator for each of the following conditions:

(a) ALARM

(b) SUPERVISORY

(c) SYSTEM TROUBLE

(d) SIGNAL SILENCED

The LCD2-80 must include the following push buttons:

(a) ACKNOWLEDGE

(b) SIGNAL SILENCE

(c) RESET

(d) DRILL

(e) LAMP TEST

The custom graphic display must include a complete set of floor plans (and a roof plan if necessary). Colours must be used to segregate general floor areas, exit stair shafts, and elevator shafts.

The custom graphic display must clearly show the location of a person standing in front of the graphic annunciator (by means of a "YOU ARE HERE" arrow).

The custom graphic display must show the location of the fire alarm control panel.

The custom graphic display must show the location of the main sprinkler tree.

The custom graphic display must include LED indicators. Each LED indicator which indicates an alarm condition must be red. Each LED indicator which indicates a supervisory or general trouble condition must be yellow.

A line of LED indicators is to be placed next to each floor plan. The name and function of each LED (in a typical line) is described below:

(a) The first LED indicator must illuminate if one or more of the pull stations activate in the represented area. This LED indicator is to be labelled "PULL STATIONS - [FLOOR DESCRIPTION]".

(b) The second LED indicator must illuminate if one or more of the smoke detectors activate in the represented area. This LED indicator is to be labelled "SMOKE DETECTORS - [FLOOR DESCRIPTION]".

(c) The third LED indicator must illuminate if there is a sprinkler flow condition initiates within the represented area. This LED indicator is to be labelled "SPRINKLER FLOW - [FLOOR DESCRIPTION]".

(d) The fourth LED indicator must illuminate if a supervisory condition initiates within the represented area. This LED indicator is to be labelled "SUPERVISORY - [FLOOR DESCRIPTION]".

(e) Additional dedicated LED indicators must be provided. Each dedicated LED indicator must match up with a single device in the represented area. There must be a dedicated LED indicator for each duct smoke detector, each smoke detector in a stair shaft, each smoke detector in an elevator shaft, and each heat detector in an elevator shaft.

A leader must connect each of these LED indicators with a dot placed on the floor plan at the location of the associated device.

Acceptable manufacturers - Fire Alarm Graphic Annunciators

(a) Matrix Design Graphics Ltd

(b) ADS Inc

.3 FAULT ISOLATORS

In general, each fault isolator must be located inside the fire alarm control panel on a Notifier ISO-6A card.

Where the Code requires a fault isolator to be located in the field, the Notifier ISO-XA Fault Isolator Module must be used.

With the express written permission of the VSB Electrical Supervisor, the Notifier ISO-XA Fault Isolator Module may be located in a service room which is remote from the service room which contains the fire alarm control panel.

Each signalling line circuit (SLC) which originates at a fire alarm control panel must daisy chain across an appropriate number of internal isolator inputs. A separate isolated SLC branch is thereby created at the output of each internal isolator.

Each isolated SLC branch can support a maximum number of devices as specified by the manufacturer. Place no more than 80% of the maximum number of devices on a given branch.

Each floor must be served by a separate isolated SLC branch.

Where there are fire alarm devices on the roof, the roof must be served by a separate isolated SLC branch.

Each exit stair must be served by a separate isolated SLC branch.

Each elevator shaft must be served by a separate isolated SLC branch.

Each fire compartment (not previously listed) with a rating of 2 hours or more must be served by a separate isolated SLC branch.

.4 PULL STATIONS

A pull station must be provided at each exit door in a floor area. An exit door can be a door which leads from a floor area directly to the exterior, or it can be a door which leads from a floor area into an exit stair or exit corridor. Note that each exit stair or exit corridor is fire separated from the rest of the building and is therefore not part of any floor area. Pull stations must not be placed within exit stairs or exit corridors.

Each pull station (not specified for outdoor use) must be an Edwards 270-SPO pull station complete with glass rod. This is a non-addressable device. A Notifier FMM-101A mini monitor module (with end-of-line resistor) must be placed in the box behind the pull station in order to interface the pull station to the addressable system. This arrangement facilitates the inexpensive replacement of pull stations by VSB maintenance staff. Fully addressable pull stations are not permitted.

Each pull station specified for outdoor use must be an Edwards MPSR1-S45W-GE pull station. This is a non-addressable device. A Notifier FMM-101A mini monitor module (with end-of-line resistor) must be placed in the box behind the pull station in order to interface the pull station to the addressable system. This arrangement facilitates the inexpensive replacement of pull stations by VSB maintenance staff. Fully addressable pull stations are not permitted.

.5 SMOKE DETECTORS

A smoke detector must be provided:

(a) at the top of each exit stair shaft;

(b) at every third (floor level) landing in an exit stair shaft;

(c) at the top of the each elevator shaft;

(d) in each electrical room;

(e) in each telecom room;

(f) on each side of a door which is equipped with one or more hold-open devices;

(g) in each elevator machine room;

(h) at each elevator landing;

(i) as part of a duct smoke detector system, at the beginning of the supply duct in each unit which supplies air to more than one fire compartment;

(j) as part of a duct smoke detector system, at the beginning of the supply duct in each unit which supplies air to all or part of a single fire compartment where the size of any fan within the unit is 2 horsepower or larger;

(k) at the entrance to a covered walkway connecting two buildings;

(l) in a vestibule constructed between two buildings to limit smoke movement.

Multiple smoke detectors must be provided:

(a) along the perimeter of a draft stop system;

(b) in the vicinity of a smoke curtain system.

Each non-duct type smoke detector must be a Notifier FSP-851A photoelectric smoke detector. Each detector must be provided with a B210LP(A) base.

Each duct-type smoke detector assembly must include:

(a) [1] Notifier DNRA Intelligent non-relay photoelectric low flow smoke detector housing;

(b) [1] Notifier FSP-851A photoelectric smoke detector.

.6 HEAT DETECTORS

A heat detector must be placed at the bottom of each elevator shaft.

Each heat detector must be a Thermoflex CR-135 Heat Detector which responds to rate of rise and a fixed temperature of 57 degrees C. This is a non-addressable device. A Notifier FMM-101A mini monitor module (with end-of-line resistor) must be placed in the box behind the heat detector in order to interface the heat detector to the addressable system. This arrangement facilitates the inexpensive replacement of heat detectors by VSB maintenance staff. Fully addressable heat detectors are not permitted.

Where a given floor area is not sprinklered throughout, a heat detector must be provided in:

(a) each storage room within that floor area;

(b) each service room within that floor area (except an electrical, telecom, or elevator machine room where a smoke detector is to be provided);

(c) each janitor room within that floor area.

.7 ADDRESSABLE MONITOR MODULES

Addressable monitor modules must be provided and configured to permit the fire alarm system to monitor sprinkler flow switches, sprinkler valve handle switches, sprinkler dry valve pressure switches, dry system compressor pressure switches, heat trace controller trouble contacts, and other devices.

Each single-input mini monitor module (for installation behind a non-addressable device within a device box) must be a Notifier FMM-101A monitor module.

Each single-input standard monitor module (for installation in a stand-alone 4X4 box) must be a Notifier FMM-1A monitor module.

Each dual-input monitor module must be a Notifier FDM-1A monitor module.

Each 10-input monitor module must be a Notifier XP10-MA monitor module. A Notifier BB-XP cabinet must be provided for this module.

.8 ADDRESSABLE RELAY MODULES

Addressable relay modules must be provided and configured to permit the fire alarm system to release door hold-open devices, shut down mechanical units, start smoke control systems, and initiate other actions.

Each single-relay module must be a Notifier FRM-1A relay module.

Each 6-relay module must be a Notifier XP6-RA relay module. For a single 6-relay module or a pair of 6-relay modules, a Notifier BB-XP cabinet must be provided.

Where a load exceeds the load rating of the Notifier relay module contacts, a heavy-duty industrial grade ice cube type relay (Allen-Bradley or Square D) must be used to switch the load. The Notifier relay module can then be used to switch the industrial relay.

One or more Notifier XP6A-RA relay modules must be provided in each elevator machine room such that there are [4] relay outputs plus an additional relay output for each floor served by the elevator.

The Relay 1 output must indicate the activation of the smoke detector in the elevator machine room.

The Relay 2 output must indicate the activation of the smoke detector at the top of the elevator shaft.

The Relay 3 output must indicate the activation of the heat detector at the bottom of the elevator shaft.

The Relay 4 output must indicate the initiation of a general fire alarm condition.

Provide additional relays, one for each elevator landing. Each additional relay must indicate the activation of the smoke detector on the elevator landing to which it has been assigned.

Where an elevator machine room is not required, the relay module(s) must be provided at or near the location of the elevator controller.

.9 DOOR HOLD-OPEN DEVICES

Where a door is located in a fire separation and the Architect has determined that the door must be held open under normal conditions, one (for a single door) or two (for a double door) hold-open devices must be provided and configured such that the door is held open under normal conditions but will close when a fire alarm condition initiates.

Each door-hold-open device must be an Edwards 1500 Series device.

.10 BELLS

Only bells are acceptable as audible notification appliances. (Horns are not acceptable.)

Each bell must be placed on a notification appliance circuit dedicated to bells only.

Bells must be provided such that:

(a) the (bell) alarm signal is clearly audible throughout each floor area;

(b) the sound pressure level of the (bell) alarm signal at any point in any floor area is not more than 110 dBA;

(c) the sound pressure level of the (bell) alarm signal at any point in any floor area is not less than 65 dBA;

(d) the sound pressure level of the (bell) alarm signal at any point in any floor area is not less than 10 dBA above the maximum ambient noise level at the point in question.

Each bell must be a Notifier KMS-10-24A bell.

Each bell specified for outdoor use must be surface mounted on a Notifier WBB weatherproof back box.

.11 STROBES

Strobes must be provided:

(a) in each gymnasium;

(b) in each multi-purpose room;

(c) in each theatre or performance space;

(d) in each shop area;

(e) in each washroom;

(f) in each changeroom;

(g) in each space where the ambient sound level could exceed 87 dBA;

(h) in each space intended primarily for the use of persons with hearing impairment;

(i) in each space where occupants use ear protection devices;

(j) in each space where occupants could be within a sound insulating enclosure.

Strobe configuration and intensity rating must be selected in accordance with the appropriate ULC standard.

Each strobe must be placed on a notification appliance circuit dedicated to strobes only.

Each strobe notification appliance circuit must be synchronized by means of a Notifier MDL3RA strobe synchronization module. (This requirement is intended to protect occupants susceptible to photosensitive epilepsy.)

Each wall strobe (not specified for outdoor use) must be a SpectrAlert Advance SRA strobe.

Each wall strobe specified for outdoor use must be a SpectrAlert Advance SRKA strobe.

Each ceiling strobe (specified for indoor or outdoor use) must be a SpectrAlert Advance SCRKA strobe.

.12 END-OF-LINE DEVICES

Each box containing an end-of-line device must contain only the end-of-line device and no other devices.

Each coverplate for a box containing an end-of-line device must be a Notifier EOL-CR coverplate with a red enamel finish.

4 POWER CIRCUIT FOR FIRE ALARM PANEL

.1 The electrical design must specify a dedicated 1P2W, 120V, 15A circuit for the fire alarm control panel. The circuit must be clearly identified as "FIRE ALARM CONTROL PANEL" on the relevant panelboard directory. The circuit breaker handle must be red. The electrical design must specify that the branch circuit conductors must run in 21mm raceway.

5 FIRE ALARM MONITORING

.1 If the scope of electrical work for a given project includes the provision of a new fire alarm system, the Electrical Consultant must remind the VSB Project Manager to arrange for a new monitoring contract with Chubb Edwards.

.2 Where a new autodialer is to be provided by Chubb Edwards, (or where an existing autodialer is to be relocated) the Electrical Consultant must ensure that the electrical design incorporates all electrical support infrastructure for the new or relocated autodialer.

The electrical design must identify sufficient space for the autodialer on a backboard near the fire alarm control panel. The space must be dimensioned and clearly marked "RESERVED FOR FIRE ALARM AUTODIALER" on the relevant electrical drawing.

The electrical design must specify a dedicated 1P2W, 120V, 15A circuit for the autodialer. The circuit must be clearly identified as "AUTODIALER" on the relevant panelboard directory. The circuit breaker handle must be red. The electrical design must specify a 4X4 box next to the autodialer location as well as 21mm raceway between the panelboard and the 4X4 box. Autodialer circuit conductors must run from the panelboard (through the 21mm raceway) to the box. The conductors must be capped, taped, and coiled up in the box. The box must be labelled "AUTODIALER POWER CIRCUIT". Chubb Edwards will complete the power connection to the autodialer.

The Electrical Consultant must remind the VSB Project Manager to notify VSB maintenance staff to identify a fire alarm telephone line on the main BIX terminations at the Telus demarcation. The electrical design must specify:

(a) a 4X4 box next to the autodialer location;

(b) 21mm EMT from the Telus demarcation to the 4X4 box;

(c) a 4-pair CAT3 UTP CMR cable from the demarcation (through the 21mm EMT) to the 4X4 box (450mm of slack must be coiled up in the box);

(d) the termination of one pair (of the CAT3 cable) on the terminals identified for the fire alarm telephone line at the Telus demarcation;

(e) that the box must be labelled "AUTODIALER TELEPHONE LINE";

(f) that Chubb Edwards will complete the telephone line connection to the autodialer.

The electrical design must specify the configuration of a number of fire alarm control panel output relays. (These relays are located within the fire alarm control panel.) Each relay must operate when a specific condition is initiated. Typically, there are four relays which operate as described below:

FIRE ALARM CONTROL PANEL OUTPUT RELAY 1 - ALARM (Operates when an alarm condition is initiated.)

FIRE ALARM CONTROL PANEL OUTPUT RELAY 2 - SPRINKLER FLOW (Operates when a sprinkler flow condition is initiated.)

FIRE ALARM CONTROL PANEL OUTPUT RELAY 3 - SUPERVISORY (Operates when a supervisory condition is initiated.)

FIRE ALARM CONTROL PANEL OUTPUT RELAY 4 - GENERAL TROUBLE (Operates when a general trouble condition is initiated.)

The electrical design must specify:

(a) a 4X4 box next to the autodialer location;

(b) 21mm EMT from the fire alarm control panel to the box;

(c) that a 4-pair CAT3 UTP CMR cable is to run from the fire alarm control panel (through the 21mm EMT) to the 4X4 box and that 450mm of slack must be coiled up in the box;

(d) that each of the four pairs within the cable is to be terminated on one of the four relays at the fire alarm control panel;

(e) that each pair is to be labelled in the 4X4 box with the appropriate output relay name (Example: ALARM, SPRINKLER FLOW, SUPERVISORY, GENERAL TROUBLE);

(f) that the box must be labelled "FIRE ALARM CONTROL PANEL RELAY OUTPUTS";

(g) that Chubb Edwards will complete the relay connections to the autodialer.

.3 As the Electrical Consultant possesses technical knowledge concerning the fire alarm system that the VSB Project Manager does not, it is incumbent on the Electrical Consultant to assist the VSB Project Manager in implementing a new monitoring contract. In particular, the Electrical Consultant must assist the VSB Project Manager in meeting the requirements of City of Vancouver Bulletin 2000-021-EL.

.4 As the verification of a new fire alarm system cannot be completed without the verification of the autodialer, and as the verification of the autodialer cannot be completed until the fire alarm system is verified, the Electrical Consultant must arrange for the Chubb Edwards technician to coordinate on site with the fire alarm system verifier (Viking) at the end of the fire alarm verification process.

.5 The Electrical Consultant must remind the VSB Project Manager that the ULC certificate provided by Chubb Edwards must be placed in a plastic sleeve and posted next to the autodialer.

6 FIRE ALARM WIRING AND RACEWAY

.1 A complete and functional fire alarm raceway system must be provided. The raceway system must provide a continuous and fully enclosed pathway:

(a) from each fire alarm device to the fire alarm control panel;

(b) from the graphic annunciator to the fire alarm control panel.

.2 The fire alarm raceway system must include all necessary conduit, tubing, duct, wireway, fittings, fasteners, clamps, adapters, device boxes, pull boxes, supports, and hangers.

.3 Unless noted otherwise in this standard, all fire alarm cables in an ordinary location must be installed in EMT.

.4 Fire alarm cables in a damp or wet location must be approved for use in wet locations.

.5 Underground locations within the building footprint must be designated as wet locations.

.6 Locations within below-grade concrete or masonry must be designated as wet locations.

.7 Fire alarm cables in concrete or masonry elements must be installed in RPVC conduit.

.8 Fire alarm cables in an underground location must be installed in RPVC conduit.

.9 Fire alarm cables in a damp or wet location (not underground or in concrete or masonry) must be installed in EMT with wet location couplings and connectors.

.10 Fire alarm cables in a hazardous location must be installed in rigid metal conduit.

.11 In a location where fire alarm cables would be subject to mechanical damage without significant protection, the cables must be installed in rigid metal conduit.

.12 Where a fire alarm cable is to be connected to a sprinkler device, liquid tight flexible metallic conduit (Sealtite by Anamet Canada) must be used between the device and the upstream box. The box must be located such that the liquid tight flexible metallic conduit does not exceed 1.5 meters in length.

.13 Each pull box in a raceway system designated for fire alarm cables must be configured to permit straight pulls only.

.14 There must be no more than 180 degrees of bending between any two consecutive pull points in a fire alarm raceway system.

.15 There must be no more than 30 meters of raceway length between any two consecutive pull points in a fire alarm raceway system.

.16 Fire alarm raceway must not be smaller than 21mm.

.17 Unless noted otherwise in this standard, fire alarm raceway must be concealed.

.18 Fire alarm raceway may be exposed in a service space or on an open ceiling.

.19 No splices are allowed in a fire alarm pull box.

7 VERIFICATION

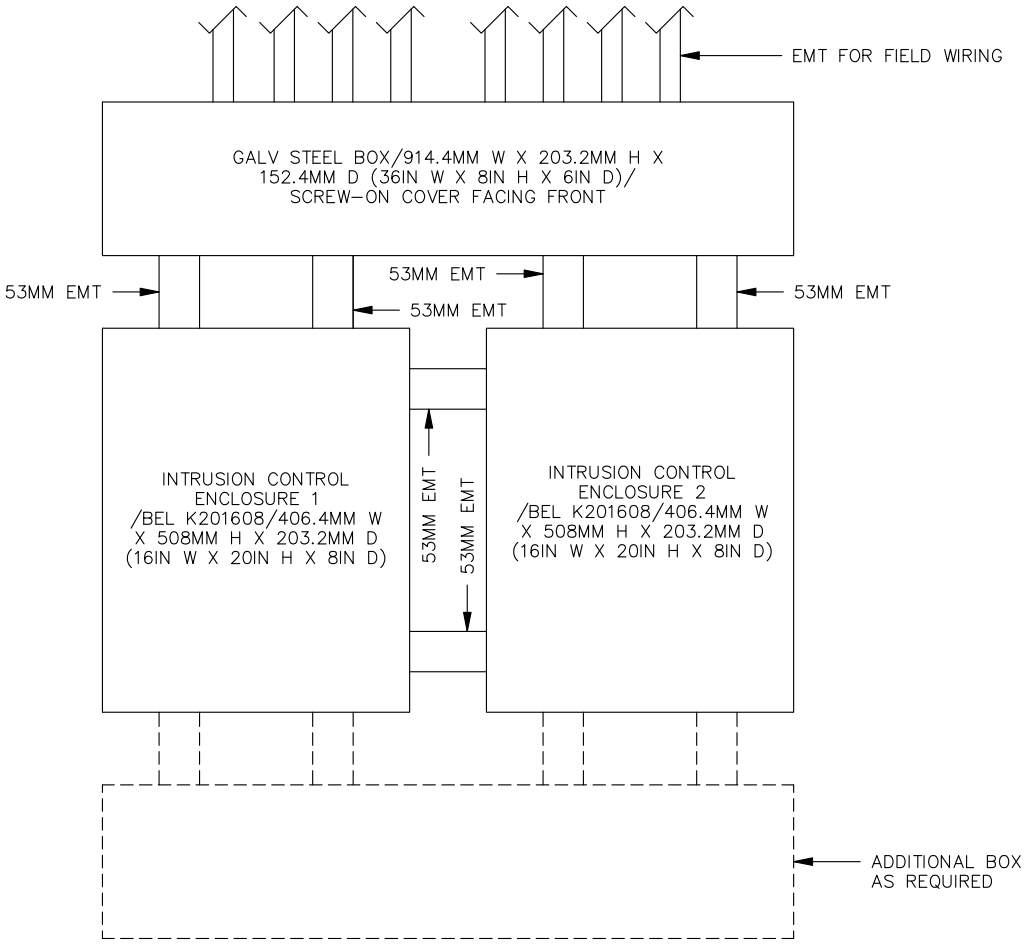
.1 The electrical design must specify that at substantial completion, Viking Fire Protection must verify the fire alarm system in accordance with CAN/ULC S537 "Verification of Fire Alarm Systems".

.2 A VSB Electrician must be present during the verification. The VSB Electrical Supervisor (604-713-5649) must be informed of the verification date at least 2 weeks in advance.

.3 The verification report must include "Appendix C" from ULC Standard S537.

8 IDENTIFICATION

.1 Refer to the subsection entitled "Identification" in Section 01 00 50 "General Electrical Requirements".



VANCOUVER SCHOOL BOARD

DATE

2018-09-01

PROJECT TITLE

VSB ELECTRICAL STANDARD

DRAWING TITLE

ARRANGEMENT OF INTRUSION CONTROL ENCLOSURES & ASSOCIATED RACEWAY

PROJECT NUMBER

XXXX

DRAWING NUMBER

E101A

SCALE

NTS

VSB Design and Construction Standards
Bulletin 2019-02(electrical)

UPDATE TO EDITION 6 (dated Feb18, 2019) OF THE VSB ELECTRICAL STANDARD

FOR RELEASE / NOVEMBER 15, 2019

Notes:
The current VSB electrical standard was issued as Edition 6 dated Feb 18, 2019.

This bulletin identifies changes and additions to that standard. As of the date of this notice, these revisions are considered in force and a requirement of the VSB Building Standards.

These edits will be formally incorporated into the standards document at a future date.

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1 ADDITIONAL PART FOR SECTION 01 99 50 (GENERAL ELECTRICAL REQUIREMENTS)

~~ELECTRICAL CONTRACTOR AND ELECTRICAL FOREMAN - QUALIFICATIONS AND EXPERIENCE~~

~~.1 Each electrical contractor who submits a quotation for electrical work on a VSB project must:~~

~~(a) be in possession of a Class 'A' Electrical Contractor's license recognized by the Authority Having Jurisdiction;~~

~~(b) have been in business as an electrical contractor for a minimum of 10 years;~~

~~(c) be capable of providing documented evidence that the electrical contractor has successfully completed work on at least three projects in British Columbia within the last five years, where in each case, the scope and complexity of the work was comparable to or exceeded that of the electrical work associated with the VSB project for which the quotation is submitted;~~

~~(d) be capable of providing contact information for the Site Superintendent associated with each of the three projects described above;~~

~~(e) be capable of providing contact information for the Owner's Representative associated with each of the three projects described above.~~

~~.2 Each electrical contractor who submits a quotation for electrical work on a VSB project must confirm in writing that the electrical work will be performed under the direct on-site supervision of an Electrical Foreman who:~~

~~(a) is a full-time employee of the Electrical Contractor;~~

~~(b) holds an electrical journeyman's qualification recognized by the Authority Having Jurisdiction;~~

~~(c) has held the aforementioned journeyman's qualification for a minimum of 10 years;~~

~~(d) holds a Class 'A' or 'B' Field Safety Representative (FSR) certificate;~~

~~(e) has worked as an Electrical Foreman for a minimum of 5 years;~~

~~(f) is able to provide documented evidence that he has successfully worked as an Electrical Foreman for the full construction schedule of at least three projects in British Columbia within the last five years, where in each case, the scope and complexity of the work was comparable to or exceeded that of the electrical work associated with the VSB project for which the quotation is submitted;~~

~~(g) is able to provide contact information for the Site Superintendent associated with each of the three projects described above.~~

2 ADDITIONAL ITEM FOR PART 1 (GENERAL) OF SECTION 26 05 33 (RACEWAY AND BOXES)

.1 Raceway fill for Class 2 circuits must not exceed 40%.

3 REVISIONS TO PART 1 (GENERAL) OF SECTION 26 09 13 (ELECTRICAL POWER MONITORING)

.1 Item 1 has been deleted.

.2 ASHRAE Standard 90.1-2016 (except Section 8.4.2) became effective in Vancouver on June 3, 2019. Section 8.4.3 (Electrical Energy Monitoring) and all other relevant parts of 90.1-2016 must be complied with.

.3 Item 9 has been revised to indicate that the VSB Energy Manager and the VSB Electrical Supervisor may waive or modify only those requirements outside of the scope of ASHRAE 90.1-2016.

.4 Unless an exception has been granted by the VSB Energy Manager, energy consumption for each HVAC unit rated over 20 kW must be monitored, recorded, and reported.

4 REVISIONS TO PART 1 (GENERAL) OF SECTION 26 43 13 (SURGE PROTECTIVE DEVICES)

.1 The requirement for a surge protective device in each distribution panelboard has been deleted from Item 3.

5 REVISION TO ITEM 3 OF PART 9 (CATEGORY 6 HORIZONTAL COPPER CABLING, TERMINATIONS, AND PATCH PANELS) OF SECTION 27 10 00 (TELECOM CABLING)

.1 Item 3 has been revised to allow the use of CMR (non-plenum rated) horizontal cable if the cable is completely enclosed in raceway from the telecom room to the user outlet. (Note that metallic raceway is required in all locations except those locations underground or in concrete and masonry.)

6 REVISION TO ITEM 3 OF PART 15 (TELECOM RACEWAY AND CABLE TRAY) OF SECTION 27 10 00 (TELECOM CABLING)

.1 Item 3 has been revised to indicate that horizontal telecom cable may run in damp or wet locations provided that the cable is approved for wet locations and run in raceway.

7 ADDITIONAL ITEM FOR PART 2 (GENERAL) OF SECTION 28 16 00 (INTRUSION DETECTION)

.1 Each intrusion sensor box must be wall mounted. The centre of each intrusion sensor box must not be located above 2750mm (9FT).

8 ADDITIONAL ITEMS FOR PART 1 (GENERAL) OF SECTION 28 31 00 (FIRE DETECTION AND ALARM)

.1 Each fire alarm system must be designed with "STYLE B" wiring as illustrated in Figure 2.2 on Page 56 of CAN/ULC Standard S524:2014-AMD1 (Standard for the Installation of Fire Alarm Systems).

.2 Each SLC branch must originate on an isolator. Each isolator (where an SLC branch originates) will typically be part of an isolator card within the main fire alarm control panel. Stand-alone isolators may be installed in electrical rooms where required. Stand-alone isolators may only be installed in other locations if required by Code or if allowed by the VSB Electrical Supervisor.

9 REVISIONS TO ITEM 2 (GRAPHIC ANNUNCIATOR) OF PART 3 (PRODUCTS) OF SECTION 28 31 00 (FIRE DETECTION AND ALARM)

.1 The Notifier CAB-4 Series cabinet used for the graphic annunciator must be at least Size 'D'.

.2 Legible room numbers must be placed on each plan appearing on the annunciator graphic.

10 ADDITIONAL ITEMS FOR PART 3 (PRODUCTS) OF SECTION 28 31 00 (FIRE DETECTION AND ALARM)

.1 FIRE ALARM SIGNALING LINE CIRCUIT (SLC) CABLE - DRY LOCATIONS ONLY

Acceptable Products

(a) Texcan 26313 03 030 (3-Conductor / #18AWG / Unshielded / Untwisted / FAS105 / FT4 / 300V / Red Outer Jacket)

(b) Equivalent product approved in writing by the VSB Electrical Supervisor.

.2 FIRE ALARM SIGNALING LINE CIRCUIT (SLC) CABLE - WET, DAMP, OR DRY LOCATIONS

Acceptable Products

(a) Belden 5302U1 (4-Conductor / #18 AWG / Water-Blocked / Unshielded / Untwisted / CMG / FT4 / 300V / Black Outer Jacket)

Conductor 1 - Black / Conductor 2 - White / Conductor 3 - Red / Conductor 4 - Green

Use black and red conductors for the SLC. Use the green conductor for bonding. Leave the white conductor spare.

(b) Equivalent product approved in writing by the VSB Electrical Supervisor.

.3 NOTIFICATION APPLIANCE CIRCUIT (NAC) CONDUCTOR GROUP / 24V POWER CIRCUIT CONDUCTOR GROUP / #14 AWG - WET, DAMP, OR DRY LOCATIONS

Acceptable Products

(a) [3] #14 RW90 XLPE conductors (Conductor 1 - Red / Conductor 2 - Black / Conductor 3 - Green)

(b) Equivalent product approved in writing by the VSB Electrical Supervisor.

.4 NOTIFICATION APPLIANCE CIRCUIT (NAC) CONDUCTOR GROUP / 24V POWER CIRCUIT CONDUCTOR GROUP / #12 AWG - WET, DAMP, OR DRY LOCATIONS

Acceptable Products

(a) [3] #12 RW90 XLPE conductors (Conductor 1 - Red / Conductor 2 - Black / Conductor 3 - Green)

(b) Equivalent product approved in writing by the VSB Electrical Supervisor.

11 ADDITIONAL ITEMS FOR PART 6 (FIRE ALARM WIRING AND RACEWAY) OF SECTION 28 31 00 (FIRE DETECTION AND ALARM)

.1 Voltage drop limits (specified by Notifier for each type of fire alarm circuit) must not be exceeded.

.2 Fire alarm raceway fill must not exceed 40%.

APPENDIX 1J
AUDITORIUM SPECIFICATIONS

TABLE OF CONTENTS

APPENDIX 1J

AUDITORIUM SPECIFICATIONS

1. INTRODUCTION

1.1 Proposal of Alternate Means, Methods or Solutions

1.1.1 This Appendix 1J contains certain prescriptive requirements regarding the Work related to the Auditorium. The Design-Builder may propose for review and consent by the Owner, in its sole discretion, alternate products, materials, means, methods or solutions, which will demonstrably achieve the same or better performance as that specified in this Appendix 1J. If the Owner consents to such alternates, the change will be implemented by a Change Order.

1.2 Auditorium Cash Allowance

1.2.1 The Design-Builder is responsible for performing the Work described in, and providing all items called for, in this Appendix 1J(A). Notwithstanding the foregoing, the Design-Builder will not proceed with a cash allowance item unless and until the Owner authorizes the performance of such item in accordance with Section 45 of the Design-Build Agreement.

1.2.2 If the Owner does not authorize a cash allowance item or the Owner authorizes a cash allowance item that adversely impacts the Design-Builder's ability to perform an obligation or requirement in Appendix 1J, including any design or performance requirements, then the Design-Builder will not be responsible for meeting such obligation or requirement in Appendix 1J, provided that the Design-Builder will have the burden of proof to demonstrate that the Owner's failure to authorize a cash allowance item, or decision to authorize a specific cash allowance item, directly caused the Design-Builder's inability to meet the obligation or requirement in Appendix 1J.

1.2.3 Only those items which are expressly marked as a cash allowance item by a "X" in the column labelled Cash Allowance in Appendix 1J(A) will be expended and paid as a cash allowance.

1.2.4 The identification of certain items as a "Base Building" item in Appendix 1J(A) are for convenience only and does not alter the scope of the cash allowance items. The items listed in Appendix 1J(A) is not meant to be a comprehensive list of all equipment which may be required by this Appendix 1J(A).

1.3 Use of the Auditorium

1.3.1 The Design-Builder acknowledges and agrees that:

1.3.1.1 the primary use of the Auditorium will be to support the educational activities of the School, including class assemblies, common lectures between classes and grades, as well as supporting a robust drama, music and fashion program with numerous rehearsals and performances throughout the academic year; and

1.3.1.2 the Auditorium will also be used as a community resource and rented out for various activities after School hours for both traditional and non-traditional events.

1.3.2 To support the use as an educational and community resource, the Design-Builder will ensure that the design includes and addresses the following requirements:

1.3.2.1 provide clearly demarcated access to the School Commons from the parking area adjacent to the School, including appropriate exterior wayfinding signage, in support of the function of the School Commons as lobby space for the Auditorium;

1.3.2.2 provide a loading facility for the Auditorium where goods and scenery can be moved from the exterior of the School directly onto the stage;

1.3.2.3 provide adequate washroom facilities for the capacity of 350 seats which are directly connected to the School Commons and are within the secure zone required by Section 3.4.6 of the Statement of Requirements;

1.3.2.4 as referenced in the Statement of Requirements, ensure that the Auditorium and support spaces are “zoned” to restrict access after School hours to the remainder of the School when it is being used as a community venue;

1.3.2.5 ensure that there is access for performers, staff and other users to enter and exit the back of stage areas directly from the exterior of the School;

1.3.2.6 ensure the dressing rooms can service both the Auditorium and the Drama Studio;

1.3.2.7 provide a control point which secures the Drama Studio from the Auditorium when the Auditorium is used by non-School users;

1.3.2.8 ensure the green room has two access doors, one which services the Drama Studio and one which services the Auditorium when used by non-School users; and

1.3.2.9 provide a gender-neutral washroom that services the dressing room.

2. AUDITORIUM PROGRAM ASSUMPTIONS

2.1 Proscenium Auditorium

2.1.1 The overall program area for the Auditorium is 620 SM. Refer to Table 1 – Auditorium Program Area Summary. The room data sheets in Section 3 present detailed information on each programmed room.

2.1.2 Figure 1 presents an adjacency diagram for the Auditorium’s ground floor and Figure 2 presents an adjacency diagram for the Auditorium’s second floor.

Table 1 – Auditorium Program Area Summary

Summary

Area	Net Area (m2) 350 seats
Summary	
Stage and Audience Chamber	548
Performer Support	72
Total Net Area	**620**

Area	Net Area (m2) 350 seats	Notes
Stage and Audience Chamber		
Audience Chamber	293	
Stage (acting area)	94	Proscenium 11m wide X 8.5m deep
Stage (Area for masking drapes)	53	3m wide x 8.5m deep per side
Wing space - left and right	83	Allow each side 4.9m
Control Room - Lighting	10	
Control Room - Sound	10	
Control Room - Stage Management	6	
Total - Stage and Audience Chamber	**548**	
Performer Support		
Dressing Room - Chorus (1)	28	gender neutral
Dressing Room - Chorus (1)	28	gender neutral
Dressing Room Small (1)	11	gender neutral
WC (Gender Neutral)	5	gender neutral
Total - Performer Support	**72**	

Figure 1: Adjacencies Diagram for Auditorium on Ground Level

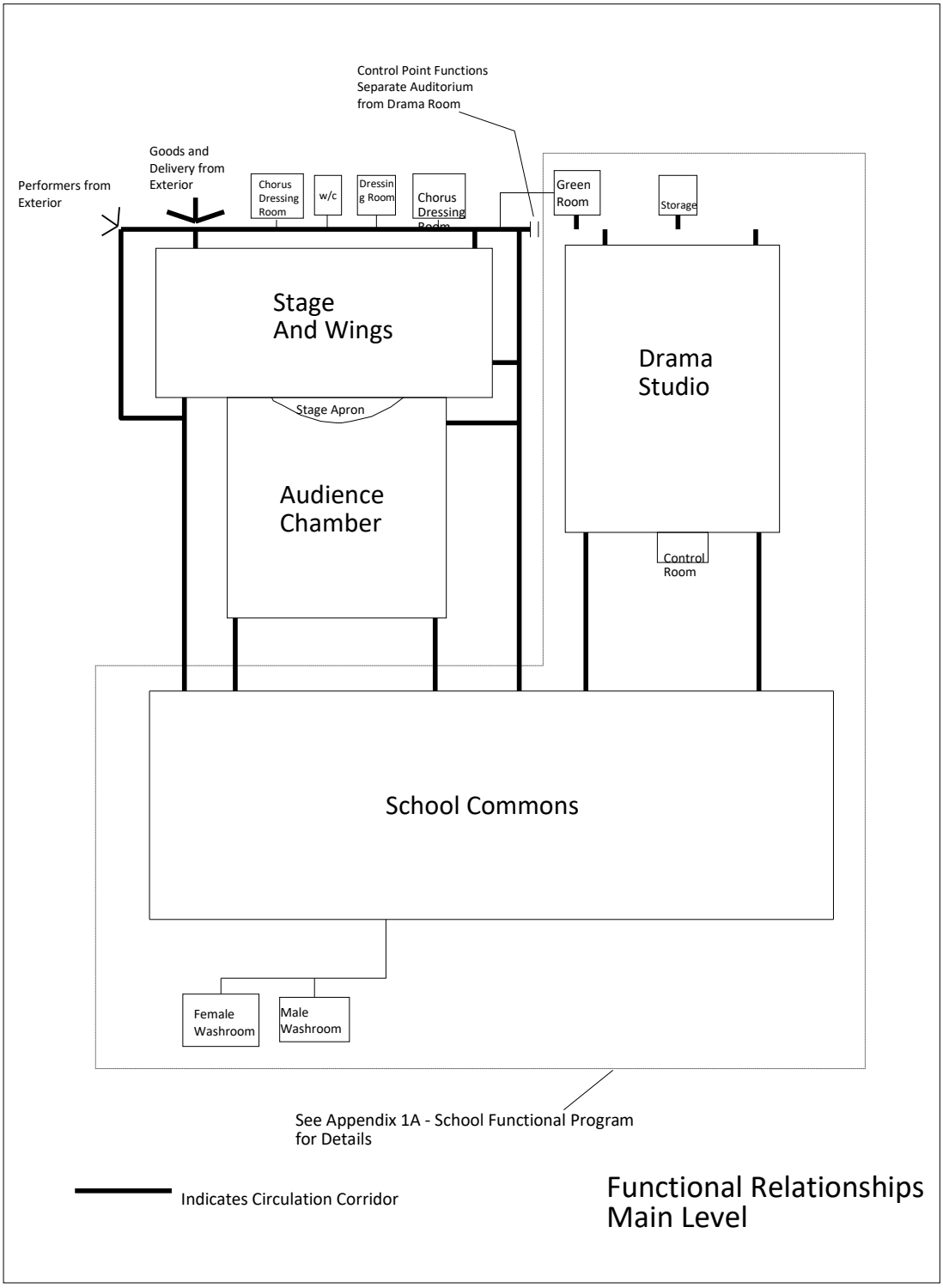
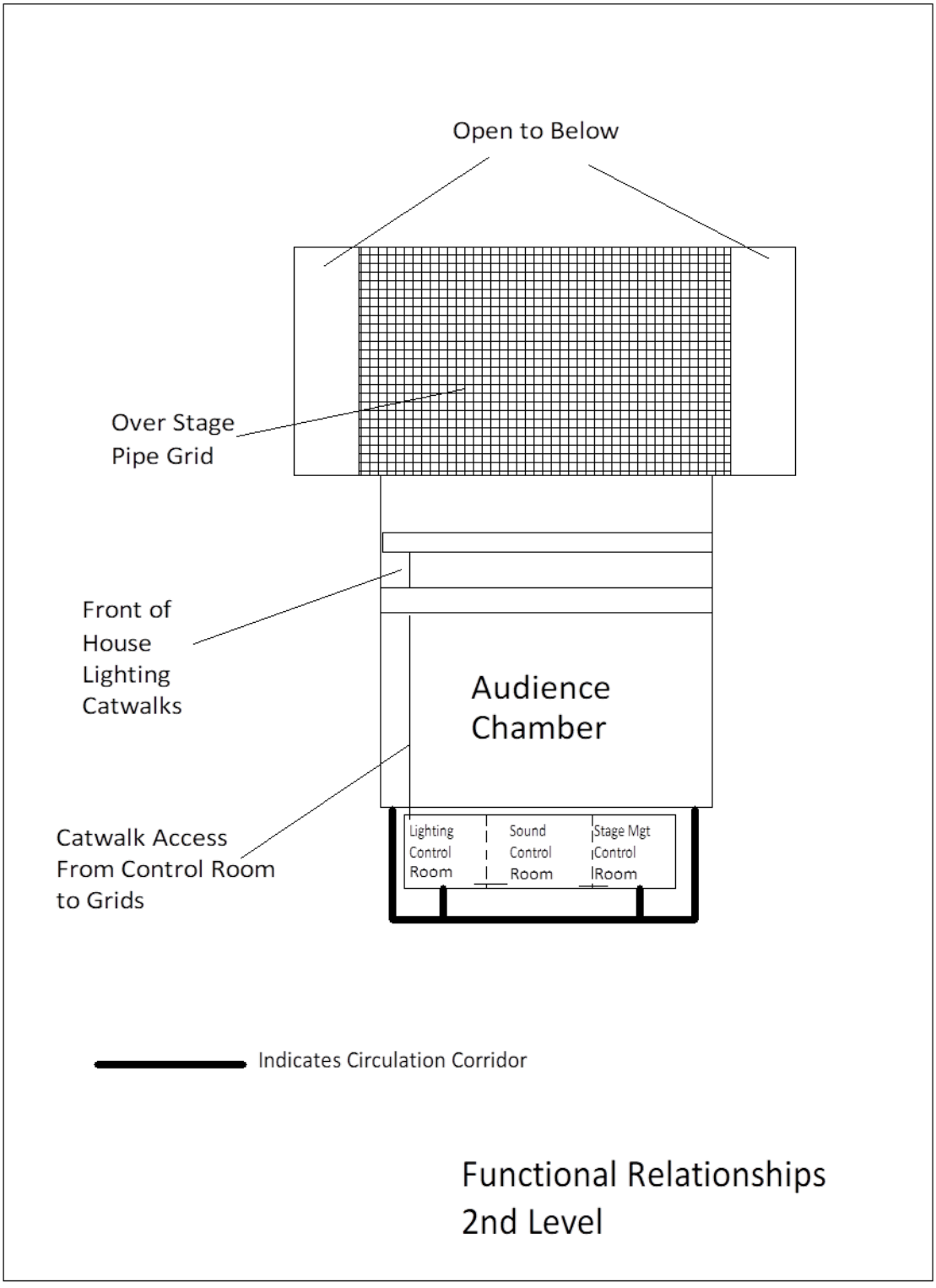

Control Point Functions
Separate Auditorium
from Drama Room
Goods and
Delivery from
Exterior
Performers from
Exterior
Chorus
Dressing
Room
w/c
Dressin
g Room
Chorus
Dressing
Room
Green
Room
Storage
Stage
And Wings
Drama
Studio
Stage Apron
Audience
Chamber
Control
Room
School Commons
Female
Washroom
Male
Washroom
See Appendix 1A - School Functional Program
for Details
Indicates Circulation Corridor
Functional Relationships
Main Level

Figure 2: Adjacencies Diagram for Auditorium on Second Level



3. ROOM DATA SHEETS

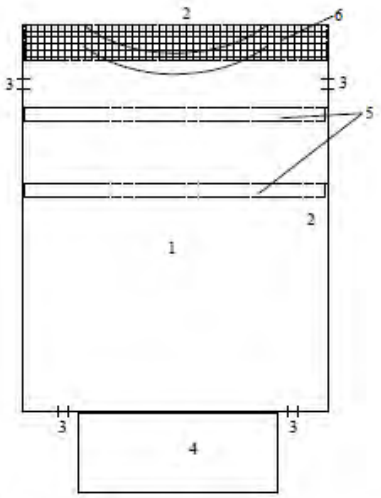
3.1 Room Data Sheets

3.1.1 The following room data sheets outline specific requirements for each programmed room in the Auditorium.

Eric Hamber Secondary School Replacement

Group / Sub-Group: Fine Arts - Auditorium *Date*
Space: Audience Chamber *Room No* 14.001

Diagram:



Description:
Space holding the audience, seating, lighting catwalks and other technical areas

Area: 293 sm
Occupancy: 350

Elements:
1- seating
2- stage apron
3- light and sound locks
4- control rooms
5- lighting catwalks
6- forestage acoustical reflector

Auditorium Systems (see Technical Section for min quantities

headset:	yes
programme sound:	no
lobby sound:	no
stage lighting Ethernet:	yes
stage lighting circuits:	front of house catwalks
video:	yes

Shell:
critical dimensions:
plan: to suit good sightlines and acoustics for dance, drama and music; Proscenium width 11m, height 7 m
ceiling height: minimum of chamber 11m to clear ceiling height
floor loading: Live Load: 4.8 kPa; refer to Schedule 1 – Statement of Requirements for all other information
access: through light and sound locks
acoustics:
Background Noise: less than NC/RC 20
Noise Isolation: greater than STC 50
finishes:
floor: sealed concrete with aisles covered with vinyl composite tile
walls: decorative with acoustical treatment
ceiling: decorative with acoustical treatment
natural light: no requirement
outdoor access: no requirement
locks as per classroom locks
doors and frames see accoustical criteria Section

Services:
illumination: decorative house lighting dimmed LED (Dim to Black type), 3000°K; emergency lighting
power: standard and isolated ground
communications: no requirement
data: wireless network
water: no requirement
drainage: no requirement
HVAC: to meet accoustical guidelines, see acoustics section
other:

Notes:
Circuiting for microphones, data, speakers, video in audience chamber. Seats for handicapped patrons as per Vancouver Building By Law. Barrier free access from audience chamber to stage. See technical requirements section

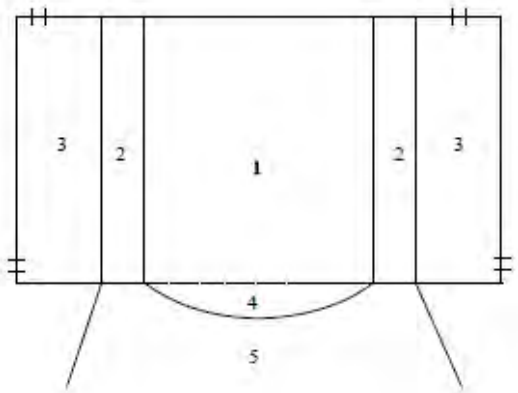
Magnetic holders (located in door closer mechanism) on audience chamber doors and frames which release on activation of the fire alarm. Released manually for performances

All FF&E elements are to be in Category 1 per Appendix 1D Furniture, Fixtures and Equipment unless noted otherwise

Eric Hamber Secondary School Replacement

Group / Sub-Group: Fine Arts - Auditorium *Date*
Space: Stage and wings *Room No* 14.002

Diagram:



Description:
Performance space with associated technical facilities

Area: Stage 146 sm and wings 83 sm

Occupancy: 50 (large cast show with cast and crew)

Elements:
1- acting area
2- area for masking drapes
3- wings
4- apron
5- audience chamber

Other Elements
sink - stainles steel double with particle trap
waterproof surround at sink 600mm blackplash and 600mm either side of sink, waterproof floor under sink
over stage pipe grid

Auditorium Systems (see Technical Section for min quantities

headset:	yes
programme sound:	no
lobby sound:	no
stage lighting circuits:	on stage level pipe grid
stage lighting Ethernet:	yes
video:	yes

Shell:
critical dimensions:
plan: proscenium opening - 11m (w) X 7m (ht); acting area 11m x 8.5m; drapes 3m x 8.5 m (2); wings (2) 4.9m x 8.5
ceiling height: 8.2m to underside of pipe grid
floor loading: Live Load: 4.8 kPa; refer to Schedule 1 – Statement of Requirements for all other information
access: from loading area and stage circulation corridor
acoustics:
Background Noise: less than NC/RC 20
Noise Isolation: greater than STC 50
finishes:
floor: sprung floor (see below) with plyron finish (black) (sprung floor continues onto stage wings)
walls: concrete, concrete block GWB
ceiling: n/a
natural light: no requirement
outdoor access: no requirement
locks as per classroom locks
doors and frames large loading door (double no mullion) (3m ht x 2.5m wt) from loading, roll up doors unacceptable; other doors see acoustical criteria section

Services:
illumination: stage lighting, work lighting, running lighting (blue)
power: 16 - 120v/15amp circuits, 10 isolated ground circuits, 2 - 100amp disconnects
communications: telephone (3)
data: school network
water: for sink
drainage: for sink
HVAC: silent operation see acoustical guidelines Section
other:

Notes:
Circuiting for microphones, data, speakers, video around stage. Pipe grid over stage (see technical section)

Sprung floor - finished layer 19mm Plyron on 1 layer of 19mm exterior T&G plywood with building paper in between layers on 2 x 4 sleepers, on 400mm centres, which are on neoprene pads (400mm centres) fibreglass insulation between sleepers.

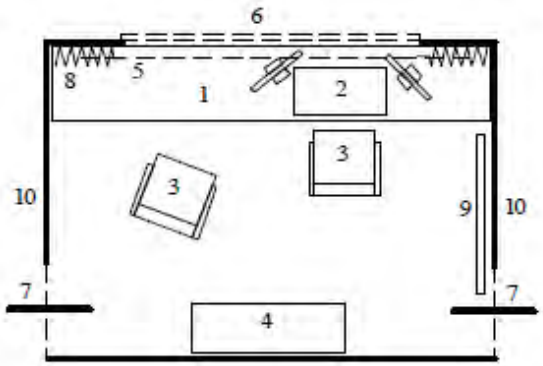
Paint walls mid-grey

All FF&E elements are to be in Category 1 per Appendix 1D Furniture, Fixtures and Equipment unless noted otherwise

Eric Hamber Secondary School Replacement

Group / Sub-Group:	Fine Arts - Auditorium	*Date*	
Space:	Lighting Control Room	*Room No*	14.005

Diagram:



Description:
Space at rear of the audience chamber from which the stage lighting system is operated.

Area: 10 sm
Occupancy: Max 3

Elements:
1- counter (height dependent on sight line to stage & accessibility) depth to accommodate consoles supplied
2- console
3- chairs (2) (Category 3 per Appendix 1D)
4- cabinet (1840 (H) x 950 (w) X 410 (d)) (locking)(1)
5- track lighting above
6- window (sash type) See notes below
7- access to other control rooms and FOH grids
8- blackout curtains
9- bulletin board (1000 x 1200) Refer to 6.9.2 Sch 1 SoR
10- pony wall separating lighting control room and stage mgt rm

Other Elements
clock, task lighting

Auditorium Systems (see Technical Section for min quantities

headset:	yes
programme sound:	yes
lobby sound:	no
stage lighting Ethernet:	yes
video:	no

Shell:
critical dimensions:
plan: to suit design maximize window space (min 1m x 2m)
ceiling height: 2.4m min
floor loading: Live Load: 3.6 kPa; refer to Schedule 1 – Statement of Requirements for all other information
access: from common light lock direct connection between rooms
acoustics: *Background Noise: NC/NRC 30* *Noise Isolation: STC 50*
finishes:
floor: vinyl composite tile (VCT)
walls: GWB
ceiling: exposed structure ; paint black
natural light: no requirement
outdoor access: no requirement
locks as per classroom locks
doors and frames Type A wood Statement of Requirements Section 6.7.6; Steel Frame Statement of Requirements 6.7.4

Services:
illumination: work lighting (LED 3000°K) track lighting above console (dimmed)
power: 5 - 120v/15amp ccts
communications: headset, telephone
data: no requirement
water: no requirement
drainage: no requirement
HVAC: as per audience chamber
other:

Notes:
Windows will be single glazing and be large (min 1m x 2m) and will open by "sash" type counterweighted into cavity above. Operator must be able to see over an audience member standing in row immediately in front of the windows.

Direct access to FOH catwalks

Lighting, sound & stage management control rooms are housed in same control room with pony walls (ht 1.5m) separating each area. Provide universal barrier free access

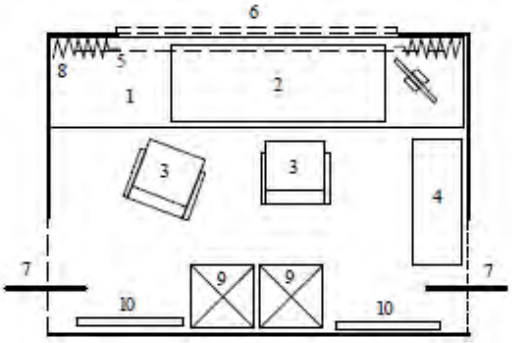
Track lighting fixtures shall be framing projectors (fixtures) to control light spill. Paint back wall Black & other walls mid-grey

All FF&E elements are to be in Category 1 per Appendix 1D Furniture, Fixtures and Equipment unless noted otherwise

Eric Hamber Secondary School Replacement

Group / Sub-Group: Fine Arts - Auditorium *Date*
Space: Sound Control Room *Room No* 14.006

Diagram:



Description:
Space at rear of the audience chamber from which the stage sound system is operated.

Area: 10 sm
Occupancy: 2

Elements:
1- counter (height dependent on sight line to stage & accessibility) depth to accommodate consoles supplied
2- console
3- chairs (2) (Category 3 per Appendix 1D)
4- cabinet (1840 (H) x 950 (w) X 410 (d)) (locking)(1)
5- track lighting above
6- window (sash type) See notes below
7- access to other control rooms
8- blackout curtain
9- equipment racks
10- bulletin board (1000 x 1200) Refer to 6.9.2 Sch 1 SoR

Other Elements
clock, monitor speakers, task lighting

Auditorium Systems (see Technical Section for min quantities

headset:	yes
programme sound:	yes
lobby sound:	no
stage lighting Ethernet:	yes
video:	no

Shell:
critical dimensions:
plan: to suit design maximize window space (min 1m x 2m)
ceiling height: 2.4m min
floor loading: Live Load: 3.6 kPa; refer to Schedule 1 – Statement of Requirements for all other information
access: from common light lock direct connection between rooms
acoustics: *Background Noise: NC/NRC 30* *Noise Isolation: STC 50*
finishes:
floor: vinyl composite tile (VCT)
walls: GWB
ceiling: exposed structure ; paint black
natural light: no requirement
outdoor access: no requirement
locks as per classroom locks
doors and frames Type A wood Statement of Requirements Section 6.7.6; Steel Frame Statement of Requirements 6.7.4

Services:
illumination: work lighting (LED 3000°K) track lighting above console - dimmed)
power: 5 - 120v/15amp ccts and isolated power panel for equipment racks
communications: headset, telephone
data: no requirement
water: no requirement
drainage: no requirement
HVAC: as per audience chamber
other:

Notes:
Windows will be single glazing and be large (min 1m x 2m) and will open by "sash" type counterweighted into cavity above. Operator must be able to see over an audience member standing in row immediately in front of the windows.

Lighting, sound & stage management control rooms are housed in same control room with pony walls (ht 1.5m) separating each area.

Track lighting fixtures shall be framing projectors (fixtures) to control light spill.

Provide universal barrier free access

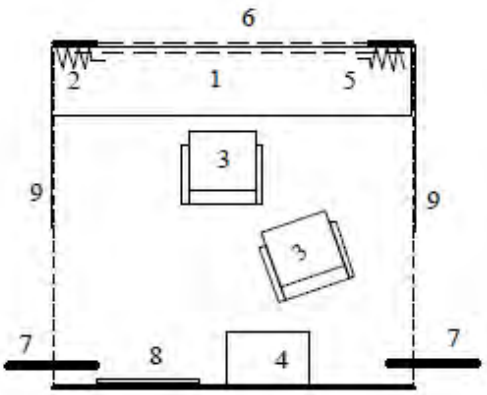
Paint back wall black & other walls mid-grey

All FF&E elements are to be in Category 1 per Appendix 1D Furniture, Fixtures and Equipment unless noted otherwise

Eric Hamber Secondary School Replacement

Group / Sub-Group:	Fine Arts - Auditorium	*Date*	
Space:	Stage Management Control Room	*Room No*	14.007

Diagram:



Description:
Space at rear of the audience chamber from which the stage manager operates the show

Area: 6 sm
Occupancy: 2

Elements:
1- counter (height is dependent on sight line to stage); depth 500mm
2- blackout curtain
3- chairs (2) (Category 3 per Appendix 1D)
4- cabinet (1840 (H) x 950 (w) X 410 (d)) (locking)(1)
5- track lighting above
6- window (sash type) See notes below
7- access to other control rooms
8- bulletin board (1000 x 1200) Refer to 6.9.2 Sch 1 SoR
9- pony wall separating control rooms

Other Elements
clock, task lighting

Theatre Systems (see Technical Section for min quantities)

headset:	yes
programme sound:	yes
lobby sound:	no
stage lighting Ethernet:	yes
video:	no

Shell:

critical dimensions:
plan: to suit design maximize window space (min 1m x 2m)
ceiling height: 2.4m min
floor loading: Live Load: 3.6 kPa; refer to Schedule 1 – Statement of Requirements for all other information
access: from common light lock direct connection between rooms
acoustics: *Background Noise: NC/NRC 30* *Noise Isolation: STC 50*
finishes:
floor: vinyl composite tile (VCT)
walls: GWB
ceiling: exposed structure ; paint black
natural light: no requirement
outdoor access: no requirement
locks as per classroom locks
doors and frames Type A wood Statement of Requirements Section 6.7.6; Steel Frame Statement of Requirements 6.7.4

Services:

illumination: work lighting (LED 3000°K) track lighting above console - dimmed)
power: 3 - 120v/15amp ccts
communications: headset, telephone
data: no requirement
water: no requirement
drainage: no requirement
HVAC: as per audience chamber
other:

Notes:
Windows will be single glazing and be large (min 1m x 2m) and open by "sash" type counterweighted into cavity above. Operator must be able to see over an audience member standing in row immediately in front of the windows.

Lighting, sound & stage management control rooms are housed in same control room with pony walls (ht 1.5m) separating each area.

Track lighting fixtures shall be framing projectors (fixtures) to control light spill. Paint back wall Black & other walls mid-grey

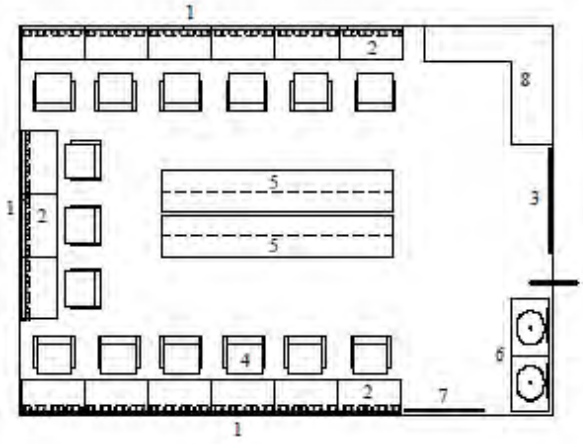
Provide universal barrier free access

All FF&E elements are to be in Category 1 per Appendix 1D Furniture, Fixtures and Equipment unless noted otherwise

Eric Hamber Secondary School Replacement

Group / Sub-Group:	Fine Arts - Auditorium	*Date*	
Space:	Dressing room (typical of 2)	*Room No*	14.008

Diagram:



Description:
Dressing room for 12 actors

Area: 37sm
Occupancy: 12

Elements:
1- mirror (1000mm ht) full length of counter with makeup lights & shelf (width: 300mm) above
2- counter with power outlets
3- bulletin board (1000 x 1200) Refer to 6.9.2 Sch 1 SoR
4- chairs (Category 3 per Appendix 1D)
5- wardrobe hanging space (2)
free standing - 3000mm (w) x 600 (d) x 1800 (Ht)
6- sinks in counter for make up with mirror above sinks
7- full length mirror (1 m x 2m)
8- storage cabinet built in
(1840 (H) x 1800 (w) X 410 (d)) (lockng)(1)

Other Elements
clock

Auditorium Systems (see Technical Section for min quantities

headset:	no
programme sound:	yes
lobby sound:	no
stage lighting Ethernet:	no
video:	no

Shell:
critical dimensions:
plan: to suit layout
ceiling height: 2.4m min
floor loading: Live Load: 4.8 kPa; refer to Schedule 1 – Statement of Requirements for all other information
access: form back of house corridor
acoustics:
Background Noise: NC/RC 30
Noise Isolation: STC 50
finishes:
floor: vinyl composite tile (VCT)
walls: GWB (surround at wall adjacent to sink cermanic tile)
ceiling: layed in panel acoustical ceiling
natural light: no requirement
outdoor access: no requirement
locks as per classroom locks
doors and frames Type A wood Statement of Requirements Section 6.7.6; Steel Frame Statement of Requirements 6.7.4

Services:
illumination: LED 3000°K overhead and over mirrors
power: outlets under mirrors @ 2m centres (2 outlets per circuit)
communications: no requirement
data: no requirement
water: in make up sinks
drainage: in make up sinks
HVAC: As per classrooms
other:

Notes:
There are no individual make up stations. There are long counters (24" d) with long horizontal mirrors and make up lights and shelf above. Modesty sightlines at entrances.

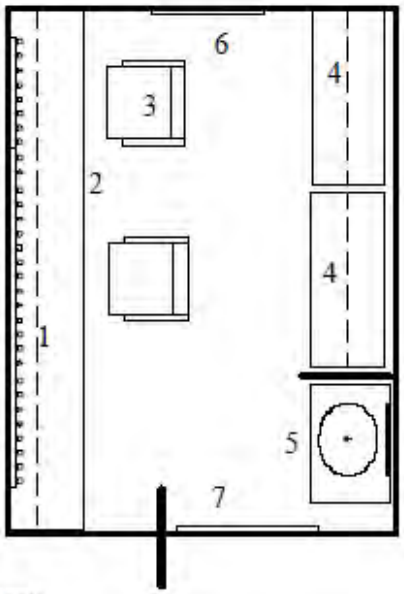
Provide universal barrier free access

All FF&E elements are to be in Category 1 per Appendix 1D Furniture, Fixtures and Equipment unless noted otherwise

Eric Hamber Secondary School Replacement

Group / Sub-Group:	Fine Arts - Auditorium	*Date*	
Space:	Dressing Room Small	*Room No*	14.010

Diagram:



Description:
Dressing room for 2 actors

Area: 11sm
Occupancy: 2

Elements:
1- mirror full length of counter with makeup lights & shelf above
2- counter with power outlets
3- chairs (2) (Category 3 per Appendix 1D)
4- wardrobe hanging space (2)
free standing - 3000mm (w) x 600 (d) x 1800 (Ht)
5- sink in counter for make up with mirror above
6- bulletin board (1000 x 1200) Refer to 6.9.2 Sch 1 SoR
7- full length mirror (1 m x 2m)

Other Elements
clock

Auditorium Systems (see Technical Section for min quantities

headset:	no
programme sound:	yes
lobby sound:	no
stage lighting Ethernet:	no
video:	no

Shell:
critical dimensions:
plan: to suit layout
ceiling height: 2.4m min
floor loading: Live Load: 4.8 kPa; refer to Schedule 1 – Statement of Requirements for all other information
access: from back of house corridor
acoustics:
Background Noise: NC/RC 30
Noise Isolation: STC 50
finishes:
floor: vinyl composite tile (VCT)
walls: GWB (surround at wall adjacent to sink cermanic tile)
ceiling: layed in panel acoustical ceiling
natural light: no requirement
outdoor access: no requirement
locks as per classroom locks
doors and frames Type A wood Statement of Requirements Section 6.7.6; Steel Frame Statement of Requirements 6.7.4

Services:
illumination: LED 3000°K overhead and over mirrors
power: outlets under mirrors @ 2m centres (2 outlets per circuit)
communications: no requirement
data: no requirement
water: in make up sinks
drainage: in make up sinks
HVAC: As per classrooms
other:

Notes:
There are no individual make up stations. There are long counters (24" d) with long horizontal mirrors and make up lights and shelf above. Modesty sightlines at entrances.

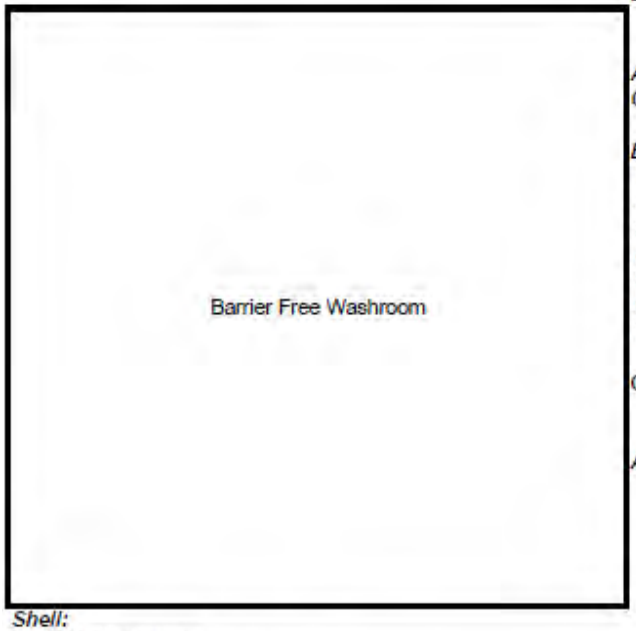
Provide universal barrier free access

All FF&E elements are to be in Category 1 per Appendix 1D Furniture, Fixtures and Equipment unless noted otherwise

Eric Hamber Secondary School Replacement

Group / Sub-Group: Fine Arts - Auditorium *Date*
Space: Gender Neutral Washroom *Room No* 14.011

Diagram:



Description:
Barrier free gender neutral washroom

Area: 5 sm
Occupancy: 1

Elements:
1- sink lavatory type mounted in counter mirror above sink
2- tiolet paper dispenser
3- sanitary napkin disposal
4- soap dispenser
5- air dryer
6- coat hook
7-

Other Elements

Auditorium Systems (see Technical Section for min quantities

headset:	no
programme sound:	yes
lobby sound:	no
stage lighting Ethernet:	no
video:	no

Shell:
critical dimensions:
plan: to suit layout
ceiling height: 2.4m min
floor loading: Live Load: 4.8 kPa; refer to Schedule 1 – Statement of Requirements for all other information
access: from back of house corridor
acoustics:
Background Noise: NC/RC 30
Noise Isolation: STC 50
finishes:
floor: vinyl composite tile (VCT)
walls: GWB (surround at wall adjacent to sink cermanic tile)
ceiling: GWB
natural light: no requirement
outdoor access: no requirement
locks as per VSB standard for WC
doors and frames Type A wood Statement of Requirements Section 6.7.6; Steel Frame Statement of Requirements 6.7.4
Services:
illumination: LED 3000°K overhead and over mirrors
power: 120v/15amp (1)- GFP
communications: no requirement
data: no requirement
water: for sink
drainage: for sink and floor drain
HVAC: exhaust fan; min temp 21°c
other:

Notes:
Provide universal barrier free access

All FF&E elements are to be in Category 1 per Appendix 1D Furniture, Fixtures and Equipment unless noted otherwise

4. DESIGN PRINCIPLES

4.1 General Design Principles

4.1.1 The Design-Builder will follow the below principles in their approach to the design of the Auditorium:

4.1.1.1 the Auditorium should provide a space which supports and enhances the creation of a performance by the performers and audience together;

4.1.1.2 the Auditorium should have good sightlines and acoustics;

4.1.1.3 design and technical decisions and considerations will support the idea that the Auditorium space is a tool used in the creation of a work of performing art, and that the performer may be an actor, musician or lecturer;

4.1.1.4 the audience will have sufficient room and space to feel comfortable and safe but without excessive space;

4.1.1.5 the design will place the audience where they can connect intimately with the performance and where they can see each other responding;

4.1.1.6 the audience chamber below the ceiling will be free of dark finishes and will exhibit a rich color palette;

4.1.1.7 the architecture should encourage a sense of excitement and community; and

4.1.1.8 the audience chamber will reflect the serious endeavors and respect of the work required to create the performing art.

4.1.2 The Design-Builder will demonstrate how they have addressed the design principles set out in Section 4.1.1 by providing to the Owner, prior to the design development phase (as described in Section 1(a)(2) of Appendix 2A [Submittals], Schedule 2 Review Procedure, the following:

4.1.2.1 written descriptions and colour renderings of the interior of the audience chamber;

4.1.2.2 colour renderings which include a plan, section and section showing the proscenium area; and

4.1.2.3 a sightline study including views from each row of each section.

4.1.3 The Design-Builder will also ensure that its design of the Auditorium:

4.1.3.1 addresses the need to support many different activities, not only traditional theatrical events but also non-theatrical activities as set out in Section 1.3.1 and Section 4.2.1.3;

4.1.3.2 allows flexibility of use and concurrent use of adjacent spaces to maximize use; and

4.1.3.3 is such that the venue and the technical facilities are safe, accessible, easily learned and able to be operated by students.

4.2 Auditorium Form and Layout

4.2.1 The Design-Builder will:

4.2.1.1 provide an Auditorium that is a classic proscenium auditorium with a seating capacity of 350, with control rooms above the seating;

4.2.1.2 ensure that the proscenium opening is a minimum of 11m wide and a minimum of 7m high;

4.2.1.3 accommodate in its design the multi-purpose use of the Auditorium, with flexibility to allow a variety of activities including drama productions, musical, dance, fashion shows, recitals, concerts, lectures and video presentations as well as non-theatrical events in the Auditorium;

4.2.1.4 ensure that the stage is wider than the audience chamber and has an acting area of 11m x 8.5m and a space for masking draperies on each side of the acting area of 3m x 8.5m. On each side of the stage, provide wings of 4.9m x 8.5m. Provide a pipe grid over the stage area;

4.2.1.5 ensure that the stage and back of house support spaces is contiguous with the first level without elevation change;

4.2.1.6 ensure that the stage is approximately 914mm above the floor of the first row of seating;

4.2.1.7 ensure that access to the stage from the audience chamber is barrier free;

4.2.1.8 provide 2 front of house lighting catwalks over the audience chamber, and determine the position of each catwalk by optimization of lighting angles to the stage from each catwalk;

4.2.1.9 coordinate the location of the catwalks with the acoustical reflector;

4.2.1.10 ensure catwalks are accessible from the control room, and that access can be secured when they are not in use;

4.2.1.11 ensure that the head room clearance is a minimum of 2300mm (including to any obstruction) on all areas of the catwalk which can be accessed by individuals;

4.2.1.12 design the Auditorium such that the audience can enter the Auditorium from the rear while the side entrances can be primarily for egress;

4.2.1.13 provide a control room suite at the rear of the audience chamber that is divided into 3 areas (lighting, sound and stage management) and has a “pony wall” between each control area. Provide a sound and light lock accessing the control room suite;

4.2.1.14 provide a stage apron that:

(a) is curved to match the audience seating layout downstage of the proscenium opening;

(b) has stairs on each side which allows access to the stage from the audience chamber; and

(c) has at its centre a depth of 3.5m downstage of the proscenium; and

4.2.1.15 ensure that side walls, rear walls and the area surrounding the proscenium arch:

(a) are subdued in colour but not black, containing the acoustical devices required to achieve the acoustical criteria provided in Section 4.7; and

(b) have architectural elements which will achieve the ambiance required to support performances.

4.3 Fire Separation

4.3.1 The Design-Builder is required to provide fire separation between the stage and surrounding spaces as required by the VBBL.

4.4 Forestage Acoustical Reflector

4.4.1 The Design-Builder will:

4.4.1.1 locate an acoustical reflector above the proscenium arch and between the proscenium and the 1st front of house catwalk;

4.4.1.2 ensure that the acoustical reflector covers the width of the proscenium; and

4.4.1.3 determine the shape and size of the acoustical reflector to meet the acoustical criteria in Section 4.7.

4.5 Seating

4.5.1 The Design-Builder will:

4.5.1.1 provide 350 fixed seats;

4.5.1.2 ensure each row has a minimum width of 950mm with a maximum rise of 320mm;

4.5.1.3 design seating to ensure optimum sightlines from each seat;

4.5.1.4 ensure aisles are stepped, covered with vinyl composite tile (VCT) and illuminated from aisle lighting fixtures located in the end panels of the seating;

4.5.1.5 provide two aisles dividing the seating into 3 sections and placing the highest seating capacity in the centre section;

4.5.1.6 provide accessible seating as per the VBBL; and

4.5.1.7 ensure that the seats, which will be Hussey Seating Quattro Classic Series (high back) or equivalent, have the following features:

(a) a robust long wearing fabric seat and back, standard G-grade fabric;

(b) plastic arms, seating pan and back of the back;

(c) end panels, row and seat numbering;

(d) aisle lighting built into the end panels; and

(e) tablet arms for student use will not be required.

4.5.2 It is desirable that seating rows will be curved to match the stage apron.

4.5.3 The Design-Builder will only provide seats that are 483mm (19”) wide if necessary to make rows end in an even line along an aisle, and only with prior approval by the Owner.

4.6 Over Stage Pipe Grid

4.6.1 The Design-Builder will:

4.6.1.1 provide has a pipe grid 1200mm above the proscenium arch (8200mm above the stage floor) of the stage;

4.6.1.2 ensure the pipe grid covers the acting area of the stage, the area allocated for masking (3000mm per side) and additional 1000mm on each side of the masking area;

4.6.1.3 ensure the grid extends from the proscenium wall to the rear wall of the stage;

4.6.1.4 lay out the pipes on 1500mm centres in the stage left/right direction and 1000mm in the up/down stage direction;

4.6.1.5 ensure all pipes are 1-1/2" schedule 40 pipe (49mm OD) and powder coated flat black;

4.6.1.6 ensure cross-over clamps are rated for the loads imposed and are “Mega Gridlock” by The Light Source or Model #015-100 by JR Clancy;

4.6.1.7 determine and ensure pipe grid loading based on the loads imposed by lighting equipment, video screen, drapery tracks and stage draperies as set out in this Appendix, with an additional allowance of 1000kg UDL. The grid will be supported from the bottom course of pipes;

4.6.1.8 provide a lamicoid sign 300mm x 300mm, permanently fixed in a prominent location on the stage wall stating the maximum UDL and point loads;

4.6.1.9 ensure that pipes have as few joints in their length as possible;

4.6.1.10 ensure joints are sleeve spliced with 600mm long sleeves with 300mm extending into each pipe, with each splice of 39.6875mm (1-9/16") OD seamless steel tubing with 3.175mm (.125") wall thickness, and the splices held in place by four (4) 3/8" bolts with nyloc nuts at right angles to each other, two (2) each side of the splice; and

4.6.1.11 alternate splices between rows of pipes.

4.6.2 The Design-Builder will ensure that all duct work and electrical devices are above the pipe grid.

4.7 Acoustics

4.7.1 The Design-Builder:

4.7.1.1 shall ensure that the acoustical criterion in the audience chamber strikes a balance between the use of the space for spoken word and music;

4.7.1.2 ensure that reverberation time is RT60 with a target of 1.1 to 1.2 seconds in the mid and high frequencies;

4.7.1.3 allow in the structure and head clearances for sufficiently large ductwork due to low background noise and low airflow;

4.7.1.4 will not use or provide rooftop fans directly above the audience chamber or stage;

4.7.1.5 comply with the design noise criteria of NC 25 in the audience chamber and stage; and

4.7.1.6 ensure maximum duct airflow in the audience chamber and stage is 1.5 m/s for supply and 1.8 m/s for return.

4.7.2 The Design-Builder will refer to the Statement of Requirements for the School's structural requirements.

4.7.3 The key acoustical issues to be provided by the Design-Builder are:

4.7.3.1 forestage acoustical reflector;

4.7.3.2 no rooftop fans, pumps and other mechanical equipment of any kind located within 5m of the audience chamber or stage;

4.7.3.3 sufficient distance to mechanical and electrical rooms from the audience chamber to achieve the NC criteria provided in this section;

4.7.3.4 allowance for large ducts which are required for low airflow noise as per the criteria provided above. All silencers will be located outside the audience chamber and stage and all ducts inside these space will be lined;

4.7.3.5 there will be no diffusers on the supply ducts in the audience chamber and stage, use only deflector plates;

4.7.3.6 no washrooms or plumbing located adjacent to the audience chamber or stage; and

4.7.3.7 vibration isolation of all equipment within 5m of the audience chamber and stage.

4.7.4 The Design-Builder acknowledges that the acoustical isolation of the audience chamber and stage from other spaces in the School is of the utmost importance to the Owner. An STC criteria of 50 is required. All entry doors located in the audience chamber where a sound and light vestibule is employed will have inside and outside doors with an STC rating of 35.

5. AUDITORIUM TECHNICAL SYSTEMS

5.1 Overview

5.1.1 This Section 5 outlines the following required Auditorium technical systems:

5.1.1.1 LED stage lighting system (fixtures and control);

5.1.1.2 house lighting control system;

5.1.1.3 stage lighting remote control system;

5.1.1.4 stage lighting Ethernet control system;

5.1.1.5 stage running light system;

5.1.1.6 Auditorium aisle lighting system;

5.1.1.7 sound and communications systems;

(a) production sound system;

(b) program sound system;

(c) lobby sound system;

(d) headset system; and

(e) assisted hearing system

5.1.1.8 video system

5.1.1.9 stage drapery system

5.2 LED Stage Lighting System (Fixtures and Control)

5.2.1 The Design-Builder will provide a complete LED stage lighting system that complies with the following:

5.2.1.1 distribution through 120v/20 amp circuits;

5.2.1.2 all receptacles shall be 120v/20 amp grounding twistlocks;

5.2.1.3 the circuit requirement for the Auditorium to be calculated at 48 – 20amp circuits with and anticipated load of 180 amps (60 amps/phase);

5.2.1.4 stage lighting circuits will be fed from ETC Echo Relay Panel or equivalent DMX control breaker panel, which panel will allow the operators to turn the LED fixture engines off remotely;

5.2.1.5 ensure that distribution of the stage lighting circuits for the front of house catwalk positions will be by plugging boxes (ETC Outlet Boxes or equivalent);

5.2.1.6 provide a minimum of six plugging boxes with three circuits each and as required to ensure proper distribution; and

5.2.1.7 ensure that there are 3 lighting pipes over the stage, which pipes will be on electrical hoists with the ability to lower them to working height (1100mm) on the stage deck. Distribution will be by plugging strips (ETC Connector Strips with 10 circuits each or equivalent) mounted on the pipes and fed from multi-conductor cable from the grid above. Allow enough multiconductor cable to re-locate the pipe up/down stage by 2000mm.

5.3 Audience Chamber Lighting System

5.3.1 The Design-Builder will provide for the audience chamber an LED lighting system, which complies with the following:

5.3.1.1 audience chamber fixtures will have the ability to do a smooth dimming curve from 0% to 100% without the LED flashing out/on at the bottom of the dimming curve. These fixtures are “dim to black” LED fixtures. Fixtures that dim to 1% are unacceptable;

5.3.1.2 fixtures that are acceptable and are designed for this application are (web addresses are provided for reference only):

(a) ArcSystem by ETC (www.etcconnect.com/Products/Lighting-Fixtures/ArcSystem);

(b) Chroma Q Inspire LED house light (www.chroma-q.com/products/inspire-led-house-light.asp);

(c) Chauvet Pro Ovation H-105WW (www.chauvetprofessional.com/products/ovation-h-105ww);

(d) Elation COLOUR PENDANT COLOUR-PENDANT Colour Pendant™ wash fixture (http://www.elationlighting.com/ProductDetails.aspx?ItemNumber=2049&MainId=1&Category=41); and

(e) Lightsource HL Series (www.thelightsource.com/products/hl-series-pendant-led-fixtures-134).

5.3.2 The Design-Builder will ensure that the LED audience chamber lighting fixtures may be controlled from the following locations and devices:

5.3.2.1 control room (lighting side) master station;

5.3.2.2 control room (stage management side) push button control station;

5.3.2.3 down stage right - push button control station;

5.3.2.4 down stage left - push button control station;

5.3.2.5 outlet in seating to accept a portable push button station; and

5.3.2.6 audience entrance - key operated station.

5.3.3 The Design-Builder will:

5.3.3.1 ensure that the audience chamber lighting may also be controlled by the stage lighting console;

5.3.3.2 ensure that the key switch station will override the show controls and immediately bring all the audience chamber lights to full intensity;

5.3.3.3 provide audience chamber lighting, with light levels and fixture locations to support the ambiance required for performances as well as educational activities and lectures;

5.3.3.4 connect general lighting in the audience entrance sound and light lock vestibules to the audience chamber lighting system; and

5.3.3.5 provide lighting in the sound and light lock at all times by providing step lights, wall mounted at 500 mm AFF, which are on 24/7.

5.4 Stage Lighting Remote Control System

5.4.1 The Design-Builder will provide a stage lighting remote control system that:

5.4.1.1 allows limited access to the stage lighting control system to call up stage lighting circuits on selected circuits for focusing or the running of selected lighting pre-sets; and

5.4.1.2 restricts access to the control room, the control console and to make stage lighting fixture focusing more efficient.

5.4.2 The Design-Builder will provide a wireless transmitter attached to an Ethernet hub located in the control room, which is able to connect the control console to an iPad. The Design-Builder is not responsible for providing the iPad.

5.5 Ethernet Control Circuits

5.5.1 The Design-Builder will:

5.5.1.1 provide a power over Ethernet control system for the control of stage lighting fixtures and other lighting accessories;

5.5.1.2 provide a control which is CAT 6 as specified by the lighting system manufacturer, and wired in direct (home) run terminating in an Ethernet hub located in the control room;

5.5.1.3 allow for 18 Ethernet connection points in the Auditorium and over stage; and

5.5.1.4 ensure that the DMX control system is facilitated by the use of Ethernet to DMX nodes located as required throughout the venue. Provide 10 nodes.

5.6 Auditorium Aisle Lighting

5.6.1 The Design-Builder will ensure that:

5.6.1.1 the Auditorium aisle lighting system is not controlled by the stage lighting system as the lights are considered a life safety requirement;

5.6.1.2 connect the power for the aisle lighting fixtures directly to a breaker or a dimmer located in an electrical room where access is restricted. As these fixtures will be on continuously throughout the year, the light source will be LED. Minimum light levels and area of floor coverage will be as per the VBBL; and

5.6.1.3 aisle lighting is mounted in the end panels of each seating row.

5.7 Exit Signage

5.7.1 The Design-Builder will:

5.7.1.1 provide exit signage as per the VBBL and which will never be dimmed or turned off; and

5.7.1.2 ensure that exit sign fixtures will control the amount of “spill” light and are located where they can be observed by the audience as required by VBBL with the least amount of interference to stage activities.

5.8 Performance Running Light System

5.8.1 The Design-Builder will:

5.8.1.1 provide a performance running light system that provides the low intensity lighting on the stage walls and wings during the running of performances, required to alleviate safety concerns as the back of house areas during a performance can be dangerous areas with cables, scenery and flying set pieces;

5.8.1.2 ensure that the location of lights, their intensity and the amount of spill light will be controlled so that there is no light seen by the audience;

5.8.1.3 provide dimmers and cowlings as required;

5.8.1.4 ensure the performance running light system uses the ETC Blues System or equivalent; and

5.8.1.5 ensure that fixtures will have a dimmable LED lamp.

5.9 Control Room Running and Work Lighting System

5.9.1 The Design-Builder will:

5.9.1.1 provide standard LED fixtures ceiling mounted for general control room lighting;

5.9.1.2 provide track lighting for control room running lights, used during performances, in accordance with the following:

(a) tracks will be mounted as close to the control room window as the window mechanism and the type of fixture used will allow, to ensure that the light is coming from in front of the control console and the amount of spill into the audience chamber is controlled;

(b) there will be 3 fixtures on each track which runs the full length of each window; and

(c) each track section will be controlled by a wall mounted dimmer; and

5.9.1.3 provide fixtures that:

(a) are matte black with a full range of pan and tilt controls; and

(b) are lamped with and LED lamp and have a barn door fitting on the front of the fixture to control light spill (Halo Model L734-MB-L1964 or equivalent).

5.10 Over Front of House Catwalk and Over Stage Pipe Grid Lighting

5.10.1 The Design-Builder will:

5.10.1.1 provide single tube LED tube fixtures with safety cages as work lighting;

5.10.1.2 space and locate such fixtures to meet VBBL safety requirements;

5.10.1.3 ensure that fixtures are mounted above head height on the catwalks;

5.10.1.4 provide a control point for the catwalk work lighting at the entrance to the catwalks and the control room;

5.10.1.5 locate over stage fixtures above the pipe grid and locate the control point for these fixtures on the proscenium wall near the entrance to the stage; and

5.10.1.6 provide fixture housings which are black in colour and locate the fixtures where the LED tubes cannot be seen by the audience.

6. SOUND AND COMMUNICATIONS SYSTEMS

6.1.1 This Section 6 outlines the following requirements:

6.1.1.1 sound system isolated ground;

6.1.1.2 production sound/play back system;

6.1.1.3 program sound system;

6.1.1.4 lobby sound system;

6.1.1.5 headset communication system; and

6.1.1.6 assisted hearing system.

6.1.2 The Design-Builder will locate the signal processing and other electronic equipment for all these systems in an equipment rack(s) in the control room.

6.2 Sound System Isolated Ground

6.2.1 The Design-Builder will:

6.2.1.1 provide a special isolated "technical" ground power supply for the audio systems;

6.2.1.2 ensure that all isolated sound circuits (120v/15amp) are supplied from the same main breaker panel which will be located centrally;

6.2.1.3 ensure isolated ground duplex outlets are red or orange in colour and clearly labelled “Isolated Ground Audio Only” and supply power as required, by the equipment supplied, to the audio rack in the control room;

6.2.1.4 ensure that the isolated ground is not connected to any of the building structure including steel frame structural members, conduit, water pipes or any other grounding source;

6.2.1.5 ensure that the building ground and the isolated ground is connected only through an isolation transformer directly to the insulated ground bus in the main building feeds;

6.2.1.6 connect all back boxes and panels used for the sound, communications and video systems to the building ground;

6.2.1.7 isolate the wiring in the boxes and panels from the building ground;

6.2.1.8 ensure that the isolation transformer is a faraday shielded isolation transformer;

6.2.1.9 install the isolation transformer outside the audience chamber and stage, at least 15 feet away from all power equipment and other transformers;

6.2.1.10 comply with total power requirements of 120 volt 3 phase feed of 60 amps;

6.2.1.11 verify that the isolated ground system is not connected to the building ground by disconnecting the isolated ground system at the main panel, before the sound and communications systems are installed. At this point an open circuit greater than 1 mega-ohm should be measured between the isolated ground and the building ground; and

6.2.1.12 locate isolated ground circuits in various locations in the Auditorium wherever sound equipment will be installed or used occasionally. Allow for a minimum of 20 locations.

6.3 Production Sound System

6.3.1 The Design-Builder will:

6.3.1.1 provide a production sound system that provides the means to create sound effects, re-enforce sound coming from the stage and to play back sound effects, consisting of a mixing console and related signal processing including such things as amplifiers, patch fields, CD player and other signal processing equipment;

6.3.1.2 locate all of the production sound system equipment in the control room;

6.3.1.3 locate the 12 limited analog microphone lines and 12 speaker lines throughout the Auditorium;

6.3.1.4 ensure that each circuit has a home run from its connector to the sound rack;

6.3.1.5 ensure all speakers are self-powered;

6.3.1.6 locate isolated ground circuits as required within 3m from anticipated speaker locations;

6.3.1.7 provide a digital network:

(a) to facilitate the distribution of microphones and speakers throughout the Auditorium;

(b) with Cat6 cabling;

(c) with circuits that are home run from a minimum of 6 locations terminating in the audio equipment racks in the control room; and

(d) with stage boxes used to connect microphones and speakers to the digital console;

6.3.1.8 provide a main front of house speaker system that is a left/right/centre system with 2 subwoofers;

6.3.1.9 locate a speaker at the proscenium and provide even coverage throughout the audience chamber (Manufacturer: Meyer, Lacoustics, EAW, Outline); and

6.3.1.10 provide Ease (Enhanced Acoustic Simulator for Engineers) drawings of the system demonstrating coverage.

6.4 Program Sound System

6.4.1 The Design-Builder:

6.4.1.1 will provide a program sound system that:

(a) takes the sound from the stage via two microphones mounted on the first front of house catwalk in the audience chamber and routes it to

backstage locations, such as the dressing rooms, control rooms and corridors, allowing people in these spaces to hear what is happening on stage;

(b) allows paging from the control room and backstage to those areas;

(c) has volume control for each of the program sound speakers will have a volume control allowing the sound level to be controlled in each area; and

(d) has a relay to override the volume control and bring a page in at a predetermined level no matter where the volume controls have been set.

6.4.1.2 will ensure that the input for the system is provided by two microphones mounted on the first front of house catwalk, and that these microphones are also used to supply the signal for the assisted hearing system;

6.4.1.3 locate page microphones, which shall be the “push to talk” style, in the control room and downstage by proscenium;

6.4.1.4 locate program sound speakers in all the back of house spaces;

6.4.1.5 surface-mount speaker baffles at 2100mm over a single gang utility box which contains the cable;

6.4.1.6 mount volume controls and privacy switches will be mounted on the bottom of the baffles unless indicated otherwise by the Owner or manufacturer; and

6.4.1.7 provide a minimum of 10 speaker/baffles in the back of house locations.

6.5 Lobby Sound System (School Commons)

6.5.1 The Design-Builder will provide a lobby sound system, which is similar to the program sound system and feeds sound into the lobby (School Commons) from several potential sources including:

6.5.1.1 pre-recorded music and effects from the mixing console;

6.5.1.2 show feed from the program sound system; and

6.5.1.3 pages from the control room.

6.5.2 The Design-Builder will ensure that in addition to the uses set out in Section 6.5.1, the lobby sound system may also be used as a lobby call system warning the audience the show is about to begin.

6.5.3 The Design-Builder will:

6.5.3.1 mount speakers in various locations in the School Commons to achieve an even coverage;

6.5.3.2 provide and locate a page microphone, which will be “push to talk” style, in the control room (on audio rack); and

6.5.3.3 allow for a minimum of 6 locations.

6.6 Headset Communications System

6.6.1 The Design-Builder will provide a headset communications system, to be used by the Auditorium running crew to communicate to each other during performances and rehearsals.

6.6.2 The Design-Builder:

6.6.2.1 will ensure that the system consists of a power supply and number of headset outlets distributed throughout the Auditorium. In order to use the system a technician connects a headset to a belt pack (transmitter/receiver) which is in turn connected to a wall outlet;

6.6.2.2 will provide a two channel system with 6 headset/belt pack units (Clearcom or equivalent);

6.6.2.3 will provide headset inputs in 12 locations the back of house and control rooms; and

6.6.2.4 may provide a wireless system as an alternate.

6.7 Assisted Hearing System

6.7.1 The Design-Builder will provide an assisted hearing system that takes the sound from the stage and processes it through an infrared emitter. The audio signal will be modulated on the infrared transmissions and the hearing impaired members of the audience, through the use of a receiver and headset, can listen to the performance.

6.7.2 The Design-Builder will:

6.7.2.1 locate the electronics in the audio rack in the control room and the input signal will be from the two microphones used for the program sound system;

6.7.2.2 mount two emitters on each side of the proscenium arch close to the stage.; and

6.7.2.3 ensure sufficient emitters are provided to cover the entire audience chamber.

7. MISCELLANEOUS CIRCUITRY

7.1 Power Disconnects

7.1.1 The Design-Builder will:

7.1.1.1 provide a power disconnect panel for the connection of equipment which may require a large power source, and this equipment may include welders, projection equipment, motors, other stage machinery and equipment to support small touring shows. This power source will be used on an occasional basis.

7.1.1.2 ensure that all panels are locked to limit access;

7.1.1.3 locate the panel up stage left; and

7.1.1.4 provide a 100 amp-3 phase fusible disconnect switch.

7.2 Fire Alarm Connections and School Emergency Paging

7.2.1 The Design-Builder will:

7.2.1.1 ensure that as required by the VBBL, stage lighting and house lighting come to full intensity upon activation of the fire alarm;

7.2.1.2 ensure that the sound system will be muted:

(a) upon activation of the fire alarm as the sound system is not designed for life safety operation; or

(b) on the activation of the School emergency paging system.

7.3 Video System

7.3.1 The Design-Builder will provide a video system that serves the following functions:

7.3.1.1 facilitate archival recording of stage performances; and

7.3.1.2 video/data projection onto a screen positioned at the proscenium line.

7.3.2 The Design-Builder will:

7.3.2.1 provide a HD video system; and

7.3.2.2 provide for the connection of a computer in the sound control room and down stage right and down stage left.

7.3.3 The School network connection will be supplied to the video system in the audio rack. In addition, there will be an internet connection in the audio rack in the control room. The Owner will set up these systems.

8. AUDITORIUM TECHNICAL EQUIPMENT

8.1 General

8.1.1 The Design-Builder will provide the Auditorium technical equipment which will include all necessary components to make the Auditorium operate in a manner in keeping with professional and educational standards.

8.1.2 The equipment lists in the following sections are provided to demonstrate the typical equipment which the Owner expects will be purchased. The Design-Builder will develop their electrical and other base building infrastructure on the basis of this equipment. However, as described in Section 5.12 (Equipment Logistics Schedule) of Appendix 1D [Furniture, Fixtures and Equipment], the Owner intends to take advantage of the most recent technological advances and will make their decision on the selection of specific equipment 8 to 10 months before the Facility is open. If the resulting equipment selection affects the Work, the Change provisions of the Agreement will be followed.

8.2 Stage Lighting Equipment (equipment as listed or approved alternative)

8.2.1 The Design-Builder will provide:

8.2.1.1 Control Console - ETC Element 2 with wireless interface, digital network and house lighting control;

8.2.1.2 House lighting control and Ethernet control systems;

8.2.1.3 Ellipsoidal Spotlights - Fixtures by ETC LED Colour Source

(a) 12 – 19 degree ETC LED Colour Source

(b) 18 – 36 degree ETC LED Colour Source

(c) 12 – 50 degree ETC LED Colour Source

8.2.1.4 Fresnel fixtures

(a) 20 - Elation Fuze Par Z175 175W RGBW COB LED 8° to 35° zoom 3/5pin DMX, PowerCON in/out.

(b) Included with each fixture:

(i) Barn Doors,

(ii) 5ft PowerCon to 15Amp Edison© input cord,

(iii) Gel Frame

(iv) Black safety cable with high quality clip

(v) C-clamp

8.2.1.5 Cyclorama Lights

(a) 6 – ETC Linear 4 (with yokes, C-clamps, safety cable, 5 PowerCon to 20amp TLG, PowerCon jumpers as required, 28 – narrow linear lens)

8.2.1.6 Moving Lights

(a) 4 – i-Cue Intelligent Mirrors with power supply

8.2.1.7 Portable Dimmers: 2 single ETC - ES750 portable dimmers

8.2.1.8 DMX Nodes: 10 Ethernet/DMX ETC Net 3 nodes

8.2.1.9 Cable: power extension cords, PowerCon interconnecting cable and DMX/Network cable in quantities to make the lighting system operate.

8.3 Stage Sound Equipment (equipment as listed or approved alternative)

8.3.1 The Design-Builder will provide:

8.3.1.1 Control:

(a) Allen and Heath SQ6 Digital Console and accessories;

(b) Allen and Heath DX168 I/O Stage Box (2);

(c) Network Switch with patch panel (1);

(d) SQ MixPad App and Wireless Router (Apple iPad supplied by Owner);

(e) Stereo Headphones (Sennheiser HD-280-PRO)(1);

(f) Compact Disc Player/Writer (2) (Tascam CD-RW-900MKII);

(g) Splay Cables, Jack fields, Patch Cords as required;

(h) iPad interface (iPad provided by the Owner); and

(i) Equipment Rack(s) as required.

8.4 Front of house Speaker System

8.4.1 The Design-Builder will provide left/right/centre front of house proscenium speaker system with 2 subwoofers. Speaker will provide even coverage throughout the audience chamber. (Manufacture: Meyer, Lacoustics, EAW, Outline)

8.5 Sound System Loose Equipment

The Design-Builder will provide:

8.5.1 Speakers

8.5.1.1 QSC KW122 powered speakers (2).

8.5.1.2 Loudspeaker Extension Cables (as required).

8.5.2 Microphones & Accessories

8.5.2.1 Shure model Beta 58A and Accessories (6).

8.5.2.2 Shure model Beta 57A and Accessories (4).

8.5.2.3 Microphone Stands (10).

8.5.2.4 Microphone Extension Cables (as required).

8.5.2.5 Low voltage wire and cable and installation.

8.6 Lobby Sound, Program Sound, Headset, Assisted Hearing Equipment

8.6.1 The Design-Builder will provide:

8.6.1.1 Equipment as detailed in above in Sections 6.4 to 6.7.

8.6.1.2 Low voltage wire and cable and installation.

8.7 Video System (equipment as listed or approved alternative)

8.7.1 The Design-Builder will provide:

8.7.1.1 Crestron control system to allow the video system to be controlled from stage level and control room. The Crestron control system which will:

(a) turn the projector on/off;

(b) projector electronic dowser;

(c) select the video input; and

(d) control audio level;

8.7.1.2 digital 10,000 ANSI lumen laser projector (with electronic dowser, lens memory);

8.7.1.3 Digital Zoom Lens with ability to project from a front of house catwalk position to a screen located downstage of the main drape as well as the cyclorama at the rear of the stage;

8.7.1.4 applicable projector mount;

8.7.1.5 applicable cables;

8.7.1.6 an electric roll up projection screen with viewing area applicable for the audience size and viewing distance, matt white screen surface, two wireless IR remotes, black case, Extra drop of black fabric required making the bottom of the image 2200mm above the stage floor;

8.7.1.7 an input from a computer on stage level and in the control room;

8.7.1.8 a connection between the video system and the Auditorium sound system;

8.7.1.9 for 2 control panels located on the stage left wall and in the control room;

8.7.1.10 a Blu-ray player; and

8.7.1.11 low voltage wire and cable and installation.

8.8 Stage Draperies

8.8.1 The Design-Builder will provide:

8.8.1.1 main drape (coloured to compliment audience chamber) (50% fullness);

8.8.1.2 main drape valance (coloured as main drape) (50% fullness);

8.8.1.3 legs (3 pairs) (black);

8.8.1.4 borders (3) (black);

8.8.1.5 traveler (1) black(50% fullness);

8.8.1.6 cyclorama (filled scrim) (1) (white;)

8.8.1.7 main drape track (bi-part);

8.8.1.8 travel track (bi part);

8.8.1.9 leg tracks (short) (6) (walk along); and

8.8.1.10 cyclorama track (straight) (walk along) (used for storage).

8.8.2 The Design-Builder will provide layout draperies to completely mask (in ballet format) the stage wings from the audience.

8.9 Drapery Fire Safety

8.9.1 The Design-Builder will ensure that:

8.9.1.1 all draperies provided conform to all applicable national, provincial and local VBBL requirements and with industry standards of operation and practices;

8.9.1.2 all materials, arrangements and procedures related to drapery comply with all applicable fire VBBL; and

8.9.1.3 all drapery material is inherently flame retardant in accordance with the following:

(a) National Fire Prevention Association - NFPA-701 Small & Large Scale

(b) Canadian Government Specifications Board (VERTICAL TEST) CAN ULC S-109 1987 AND CAN 2-4.2 - M77 Method 27.1.

8.9.2 At the time of commissioning, the Design-Builder will demonstrate that the drapery fabric provided and used is flame retardant by way of on-site flame test (the National Fire Prevention Associations (NFPA) 701 Small Scale Flame Test, commonly referred to as the “match test”).

8.9.3 The Design-Builder will ensure that on the back of each drapery in the bottom right hand corner, there will be a permanently sewn fabric label (minimum 50mm ht x 75mm w) that includes the following information:

8.9.3.1 the drapery suppliers name and telephone number;

8.9.3.2 the date of fabrication; and

8.9.3.3 the fabric supplier and the date the fabric was flame retardant.

8.9.4 The Design-Builder will ensure that each drapery piece will have an approximately 76mm X 76mm tab or flap of the fabric sewn into the bottom right hand corner of the back of each drapery. This flap will be located adjacent to the label certifying that the drape is flame proofed, and will be available to be used for random flame testing pursuant to Section 8.9.2.

8.9.5 The Design-Builder will provide, or cause to be provided by the drapery supplier, with the “as built” drawings, plots and maintenance manuals a “Certificate of Flame-Proofing”, signed and sealed by the fabric manufacturer, for each piece of drapery supplied.

8.10 Drapery Manufacture

8.10.1 The Design-Builder will ensure that all drapery fabric is a minimum of 20oz IFR velour.

8.10.2 The Design-Builder will supply draperies:

8.10.2.1 which are constructed in accordance with good stage drapery manufacturer's practices;

8.10.2.2 which are free of puckered seams, loose threads and other defects;

8.10.2.3 with each width of material that extends the full height of the curtain;

8.10.2.4 that do not have panels less than one half panel in width;

8.10.2.5 that do not have cross-seaming;

8.10.2.6 with hems that are lock-stitched with matching thread, and all exposed fabric edges which are not selvage edges serged;

8.10.2.7 which are free of flaws such as voids, shading or other damages;

8.10.2.8 that are constructed of fabric from the same dye lot if of the same colour;

8.10.2.9 with no shading or toning differences in adjacent panels or drapes;

8.10.2.10 with the natural nap of fabric on all panels, of all drapes, running in the same direction; and

8.10.2.11 which nap will run down.

8.10.3 The Design-Builder will ensure that the draperies conform to the following requirements:

8.10.3.1 heading to have a 89mm turnover sewn to 89mm heavy jute webbing with #4 brass spur grommets 304mm on centre with and 19mm from the top of the drape starting and finishing 10mm from the vertical edges of the header;

8.10.3.2 centre overlap (where applicable) to have 1/2 panel width of fabric turned back with 51mm turn under;

8.10.3.3 side hems to have 76mm turn back with 51mm turn under;

8.10.3.4 bottom hem to be 152mm turn back with 76mm turn under, and have 102mm canvas chain pocket containing #8 Jack Chain anchored at each end;

8.10.3.5 pocket ends to be sewn closed to prevent the chain from escaping; and

8.10.3.6 the chain to ride 51mm above bottom of the curtain.

8.11 Drapery Installation

8.11.1 The Design-Builder will:

8.11.1.1 fix the drapery track and pipe battens to the pipe grid by means of chains, which chains shall be graded welded chain rated for the loads; and

8.11.1.2 fix draperies and other soft goods which are not hung on tracks to pipe battens by 19mm wide twill tape which are in turn fixed to the pipe grid.

8.12 Stage Rigging

8.12.1 The Design-Builder will:

8.12.1.1 provide 3 stage lighting pipes on electric hoists which will allow the lighting pipes to be lowered to the stage floor to load stage lighting fixtures;

8.12.1.2 provide cable management, control console on stage level (password protected), power feeds, plugging strips;

8.12.1.3 provide stage lighting pipes with length of 19m and the payload of 1200lb;

8.12.1.4 locate over stage to facilitate 1st onstage lighting pipe, mid stage and cyclorama; and

8.12.1.5 provide ETC Prodigy P1 Fixed Speed hoists or equivalent.

8.12.2 The Design-Builder will secure the hoists to the building structure and hang in the high trim below the pipe grid and close to the pipe grid as possible.

Appendix 1J(A)
Auditorium Cash Allowance

Division of Budget- Stage Lighting System

Item	Base Building	Cash Allowance
Stage Lighting Control		
Control Console		X
120v Ac For Console	X	
Power Over Ethernet System/DMX System		X
Ethernet Control Cable	X	
Remote Stations		X
Wireless Control Systems		X
Track Light & Dimmers in Control Rms	X	
Connectors And Plates (low voltage only)		X
House Lighting Control		
House Light Master Control		X
House Light Remote Stations		X
House Light Control Cable	X	
Connectors And Plates (low voltage only)		X
DMX Control of Stage Lighting Circuits		
DMX Controlled Breaker Panel		X
Installation of DMX Controlled Panel	X	
Distribution		
Main Power Disconnects for Breaker Panel	X	
Wire/Disconnect To Panel	X	
Load Circuits To Stage Lighting Fixtures	X	
House Light Load Circuits To Fixtures	X	
Emergency House Lighting Circuits	X	
Emergency House Light Transfer Switches	X	
Utility Boxes	X	
Plug-in Boxes	X	
On-stage and FOH Raceways	X	
Receptacles And Cover Plates (120v)	X	
Circuit Numbers	X	
Company Switches and Disconnects	X	
Back of House Blue Running Lights	X	
Wire, Installation	X	
Conduit, Wireways, Wiring Devices	X	
Lighting Fixtures		
Stage Lighting LED Fixtures		X
House Light LED Fixtures	X	

Division of Budget
Sound and Communications Systems

Item	Base Building	Cash Allowance
Equipment		
Control Console		X
Cd/Tape Players		X
Signal Processing		X
Microphones, Loose Equipment		X
Equipment Racks		X
Microphones		X
Power Amplifiers		X
Loudspeakers		X
Headset System		X
Program Sound/Paging		X
Lobby Sound/Paging		X
Racks, Cases and Cabinetry		X
Distribution		
Sub-Panels	X	
Special Grounding, Wire & Connections	X	
Special Isolated Ground 120 V Circuits	X	
Connection Equip Racks To 120V Service		X
Utility Boxes	X	
Connections And Plates - Low Voltage		X
Connections And Plates - 120 V ++	X	
Cable, Wire And Wire Installation		X
Conduit, Wire ways, Wiring Devices	X	

Division of Budget - Video Systems

Item	Base Building	Cash Allowance
EQUIPMENT		
Cameras		X
Blu-ray Player		X
Video Recorders		X
Video Projector		X
Video Projector Mount		X
Monitors		X
Monitor Mounting Hardware		X
Projection Screen		X
Video Connection Points		X
Crestron Control Systems		X
Equipment Racks (if required)		X
DISTRIBUTION		
Electrical Sub-panels	X	
Special Grounding, Wire & Connection	X	
Power for Monitors	X	
Power for Screen	X	
Control Cable for Motorized Screen	X	
Connection Equip Racks to 120 v Service		X
Utility Boxes	X	
Connections and Plates - Low Voltage		X
Connections and Plates - 120 v ++	X	
Low Voltage Wire and Wire install		X
Conduit, Wire ways, Wiring Devices	X	

Division of Budget - Pipe Grid and Catwalk Systems

Item	Base Building	Cash Allowance
Over stage pipe grid	X	
Front of house catwalks	X	
Access Catwalks	X	
Motorized Rigging for stage lighting pipes		X
Electrical supply for motors	X	
Electrical supply for lighting circuits	X	
Cable management for lighting Circuits		X

Division of Budget - Stage Drapery System

Item	Base Building	Cash Allowance
Drapery tracks		X
Stage Draperies		X

SCHEDULE 2

REVIEW PROCEDURE

1. SUBMITTAL SCHEDULE

1.1 The parties agree that the preliminary schedule for Submittals (the "**Submittal Schedule**") is included in the Proposal Extracts and will conform to the requirements identified in Section 16 of the Agreement. The Submittal Schedule may be amended by agreement of the parties in accordance with the terms of this Section 1. Any amendment to the Submittal Schedule will provide for a progressive and orderly flow of Submittals from the Design-Builder to the Owner as appropriate to allow sufficient time for review of each Submittal by the Owner, taking into account both the resources necessary to be available to the Owner to conduct such review and any user group consultations.

1.2 Unless a longer period is required by this Agreement or is otherwise reasonably required by the Owner, the Submittal Schedule will allow a minimum of 15 Business Days for the Owner's review of Submittals submitted in relation to the Design pursuant to this Schedule, from the date of receipt for review of and response to each Submittal, provided that if the Design-Builder has made major changes to the grouping and volume of Submittals, such period of time will be adjusted, acting reasonably, taking into account the factors set forth in this Section 1.

1.3 The Design-Builder will, in scheduling Submittals and in the performance of the Design and the Construction, allow adequate time prior to performing the Design and the Construction that are the subject of the Submittals, for review of the Submittals and for the Design-Builder to make changes to the Submittals, the Design and the Construction that may be required if comments are received on the Submittals.

1.4 If the Submittal Schedule indicates that a large number of Submittals will be made at one time, the Owner may request a longer period for review or a staggering of the Submittals, and the Design-Builder will revise the Submittal Schedule accordingly, taking into account both the availability of resources required by the Owner to conduct such review and whether delay in the review of the subject matter of the Submittal will have a material impact on the Design-Builder's ability to progress future anticipated Submittals and the Design or Construction in accordance with the Time Schedule.

1.5 The Design-Builder will submit the Submittal Schedule, including amendments prior to the start of Construction and, subsequently, to the Owner on a monthly basis until Substantial Completion is achieved.

1.6 All amended Submittal Schedules will be required to meet all the requirements of this Section 1.

1.7 The Design-Builder will submit all Submittals to the Owner in accordance with the current amended Submittal Schedule.

1.8 The Design-Builder will bear the risk of delays and additional costs caused as a result of the late submission of Submittals to the Owner, by Submittals which are rejected and required to be re-submitted in accordance with the terms of this Schedule 2 – Review Procedure, or by changes in the Design and Construction required as a result of comments made pursuant to this Schedule 2 – Review Procedure.

2. GENERAL REQUIREMENTS FOR SUBMITTALS

2.1 Unless otherwise specified by this Agreement or by the Owner, the Design-Builder will issue an electronic copy of each Submittal in .pdf format or other format agreed by the parties acting reasonably. Unless otherwise required by this Agreement or by applicable Law to be signed or sealed at the time the Submittal is first provided to the Owner, upon assignment of the comment "REVIEWED" by the Owner of each Submittal the Design-Builder will issue a paper copy (or an electronically sealed copy if agreed by the Owner) of the Submittal that has been sealed by the Design-Builder's Consultant as required by Section 2.4 below.

2.2 The Design-Builder will compile and maintain a Submittal log that includes the date, contents and status of the submission of all Submittals, including the date, contents and status of the submission of all Submittals, including the date of receipt and content of all returned Submittals and comments thereon.

2.3 All Submittals will be in English.

2.4 All Submittals, and all amended versions of Submittals, required by this Agreement or by applicable Law to be signed or sealed by persons with professional designations (including where applicable by registered professional architects or engineers) will be so signed and, where applicable, sealed, and will include confirmation by such person or persons that the Work proposed by the Submittal meets the requirements of the Agreement, including the Statement of Requirements.

2.5 All Submittals will include all documents to be reviewed and will clearly identify the purpose of the Submittal, the Design-Builder's proposed course of action relating to the Submittal and the Design and the Construction that are the subject of the Submittal.

2.6 All Submittals will refer to the relevant provisions of Schedule 1 – Statement of Requirements and to any matter that has previously been subject to review. All Submittals will:

(a) be clearly identified as a Submittal and will be delivered with appropriate covering documentation, which will include a list of all attached Submittals and for each Submittal the document number(s) or drawing number(s);

(b) include revision numbers (if applicable);

(c) include document or drawing title(s);

(d) include name of entity that prepared the Submittal;

(e) include details of the Submittal log showing date and delivery information and/or log number of all previous submissions of that Submittal; identification of any previous Submittal superseded by the current Submittal, and a description of the portions of the Submittal that are the subject of review.

3. COMMENTS

3.1 The Owner will review and respond to each Submittal in accordance with the applicable time periods for the Submittal.

3.2 The Owner will return Submittals to the Design-Builder and assign one of the following 3 comments:

(a) "REVIEWED";

(b) "CORRECT DEFICIENCIES"; or

(c) "REJECTED".

3.3 The comment "REVIEWED" will be assigned to those Submittals that, in the opinion of the Owner, acting reasonably, conform to the requirements of this Agreement. The Design-Builder will comply with and implement such Submittals.

3.4 The comment "CORRECT DEFICIENCIES" will be assigned to those Submittals that, in the opinion of the Owner, acting reasonably, generally conform to the requirements of this Agreement, but in which minor deficiencies have been found and identified by the Owner's review. The Design-Builder will, to the extent necessary, correct these Submittals and provide a copy of such Submittals to the Owner before the Design-Builder implements the portions of such Submittals that have received comments, but may proceed on the portions of such Submittals that have not received comments. The Design-Builder will comply with and implement such corrected Submittals. If at any time it is discovered that the Design-Builder has not corrected the deficiencies on Submittals that were correctly stamped "CORRECT DEFICIENCIES", then the Design-Builder will be required to modify the Submittals, the relevant Design and the Construction as required to correct the deficiencies and the Design-Builder may be required, at the Owner's discretion, acting reasonably, to resubmit relevant Submittals.

3.5 The comment "REJECTED" will be assigned to those Submittals that, in the opinion of the Owner, acting reasonably, contain significant deficiencies or do not conform with the requirements of this Agreement, including this Schedule 2 – Review Procedure. The Design-Builder will correct and re-submit these Submittals within 10 Business Days after the comment has been provided to the Design-Builder. The Owner will then review such corrected Submittals and assign a comment to the corrected Submittal. The Submittals will be corrected, revised and resubmitted as often as may be required to obtain a comment that permits the Design-Builder to proceed. Except with the written consent of the Owner, the Design-Builder will not proceed with any Design or Construction to which such Submittals receiving the comment "REJECTED" relate until the Design-Builder obtains a comment that permits the Design-Builder to proceed.

3.6 The Owner may request additional time for the review of any Submittal, including where the Submittal is voluminous or requires extensive review by representatives (including consultants) of the Owner, and the Design-Builder will extend such time for any reasonable requests by the Owner.

3.7 If the Owner does not respond to a Submittal within the applicable time periods for the Submittal, the Submittal will be deemed "REVIEWED" and the Design-Builder may proceed with and implement the Design and the Construction on the basis set forth in the applicable Submittal without any further action or documentation required.

3.8 Where the Owner issues the comment "CORRECT DEFICIENCIES" or "REJECTED", the Owner will provide reasons for the comment, referencing the particulars of the Section(s) of the Agreement (including the Statement of Requirements) that the Submittal fails to satisfy.

3.9 If at any time after assigning any comment to a Submittal or where Section 3.7 of this Schedule has applied, the Owner or the Design-Builder discovers deficiencies or any failure to conform to the requirements of this Agreement, the Owner may revise the comment assigned to any Submittal. If the parties agree or it is determined in accordance with Section 62 (Dispute

Resolution) of the Agreement that the revised comment is correct, the Design-Builder will make all such corrections to the Submittals and the Design and the Construction.

3.10 For the purpose of facilitating and expediting the review and correction of Submittals, the Owner's Representative and the Design-Builder's Representative will meet as may be mutually agreed to discuss and review any outstanding Submittals and any comments thereon.

3.11 In lieu of returning a Submittal, the Owner may by letter notify the Design-Builder of the comment assigned to the Submittal and if such comment is "CORRECT DEFICIENCIES" or "REJECTED" the letter will contain comments in sufficient detail for the Design-Builder to identify the correction sought.

4. USER CONSULTATION PROTOCOL

4.1 The Design-Builder acknowledges that review of the Design by the Owner and consultation with the Facility users is an essential step in the completion of the detailed design of the Facility. Accordingly, the Design-Builder will conduct consultations with representatives of the Facility users (the "**User Consultation Groups**") as described in this Schedule 2. The Owner will make reasonable efforts, as requested by the Design-Builder, to assist and support the Design-Builder with the consultation process, but nothing in this Section 4 will be interpreted to give the Owner responsibility for the Design, the Design schedule or the user consultation process.

4.2 The Owner will establish User Consultation Groups that may include the Owner, the Owner's Representatives, employees, agents, contractors and subcontractors, staff, visitors, students and volunteers. The Owner may also from time to time include families and neighbours in the user consultation process.

4.3 Unless agreed by the Owner, all aspects of the Design will be subject to review by one or more User Consultation Groups.

4.4 The User Consultation Groups consist of three separate groups:

(i) "Core User Group" consisting of Owner staff with responsibility for coordinating the Design review process with the Design-Builder;

(ii) "School Staff Group" consisting of School administration, department heads and other teachers and staff, as required, at the discretion of the Owner; and

(iii) "City Childcare Group" consisting of staff from the City of Vancouver responsible for the development of the Childcare Centre in the Facility.

4.5 Unless otherwise agreed, Submittals will be provided and reviewed in accordance with the following:

(a) Submittal to the Owner:

(i) The Design-Builder will provide a Submittal as indicated on the Submittal Schedule that includes all relevant material with a covering transmittal indicating the purpose of the Submittal, and the information that should be reviewed by the Owner and the User Consultation Groups. The covering transmittal will indicate if there is an area that the Design-Builder does not want the Owner to review at the moment, based on the Design-Builder's progress to date.

(ii) All changes from a previous Submittal should be clearly indicated in accordance with Section 8 of this Schedule 2.

(b) User Consultation Group:

(i) 5 Business Days following the Submittal, the Design-Builder will present the relevant material at a meeting of the relevant User Consultation Group(s).

(ii) The presentation will be made in person by the Architect and the Design-Builder's consultants relevant to the contents of the Submittal, who are prepared to respond to questions related to the Submittal.

(iii) The Design-Builder's presentation will include a page-by-page review of the Submittal.

(iv) The Design-Builder must be in attendance, preferably in person but teleconference is acceptable.

(v) During the presentation, a representative of the Design-Builder will take "live minutes" so that all parties can agree on the content of the minutes during the meeting. The Design-Builder will circulate the minutes immediately after the meeting to all parties and within 3 Business Days the Design-Builder must circulate formal minutes for review. If the Owner notifies the Design-Builder of any errors in the minutes, the Design-Builder will correct such errors within 3 Business Days of the Owner's notice.

(vi) During the presentation, the Owner may seek clarifications and ask questions and will provide any informal feedback through to the Design-Builder.

(c) Response from the Owner:

(i) The Owner will respond within 15 Business Days starting the Business Day after the presentation in accordance with this Schedule 2.

4.6 The process set out in this Section 4 will be set out in the Submittal Schedule.

4.7 The parties acknowledge that Design development is an iterative and interactive process and that additional User Consultation Group review and meetings may be required from those shown on the Submittal Schedule. The Design-Builder will be required to incorporate these additional User Consultation Group meetings into their Time Schedule. The parties will co-operate to amend the Submittal Schedule as may be required from time to time to ensure that sufficient consultations with the User Consultation Group in relation to each component of the Design (and changes to the Design resulting from such consultations) are completed prior to the Design-Builder making the formal Submittal.

4.8 The Owner and the Design-Builder will not be bound by the consultations with the User Consultation Groups, unless reflected in the formal Submittal and comments from the Owner.

4.9 If the Design-Builder considers that compliance with any comment raised by a User Consultation Group member would lead to a Change, the Design-Builder will, before taking into account such comment or objection, notify the Owner. If it is agreed by the Owner that such comments or objections would lead to a Change then the procedure as detailed in Part E- CHANGES of the

Agreement will apply. In all cases, the parties will cooperate to identify potential alternative solutions to any comments or objections raised that would not lead to a Change.

4.10 The User Consultation Group consultation meetings will be held in Vancouver, B.C., or another location designated by the Owner, at a space made available by the Owner.

4.11 A minimum of two dedicated meetings are required to review and discuss security programming for the Childcare Centre.

5. DISPUTES

5.1 If the Design-Builder disputes any comment issued by the Owner in respect of a Submittal, including on the basis that the comment is or would result in a Change, the Design-Builder will promptly notify the Owner of the details of such Dispute and will submit the reasons why the Design-Builder believes a different comment should be assigned, together with appropriate supporting documentation. The Owner will review the Submittal, the reasons and supporting documentation and within 7 Business Days after receipt thereof will either confirm the original comment or notify the Design-Builder of a revised comment. Nothing in this Section 4 will limit either party's right to refer a Dispute for resolution in the first instance to the Owner's Consultant under Section 62 (Dispute Resolution) of the Agreement.

6. EFFECT OF REVIEW

6.1 Any review of and comment by the Owner on any Submittals are for general conformity to the obligations and requirements of this Agreement, and any such review and comment will not relieve the Design-Builder of the risk and responsibility for the Design and the Construction and for meeting all of its obligations and requirements of this Agreement, and will not create any new or additional obligations or liabilities for the Owner. Without limiting the generality of the foregoing any and all errors or omissions in Submittals or of any review and comment will not exclude or limit the Design-Builder's obligations or liabilities in respect of the Design or the Construction under this Agreement or exclude or limit the Owner's rights in respect of the Design and the Construction under this Agreement.

7. SUBMITTAL EXPLANATION

7.1 At any time, the Owner may, acting reasonably, require the Design-Builder, including the Design-Builder's Consultant, Subcontractors and any other relevant personnel, at no additional cost to the Owner, to explain to the Owner and the Owner's advisors the intent of the Design-Builder's Submittals, including in relation to any design and any associated documentation and as to its satisfaction of the Statement of Requirements.

8. REVISIONS

8.1 The Design-Builder will ensure that Submittals and documents and/or drawings within the Submittal keep the same, unique reference number throughout the review process, and that all subsequent revisions of the same Submittal are identified by a sequential revision number and identified and tracked in the Submittal log. Correspondence related to such Submittal will reference the reference number and revision number.

8.2 Re-submittals will clearly show all revisions from the previous Submittal. Bound documents, including reports and manuals, will contain a preface that clearly states how revisions are marked and the previous revision number against which the revisions have been marked and highlighted within the document. A consistent format for mark-ups of documents will be used (e.g. deletions

struck out and additions underscored). Revised portions of drawings will be clearly marked (with appropriate means to visually distinguish between the parts of the drawing that are revised and the parts that are not revised) and the revision number and description of the revision will be included on the drawing.

8.3 All revisions on print media will be initialled by hand by the individual designer, design checker and, where applicable, by the drafter and the drafting checker and will identify the persons who initialled the Submittal. Electronic versions of the Submittal will identify the persons who initialled the revisions to the printed version of the Submittal.

8.4 The Design-Builder will keep all Drawings and Specifications current. If any Drawings and Specifications are revised as part of a Submittal, all other Drawings and Specifications relying on or based on those Drawings and Specifications will also be revised accordingly. All such revised Drawings and Specifications will also be submitted with the Submittal to which it relates.

9. AUDIT BY THE OWNER

9.1 Without limiting any other right under the Agreement, the Owner will have the right to audit all Submittals, including comparing all Submittals to previous Submittals.

9.2 If during an audit or at any other time it is discovered by the Owner or the Design-Builder that any Submittals were not correctly implemented, the Design-Builder will at its sole cost immediately take all necessary steps to correct and modify the applicable Submittals and the Design and Construction to which they relate and will advise the Owner of all such corrections and modifications.

APPENDIX 2A
SUBMITTALS

1. PROGRESSIVE SUBMITTALS

(a) The Design-Builder will provide Submittals to the Owner for review at the following stages:

(1) Schematic design (SD), generally intended to be an update of the Design material included in the Proposal Extracts - referred to as 30% complete in the following tables;

(2) Design development (DD), generally intended to show the resolved functional Design updated as agreed during user consultation meetings and will show the final design of the Facility's technical systems. It will include sufficient technical information on systems, assemblies and typical construction details to confirm the Design-Builder's intended materials and methods - referred to as 60% complete in the following tables;

(3) Construction documents (CD) (Drawings and Specifications), generally intended to be complete construction-ready drawings and specifications for Owner review - referred to as 90% complete in the following tables; and

(4) Issued for construction (IFC) Drawings and Specifications, generally intended to have limited review, focused only on components of the 90% Submittal that did not receive Reviewed status - referred to as 100% complete in the following tables.

(b) The Design-Builder will provide separate Submittals for all applicable drawings and specifications (Architectural, Interior Design, Code, Mechanical - HVAC, Plumbing, Electrical, Communications, Security and Landscape) specific to the Childcare Centre for all components of the Facility related to the Childcare Centre requirements with the exception of Submittals related to integrated Facility systems (building envelope, civil, electrical, LEED, mechanical and structural).

(c) Drawings and Models

(1) The Design-Builder will prepare and submit to the Owner for review:

(A) a BIM model using REVIT 2019;

(B) AutoCAD drawings Version 2019 including plot configuration files;

(C) PDFs of all drawings in metric (millimeter) and prepared to current industry standards; and

(D) full colour exterior and interior renderings.

(d) Exterior renderings will illustrate the following Facility elevations:

(1) School main entry showing front of School;

(2) view from West 33rd Avenue;

(3) view from the turf field south of the Site;

(4) view from Willow Street (east façade); and

(5) aerial view showing the Childcare Centre (including the outdoor play space) in relation to the Facility.

(e) Interior renderings will illustrate:

(1) School Commons;

(2) Typical Classroom;

(3) Library Learning Commons;

(4) Administration and entrance area; and

(5) One of the full day program spaces in the Childcare Centre,

such capitalized room names having the meaning established in Appendix 1A – School Functional Program and Appendix 1E – Childcare Centre Requirements to the Statement of Requirements.

1.2 Specifications

(a) Specifications for all disciplines will be organized according to CSI/CSC MasterFormat using the 2014 Update (50 Divisions; 6-digit Section numbers), using CSC full-page SectionFormat/PageFormat.

(b) The Design-Builder will provide complete Specifications for all disciplines with sufficient information to enable the Owner to verify the compliance with the Agreement and to accurately construct the Facility as intended.

2. ARCHITECTURAL CONSTRUCTION DOCUMENTS

Percentage Complete at Submission Stages	30% SD	60% DD	90% CD	100% IFC	Record Drawings
Drawing Content					
Site plans, sections and details – includes coordination with civil works, hard landscape features and site servicing	✔	✔	✔	✔	✔
Title sheet, legends, drawing list, key plans and assembly listings	✔	✔	✔	✔	✔
Floor plans, penthouse and roof plans	✔	✔	✔	✔	✔
Reflected ceiling plans	-	✔	✔	✔	✔
Exterior elevations	✔	✔	✔	✔	✔

Percentage Complete at Submission Stages	30% SD	60% DD	90% CD	100% IFC	Record Drawings
Interior elevations	-	✔	✔	✔	✔
Building sections, transverse, longitudinal	✔	✔	✔	✔	✔
Wall sections	-	✔	✔	✔	✔
Large scale plans for School Commons, Fine Arts, Athletics (including game lines) Administration and entrance area	✔	✔	✔	✔	✔
Large scale plans of Classrooms	✔	✔	✔	✔	✔
Large scale plans for interior and exterior spaces of the Childcare Centre	✔	✔	✔	✔	✔
Plan and section details	-	✔	✔	✔	✔
Vertical movement – plans, sections and details, stairs, ramps, elevators	-	✔	✔	✔	✔
Special elements, furnishings, and signage	-	✔	✔	✔	✔
Schedules, doors, windows, hardware, and finishes	-	✔	✔	✔	✔
Daylighting graphic plans and sections that show light gradation within spaces (not colour fill)	-	✔	✔	✔	✔
Specifications					
Table of contents	✔	✔	✔	✔	✔
General requirements	-	✔	✔	✔	✔
Existing conditions – if any	-	✔	✔	✔	✔
Concrete	-	✔	✔	✔	✔
Masonry	✔	✔	✔	✔	✔
Metals	✔	✔	✔	✔	✔
Wood, plastics and composites	✔	✔	✔	✔	✔
Thermal and moisture protection (including leak detection system)	✔	✔	✔	✔	✔
Openings	✔	✔	✔	✔	✔
Door hardware; door program, sequence of operation and functioning started in coordination with requirements for Electronic Safety and Security	-	✔	✔	✔	✔
Finishes	✔	✔	✔	✔	✔
Specialties	-	✔	✔	✔	✔
Equipment (including appliances with cut sheets)	-	✔	✔	✔	✔

Percentage Complete at Submission Stages	30% SD	60% DD	90% CD	100% IFC	Record Drawings
Furnishings	-	✔	✔	✔	✔
Special construction – if any	-	✔	✔	✔	✔
Conveying equipment – elevators	✔	✔	✔	✔	✔
Other					
Room Data Sheets and Hardware Cut Sheets	-	✔	✔	✔	✔

(a) The Design-Builder will clearly indicate:

(1) floor elevations (geodetic) complete with floor level changes, stairs and ramps; and

(2) floor finishing tolerances, slopes for drainage, drain openings, and other similar items.

(b) The Design-Builder will ensure that plans, sections and elevations:

(1) indicate the outlines of the exterior walls and partitions in relation to the structural framework complete with graphical representation of materials cross-references to partition types and dimensions;

(2) indicate the functions of each building material component and rain screen construction component, such as air barrier, vapour barrier, moisture barrier, acoustical barrier, security barrier, fire resistance, thermal resistance and the like;

(3) identify the location of doors and windows, and other openings complete with cross-references to door, window and hardware schedules;

(4) indicate the location of fixtures and equipment for washrooms, kitchens, meeting rooms, classrooms, equipment/mechanical/electrical/telecommunications rooms complete with cross-references to equipment schedules, notes and dimensions;

(5) indicate barrier-free access, path of travel, clearances complete with notes and dimensions;

(6) identify room name and number of interior space, maintaining the Owner room reference number as stated in the Room Data Sheets. The Record Drawings will include final room numbering as per the signage requirements in the Statement of Requirements and as coordinated with and approved by the Owner;

(7) graphically represent construction and finish materials for walls and floors;

(8) illustrate built-in furniture, millwork and equipment, including extent of wall protection (elevations); and

(9) graphically illustrate separations, including fire separation(s), acoustic separation(s), and zone separation.

(c) Reflected ceiling plans will contain:

(1) graphical representation of ceiling finishes, fixtures complete with cross-reference to lighting, security, sprinkler, HVAC, fire alarm, ceiling heights, access panel sizes and locations;

(2) clearly indicated bulkheads, if any, complete with graphical representation of construction and materials, notes, ceiling heights and dimensions; and

(3) clearly indicated graphical representation of systems and equipment interference for structural, mechanical, electrical, telecommunications, security, complete with cross-reference notes and dimensions.

(d) Penthouse and roof plans will contain:

(1) The location of fixtures and equipment for mechanical, electrical, maintenance, complete with notes and dimensions;

(2) Clearly indicated roof penetrations for equipment, hatches, access paver paths, radio antennae supports/ties, fall arrest and window washing anchors, etc.; and

(3) Graphically represent construction and finish materials for roof.

(e) Exterior elevations will contain:

(1) the location of doors and windows, borrowed lights, and other openings;

(2) graphical representation of construction and finish materials, including a legend and notations; and

(3) scuppers, down spouts or drainage systems, hose bibs and electrical outlets, and exterior light locations.

(f) Interior elevations will contain:

(1) the location of doors, windows, and other openings; all wall mounted equipment, all wall protection, dimensions of vertical changes in material and room numbers; and

(2) graphical representation of construction and finish materials, including a legend and notations, is to be provided.

(g) Building sections will contain:

(1) clearly indicated floor construction/assemblies, floor elevations, dimensions and ceiling lines; and

(2) clearly indicated graphical representation of systems and equipment interference for structural, mechanical, electrical, telecommunications, security, etc., complete with cross-reference notes and dimensions.

(h) Wall sections will contain:

(1) clearly indicated detail location tags and references; wall type notations; and critical dimensions;

(2) clearly indicated graphical representation of systems and equipment interference for structural, mechanical, electrical, telecommunications, security, etc. complete with cross-reference notes and dimensions; and

(3) continuous air barrier and vapour barrier location.

(i) Vertical movement plans, sections and details will contain clearly indicated rise and run, headroom clearances, landing elevations, vertical and horizontal dimensions, railing and guards complete with barrier-free clearances, notes and dimensions.

(j) Special elements, furnishings, systems furniture, signage, etc. will contain:

(1) detailed graphical representations of furniture, systems furniture, signage, etc. in relation to exterior and interior walls, structural framework, material connections and interrelationships complete with cross-reference to schedules, notes, materials, and dimensions; and

(2) detailed location of fixtures and equipment for telecommunications, public address systems, etc. complete with cross- reference to equipment schedules, notes and dimensions.

(k) Schedules (doors, hardware, windows, room finishes, furniture, etc.) will contain:

(1) clearly indicated material, size, fire/thermal/acoustic, colour, texture, pattern, etc.; and

(2) schedules may be graphical and/or tabular in drawing or specification format.

(l) Room Data Sheets will contain room measurements, area, ceiling height and information relating to equipment, millwork, casework and mechanical and electrical services, and all other details set out in the Room Data Sheets.

3. INTERIOR DESIGN CONSTRUCTION DOCUMENTS

Percentage of Drawings Completed	30% SD	60% DD	90% CD	100% IFC	Record Drawings
Drawing Content					
Floor plans, reflected ceiling plans	✔	✔	✔	✔	✔
Interior Elevations	-	✔	✔	✔	✔
Large scale plans	-	✔	✔	✔	✔
Plan and section details	-	✔	✔	✔	✔
Millwork – plans, sections, details	-	✔	✔	✔	✔
Special elements, furnishings, signage, etc.	-	✔	✔	✔	✔
Schedules, doors, windows, hardware, finishes, furniture, partitions, etc.	-	✔	✔	✔	✔

Percentage of Drawings Completed	30% SD	60% DD	90% CD	100% IFC	Record Drawings
Specifications					
Finishes	-	✔	✔	✔	✔
Specialties	-	✔	✔	✔	✔
Equipment	-	✔	✔	✔	✔
Furnishings	-	✔	✔	✔	✔
Sample Board/Presentation (separate presentations for School and Childcare Centre)					
Colour boards Master Colour Palette	-	✔	-	✔	✔
Sample boards	-	✔	-	✔	✔
Presentation to client	-	✔	-	✔	✔

(a) Floor plans will contain:

(1) the outlines of the exterior walls and interior partitions, cross-reference to partition types and dimensions;

(2) all millwork, furniture, fixtures and equipment, located on the floor plans, labelled and cross referenced to schedules and details;

(3) the designation (usually by room name and number) of interior space; and

(4) graphical representation of construction and finish materials for walls and floors.

(b) Interior elevations will contain:

(1) clear indication of wall finishes, colour choices and details, including wall protection details; and

(2) the location of doors and windows, and other openings complete with finishes.

(c) Large scale plans (scale 1:50 or larger) will include:

(1) spaces listed in Appendix 1A – School Functional Program to be represented at a large scale;

(2) spaces listed in Appendix 1E – Childcare Centre Requirements to be represented at a large scale;

(3) mechanical rooms;

(4) electrical rooms; and

(5) telecommunication rooms, including the Server Room and the Main Telecommunication Room.

(d) Millwork plans, sections and details will clearly indicate millwork layout, section elevations, and details complete with material choices, notes and dimensions.

(e) Special elements, furnishings, systems furniture, signage, etc. will contain:

(1) detailed graphical representations of furniture, systems furniture, signage, etc., complete with key plans, elevations, schedules, notes, materials and dimensions; and

(2) base building elements will be graphically distinct from special elements.

(f) Schedules:

(1) will contain clear indication of material, colour, texture, pattern, etc.; and

(2) may be graphical and/or tabular in drawing or specification format.

4. CODE CONSTRUCTION DOCUMENTS

Percentage of Drawings Completed	30% SD	60% DD	90% CD	100% IFC	Record Drawings
Drawing Content					
Fire Separation and Exiting Travel Distance Plans	✔	✔	✔	✔	✔
Code Compliance Report	✔	✔	✔	✔	✔

(a) Code compliance report will contain:

(1) VBBL data matrix including design considerations;

(2) fire and life safety data summary (may be illustrated graphically); and

(3) approach to BC Building Code compliance including any proposed alternative solutions.

5. CIVIL CONSTRUCTION DOCUMENTS

Percentage of drawings completed	30% SD	60% DD	90% CD	100% IFC	Record Drawings
Drawing Content					
Title sheet, typical sections and details used on this project	✔	✔	✔	✔	✔
Existing conditions	✔	✔	✔	✔	✔
Erosion and sediment control	✔	✔	✔	✔	✔
Temporary service during Construction	✔	✔	✔	✔	✔

Percentage of drawings completed	30% SD	60% DD	90% CD	100% IFC	Record Drawings
Drawing Content					
Site coordination and layout and turning templates for service and emergency vehicles	✔	✔	✔	✔	✔
Storm water drainage plan	✔	✔	✔	✔	✔
Grading, site servicing, roads, parking lot(s), hardscape and street lights	✔	✔	✔	✔	✔
Deep and shallow utilities plan and profile, on and off site	✔	✔	✔	✔	✔
Retaining walls plan and profile <1.0m high	✔	✔	✔	✔	✔
Sections and details	✔	✔	✔	✔	✔
Pavement marking and signage plans	-	-	✔	✔	✔
Specifications					
Clearing, Grubbing & Stripping	✔	✔	✔	✔	✔
Earthworks	✔	✔	✔	✔	✔
Site Servicing	✔	✔	✔	✔	✔
Water, Sanitary Sewer and Storm Sewer	✔	✔	✔	✔	✔
Flushing, Pressure Testing & Disinfection Plan	✔	✔	✔	✔	✔
Base and Sub Base Course Aggregates	✔	✔	✔	✔	✔
Asphalt Paving	✔	✔	✔	✔	✔
Exterior Improvements	✔	✔	✔	✔	✔
Manholes and Catch basins	-	-	✔	✔	✔
Cast in place concrete	-	-	✔	✔	✔
Pavement Markings	-	-	✔	✔	✔

(a) Existing conditions drawing(s) will contain all pertinent topographic information, contours at appropriate intervals with spot elevations in clear legible format, all underground utilities including inverts and depths, size and type, borehole and test pit locations and elevations, existing and new survey monuments.

(b) Erosion and sediment control drawings will contain existing topographic information, contours at appropriate intervals with spot elevations, calculations for sizing of erosion and sediment control facilities, design and layout of each facility, storm water discharge connection and location, quality measurement point, and details of erosion and sediment control facilities.

(c) Site coordination and layout drawing(s) will contain:

(1) horizontal and vertical controls; the principal site elements to be constructed; survey monuments and/or nearby buildings or structures which may be used to show the relative location of the proposed structure of work; sufficient dimensions or coordinates that the exact location of proposed work is clearly identified; construction lay down area; relative locations of all below and above ground utilities (i.e. electrical, water main, sanitary sewer, storm sewer, etc.); site removals;

(2) demonstrated vehicle/pedestrian movement for all types of expected traffic to and from the Facility; and

(3) a plan for flushing, pressure testing and disinfecting the water service to the Facility, which the Design-Builder will develop and submit to the City of Vancouver for approval.

(d) Grading plan will contain the building footprint and finished floor elevation, proposed grades with existing contours/grades provided in background in light font, drainage structures numbered, typical sections, dimensions and proposed site development features, including pavement/curb, sidewalk type, and street light locations.

(e) Deep and shallow utilities plan and profile will contain horizontal location and vertical depths of new, existing, and temporary services; manholes; drainage structures; valves; roof leader tie in points; location of foundation drainage (if required); structure data table.

(f) Storm water management plan will contain catchment areas, existing storm sewer systems, flow direction, calculations for pre-development and post-development flows, detention calculations and best management practices as well as all requirements to meet VBBL.

(g) Offsite drawings will include all drawings and details required by the City of Vancouver to secure a works and services agreement, if required, for the offsite works.

(h) At a minimum, the as-built drawing package will include Engineer-certified as-constructed drawings for the applicable onsite and offsite works.

6. STRUCTURAL CONSTRUCTION DOCUMENT

Percentage of Drawings Completed	30% SD	60% DD	90% CD	100% IFC	Record Drawings
Drawing Content					
Title Sheet, General Notes	✔	✔	✔	✔	✔
Typical Details	✔	✔	✔	✔	✔
Slab, Column, and Beam Schedules	✔	✔	✔	✔	✔
Foundation Plans	✔	✔	✔	✔	✔
Floor and Roof Framing Plans	✔	✔	✔	✔	✔
Sections and Details	✔	✔	✔	✔	✔
Wall and Bracing Elevations	✔	✔	✔	✔	✔
Wall Sections	✔	✔	✔	✔	✔
Specifications					
Concrete (Division 03)	✔	✔	✔	✔	✔
Masonry (Division 04)	✔	✔	✔	✔	✔
Metals (Division 05)	✔	✔	✔	✔	✔
Earthwork and Piling (Division 31)	✔	✔	✔	✔	✔

(a) Title Sheet, General Notes, will contain:

(1) general description of the structure, its main components, gravity load resisting and lateral load resisting systems;

(2) Codes and standards, with dates of issue, to which the design conforms;

(3) description of the lateral load resisting system will indicate values of Rd (ductility factor) and Ro (overstrength factor) used in the design;

(4) importance factors used in the design;

(5) design criteria indicating vertical design loads including dead and superimposed dead loads; occupancy live loads; snow loads (including drift); wind uplift loads; mechanical equipment loads; construction loads; lift loads; special loading considerations;

(6) horizontal design loads indicated including seismic loads, wind loads, lateral earth pressures and hydrostatic pressures;

(7) loading plans showing area loads not covered by design criteria information such as planter and soil loads with an indication of maximum soil depth;

(8) geotechnical information used in the design including reference to geotechnical report, footing or pile bearing capacities, site classification and site coefficients;

(9) concrete mix requirements indicating application, exposure classification, minimum 28-day compressive strength, and maximum aggregate size; and

(10) concrete cover requirements, based on weather and soil exposure, fire resistance rating, or chloride penetration.

(b) Schedules as required for items such as columns, beams, slabs, walls, foundations, baseplates, and embed plates.

(c) Foundation plans, fully coordinated with other consultant's drawings, will contain:

(1) gridlines and gridline dimensions;

(2) foundation types, sizes and reinforcement, including strip footings, pad footings, rafts, piles and pile caps, soil anchors and grade beams. Foundations will be located relative to the supported structure. Indicatively show and detail steps in footings; indicate pile base and cut-off elevations. Indicate frost protection and ad freeze mitigation measures;

(3) interior slabs-on-grade including thickness, reinforcement, contraction joint requirements, and subgrade requirements including moisture barrier if required. Indicate step heights or top of slab elevations and ensure step conditions etc. are sufficiently detailed. Show pits for elevators and mechanical openings;

(4) concrete walls including thickness and reinforcement. Clearly indicate shear walls and, if detailed elsewhere, ensure adequate referencing. Ensure wall corners, openings, intersections control joints, and construction joints are sufficiently detailed. Provide full height wall sections as required;

(5) concrete columns, pedestals and pilasters including dimensions and reinforcement, including tie arrangement details;

(6) steel columns including size and base plate details; and

(7) load bearing masonry walls if applicable, including stud sizes and spacing, plywood sheathing thickness and nailing requirements, masonry unit dimensions, reinforcement and grouting. Provide sufficient details as required.

(8) floor and roof framing plans will be fully coordinated with the Design-Builder's other consultant discipline drawings and will contain:

(A) gridlines and gridline dimensions;

(B) concrete slabs including thickness, cambers and reinforcement. Show all openings coordinated with other consultants. Indicate step heights or relative elevations. Ensure step conditions, slab edge conditions, construction joints, delay strips, and such are sufficiently detailed;

(C) concrete walls including thickness and reinforcement. Clearly indicate shear walls and, if detailed elsewhere, ensure adequate referencing. Ensure wall corners, intersections, control and construction joints are sufficiently detailed. Provide full height wall sections as required;

(D) concrete columns, pedestals and pilasters including size and reinforcement, including tie and column rebar arrangement details. Ensure that columns starting, stopping and continuing are sufficiently detailed; ensure that offset column transitions are sufficiently detailed;

(E) concrete beams including dimensions and reinforcement. Elevate beams with complex reinforcement. Ensure beams are sufficiently detailed;

(F) detail concrete stairs, including throat thickness, reinforcement and sufficient details for cast in place stairs. For precast concrete stairs provide sufficient seating details;

(G) steel deck with or without concrete topping including thicknesses, deck type, connection to supporting structure, and shear transfer elements. Ensure sufficient deck edges, mechanical openings, ledger angles, framing around openings, and structural requirements for support of mechanical equipment are adequately detailed;

(H) steel beams, open web steel joists and steel trusses, including member sizes or depths, spacing, embed plates where connected to concrete and cambers. Ensure all design forces and moments are provided for use by connection designer, open web steel joist designer and truss designer. Ensure steel girts and ledgers between levels are clearly called up. Provide elevations for members between levels if required for clarity;

(I) steel columns including size, base plate, embed plate and cap plate details;

(J) detail steel stairs, including stringer sizes and connection details;

(K) detail all specialist equipment supports, including gymnasium equipment and mechanical equipment; and

(L) accurately record as-built placement of in-floor reinforcing steel, etc. to maximize the potential for and ease of future floor penetrations.

(9) Elevations, fully coordinated with other consultants drawings, for the following items:

(A) concrete wall or shear wall elevations as required to convey information not detailed on plan including complex areas of reinforcement, openings, shear wall zones, headers and such;

(B) concrete beam elevations for beams with complex reinforcement;

(C) steel bracing elevations including member sizes, forces and sufficient information for connection designer; and

(D) any other elevations deemed necessary to convey sufficient structural information.

(10) Sections and details will contain information for all structural conditions not dealt with completely on plans, elevations or schedules. Additional information includes, but is not limited to clarification of structural geometry, reinforcement, and connection configurations and welding.

7. MECHANICAL CONSTRUCTION DOCUMENTS

Percentage of Drawings Completed	30% SD	60% DD	90% CD	100% IFC	Record Drawings
Drawing Content					
Legends, regulatory data, drawing list, key plans	✔	✔	✔	✔	✔
Fire suppression – plans, sections, details	✔	✔	✔	✔	✔
Plumbing – plans, sections, details (including drainage)	✔	✔	✔	✔	✔
HVAC – plans, sections, details	✔	✔	✔	✔	✔
Integrated Automation – plans, sections, details Schematics and schedules, air and water flow diagrams, equipment schedules, control schematics, sequence of operations, etc.	-	✔	✔	✔	✔
HVAC – equipment schedules	-	✔	✔	✔	✔
Plumbing fixture schedule	-	✔	-	-	✔
Washroom fittings	✔	✔	-	-	✔
Specifications					
General Requirements	-	-	✔	✔	✔
Fire Suppression	-	-	✔	✔	✔
Plumbing (including sediment traps with cut sheet and plumbing fixtures cut sheets)	-	-	✔	✔	✔
Heating, Ventilating and Air Conditioning	-	-	✔	✔	✔
HVAC Integrated Automation	-	-	✔	✔	✔
Other					
Design Report	✔	✔	-	-	-
LEED Energy Model Report	✔	-	-	✔	-

(a) The 30% Submittal will contain sufficient information for the Owner to understand the proposed mechanical systems, the location of all mechanical equipment and the location of main distribution routes and shafts. At 30%, all key Design decisions related to mechanical system strategies will have been made and should be documented for review. Any decisions which are to be made as the Design develops to 60% will be identified. The 30% Submittal will consist of a report and supporting drawings as listed below:

(1) a report describing the mechanical systems and how they will comply with the requirements. The report will include the capacities of the heating and cooling plant, main air handling units and any equipment which is used in multiple locations, such as unit ventilators.

(2) heating and cooling schematic.

(3) layout drawings showing:

(A) mechanical rooms;

(B) location of roof mounted air handling units and exhaust fans; and

(C) main mechanical services distribution routes and shafts.

(4) preliminary energy model in accordance with LEED submission requirements to demonstrate that the Design will achieve the number of energy points noted in the LEED compliance checklist.

(b) The 60% Submittal will document the finalised mechanical system design proposals, how they support the resolved functional design and how they integrate with the architecture and other engineering disciplines. Review of the 60% Submittal should allow the Owner to evaluate whether the Design is fundamentally compliant to the requirements. Design development beyond 60% should be to resolve construction details and there should be no significant Design decisions taken after this Submittal. The 60% Submittal will include:

(1) a report describing the mechanical systems and how they will comply with the contract requirements. The report will include the capacities of the heating and cooling plant, main air handling units and any equipment which is used in multiple locations, such as unit ventilators. The report will include an overview of the proposed control strategies. As an alternative to a report, outline specifications can be provided which include the same information;

(2) cover sheet drawings including site location, general notes, and basis of Design;

(3) drawings for fire suppression system including:

(A) fire suppression schematic showing all piping up to and including sprinkler zone valves;

(B) sprinkler layouts at minimum 1:100 scale which show the following information:

1. zoning including hazard classification for each area and wet or dry sprinkler zones;

2. location of all main sprinkler equipment including sprinkler zone valves; and

3. any specialist fire suppression elements required as part of an alternative solution to code requirements;

(4) drawings for Plumbing System including:

(A) schematics for domestic hot and cold water system, sanitary system and storm system;

(B) layouts at minimum 1:100 scale to show main below ground drainage runs, connection to site utilities and locations of storm and sanitary sumps, grease and oil interceptors;

(C) layouts at minimum 1:100 scale to show domestic hot and cold water system including locations of all plumbing equipment including water heaters, main distribution routes and main pipe sizes;

(D) layouts at minimum 1:100 scale to show storm and sanitary drainage system including all main stack locations and roof drain locations;

(E) layout for water entry room at 1:20 scale;

(F) plumbing fixture schedules including manufacturer, model numbers, cut sheets and accessories; and

(G) include drainage layout with all sediment traps and cut sheets.

(5) drawings for HVAC system including:

(A) heating and cooling schematic labelled with pipe sizes and flowrates;

(B) ventilation schematic labelled with flowrates;

(C) layouts at minimum 1:100 scale to show HVAC system including equipment, duct and piping mains. Final connections to diffusers and terminal units do not need to be shown at this stage;

(D) layout at minimum 1:50 scale for mechanical rooms with service clearance noted; and

(E) HVAC equipment schedule including equipment capacities, manufacturer and model numbers; and

(6) a minimum of five coordinated section details at 1:20 scale at key ‘pinch points’ to demonstrate that specified minimum ceiling heights will be maintained while achieving proper access for inspection and maintenance.

(c) The 90% Submittal will be a comprehensive set of Design documents with only relatively minor details or coordination issues to be resolved. The Submittal will be of sufficient detail that the Owner can complete a full compliance review. The 90% Submittal will include:

(1) Design calculations including:

(A) hydraulic calculations for fire suppression system;

(B) plumbing system calculations including domestic hot and cold water pipe sizing, storm and sanitary pipe sizing, water heater sizing calculation and sump pump calculations;

(C) HVAC calculations including heating and cooling loads, air flow rate calculations, fan pressure loss calculations, pump head calculations and expansion tank sizing; and

(D) acoustic calculations to demonstrate that room noise criteria will be met with specified equipment and silencers; and

(E) calculations to demonstrate compliance with ASHRAE Standard 55-2017. Calculations shall be provided for a minimum of 10 rooms, with the rooms to be selected by the Owner as part of the review of the 60% submittal;

(2) specifications for mechanical general requirements, fire suppression, plumbing, HVAC and Facility automation system;

(3) fire suppression drawings including:

(A) fire suppression schematic showing all piping up to and including sprinkler zone valves;

(B) layout drawings at minimum 1:100 scale showing all fire suppression piping and sprinkler head locations; and

(C) details as required to fully document how the system is to be installed.

(4) plumbing drawings including:

(A) schematic riser diagrams for domestic hot and cold water, sanitary drainage and venting, storm drainage and natural gas;

(B) layouts at minimum 1:100 scale to show below ground drainage system, connection to site utilities and locations of storm and sanitary sumps, grease and oil interceptors;

(C) layouts at minimum 1:100 scale to show entire domestic hot and cold water system;

(D) layouts at minimum 1:100 scale to show storm and sanitary drainage system;

(E) layout for water entry room at 1:20 scale;

(F) details as required to fully document how the system is to be installed; and

(G) plumbing fixture schedules including manufacturer and model numbers, along with cut sheets;

(5) HVAC drawings including:

(A) heating and cooling schematic labelled with pipe sizes and flowrates;

(B) ventilation schematic labelled with main duct sizes and flowrates;

(C) layouts at minimum 1:100 scale to show HVAC system including equipment, ducts and heating and cooling pipework. Layouts shall indicate service clearance for all equipment;

(D) layout at minimum 1:50 scale for mechanical rooms with service clearances noted;

(E) details as required to fully document how the system is to be installed; and

(F) HVAC equipment schedule including equipment capacities, manufacturer and model numbers;

(6) HVAC Integrated Automation drawings including:

(A) control diagrams for HVAC equipment showing sensors, devices and controllers to indicate how the systems are controlled. Typical diagrams may be used where there are a number of systems which are the same; and

(7) a minimum of five coordinated section details at 1:20 scale at key 'pinch points' to demonstrate that specified minimum ceiling heights will be maintained while achieving proper access for inspection and maintenance.

(d) The 100% Submittal will consist of a full 'Issued for Construction' document set. This submission will meet all requirements of the 90% Submittal and will address all review comments on that Submittal. The 100% Submittal will also include the final LEED Energy Model.

(e) Record drawings will be based on the 100% Issued for Construction, updated to include all changes to the Design during construction. Each drawing will be identified in the lower right hand corner in letters at least 12 mm high as follows: - "RECORD DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED", and signed and dated by the Design-Builder.

(f) Mechanical shop drawings will be provided as set out in Appendix 1H – VSB Mechanical Standards.

8. ELECTRICAL, COMMUNICATIONS AND SECURITY CONSTRUCTION DOCUMENTS

Percentage of Drawings Completed	30% SD	60% DD	90% CD	100% IFC	Record Drawings
Drawing Content					
Legends, regulatory data, drawing list, key plans	✔	✔	✔	✔	✔
Location, Site – plans, sections and details	✔	✔	✔	✔	✔
Utility pathway connections for power and communications	✔	✔	✔	✔	✔

Percentage of Drawings Completed	30% SD	60% DD	90% CD	100% IFC	Record Drawings
Power Single Line Diagram and Details	✔	✔	✔	✔	✔
Grounding Diagram and Details (including comm. equipment)	✔	✔	✔	✔	✔
Lighting Control Diagram and Details	✔	✔	✔	✔	✔
Communications Schematics	✔	✔	✔	✔	✔
Communications Risers – Pathway and Backbone	✔	✔	✔	✔	✔
Wireless Communications Schematics & Diagram	✔	✔	✔	✔	✔
Security Riser Diagrams	✔	✔	✔	✔	✔
Public Address Risers	✔	✔	✔	✔	✔
Fire Alarm Riser Diagram and Zone Schedules	✔	✔	✔	✔	✔
System integration diagrams	✔	✔	✔	✔	✔
Large Scale – Electrical and Communication rooms layouts, plans, and 3D layout including equipment dimensions.	✔	✔	✔	✔	✔
1:50 typical Floor Plans for Rooms with Audio Visual equipment including viewing angles	-	✔	✔	✔	✔
Power and Communications - floor plans, sections, details and circuiting	✔	✔	✔	✔	✔
Security, PA and systems - floor plans, details and infrastructure, security equipment cut sheets (including door control system i.e. aiphone, etc.)	-	✔	✔	✔	✔
Fire Alarm - floor plans, details and zoning	-	✔	✔	✔	✔
Lighting, Emergency Lighting and Lighting Controls – plans, sections, details and circuiting including light fixture cut sheets	-	✔	✔	✔	✔
Photometric of Childcare Centre interior and exterior outdoor play	-	✔	✔	✔	✔

Percentage of Drawings Completed	30% SD	60% DD	90% CD	100% IFC	Record Drawings
space					
Schedules – Panels, Luminaire, Mechanical, etc.	-	✔	✔	✔	✔
CPTED Report	-	✔	✔	✔	✔
Specifications					
General Requirements	-	-	✔	✔	✔
Electrical (Div 26)	-	-	✔	✔	✔
Communications (Div 27)	-	-	✔	✔	✔
Electronic Safety and Security (Div 28)	-	-	✔	✔	✔

(a) The 30% Submittal will contain sufficient information for the Owner to understand the proposed electrical systems including the location of main electrical equipment. At 30%, key design decisions related to electrical system strategies will have been made and documented for review. The 30% Submittal will consist of a report and supporting drawings as listed above and described below.

(b) The 60% Submittal will document the finalised electrical system design, how they support the resolved functional design and how they integrate with the architecture and other engineering disciplines. Review of the 60% submittal will allow the Owner to evaluate whether the Design is fundamentally compliant to the requirements. Design development beyond 60% should be to resolve construction details and there should be no significant design decisions taken after this submittal. The 60% Submittal will consist of a report and supporting drawings as listed above and described below.

(c) The 90% Submittal will be a comprehensive set of Design documents with only relatively minor details or coordination issues to be resolved. The submittal will be of sufficient detail that the Owner can complete a full compliance review.

(d) The 100% Submittal will consist of a full 'Issued for Construction' document set. This submission will meet all requirements of the 90% Submittal and will address all review comments on that Submittal.

(e) The 'Regulatory Sheet' will contain (may be included on title sheet) Design load assumptions and calculations. Calculations may be submitted separately in report format.

(f) The Design-Builder will submit the following documents as part of the submissions. No handwritten calculations will be accepted. The Design Builder will include every assumption, calculation method, constants, parameters, breakdowns, code requirements, minimum acceptable, error margins, manufacture recommendations and any other piece of information that will assist the Owner to determine compliance for all systems and components, including:

(1) a power system study including:

(A) short circuit study and analysis;

(B) coordination study including thermal and magnetic curves; and

(C) arc flash study for incident energy analysis;

(2) lighting model and calculations including:

(A) onterior and exterior illuminance levels (Avg., Max, Min, Max/Min, Avg./Min, lighting power density, uniformity, luminaire heights, calc. points heights) and photometric;

1. exterior luminaires spillage on all adjacent properties and roadways;

2. calculations of all the upward, backward and glare; and

3. vertical as well as horizontal illuminance;

(3) generators and load calculations;

(4) load calculation per CEC;

(5) UPS load calculations;

(6) transformers load calculations;

(7) voltage drop calculations;

(8) cable tray sizing, including wiring breakdown, counts, spare capacity and cable tray sizes used; and

(9) proposed equipment cut sheets including luminaires, lighting controls, electrical distribution, wiring devices, generator, transfer switch, fire alarm system and devices, communications cabling and equipment, security head-end and devices.

(g) Electrical plans, sections, details will contain details and system design elements to scale, including:

(1) Design calculations for short circuit, voltage drop, generator, UPS, etc.;

(2) clearly indicated ceiling and slab elevations complete with level changes, bulkheads, beams, etc.;

(3) the location of doors and windows, and all other openings;

(4) plywood backing;

(5) the location of main switchgear, transformer, generator and other major equipment, service rooms, etc.;

(6) the location and sizes of all feeders, conduits and raceways underground and above;

(7) the location and graphical representation of fixtures and equipment for washrooms, kitchens, conference rooms, equipment / mechanical / electrical/ telecommunications rooms complete with indication of seismic restraints;

(8) the designation (usually by room number) of interior spaces; and

(9) graphic indication of fire separation(s), acoustic separation(s), security separation(s), etc.

(h) Power and communications plans, sections, details will contain details and system design elements to scale, including but not limited to:

(1) locations and sizes of main feeders, circuit panels, conduits and raceways;

(2) single line diagram drawing of primary and secondary power distribution including normal power, emergency and buck-up power and UPS; and power quality and metering equipment;

(3) telecommunications and data systems drawings:

(A) IT network logical diagram – showing all systems on the Owner's network;

(B) IT network physical diagram – showing all the physical connections between the systems;

(C) IT VOIP and PA network diagram;

(D) IT wireless network diagram;

(E) Communication room layout diagrams to include dimensions and section views of each wall including equipment, floor plans and reflected ceiling plans;

(F) telephony diagram; and

(G) all other communications diagrams and the integrations between all systems, including all the equipment, interfaces, wiring, connectors and middleware.

(4) Public address systems drawings will include all head-end, infrastructure and demarcation locations as well as single-line riser drawings.

(i) Lighting plans, sections, details will contain many details and system design elements to scale, including but not limited to:

(1) reflected ceiling plan including:

(A) complete lighting layout;

(B) all emergency lighting, including clear indication of zoning;

(C) light levels;

(D) exit devices, complete with cross-references to lighting and equipment schedules and details; and

(E) complete lighting control layout, including all devices, locations, wiring between all components, override switches, dimming zones and zoning diagrams, etc.

(2) circuit layout of lighting control system.

(j) Fire alarm and public address plans, sections, details will contain many details and system design elements to scale, including but not limited to:

(1) locations of all graphic annunciator panels, all fire alarm initiation and alarm devices, and all integrations;

(2) single line riser diagram of fire alarm;

(3) fire alarm zone schedules; and

(4) fire alarm sequence of operations.

(k) Security plans, sections, details will contain:

(1) locations of intrusion alarm and disarming keypads;

(2) locations of proposed exterior site, door, window, area detectors and control devices;

(3) single line security riser drawing;

(4) locations of all field devices, panels, repeaters, and junction points; and

(5) integration and installation details for each system, and each system combined with other systems. include all integration, physical connectivity and communications protocols that will be employed.

(l) Large scale plans, sections, details will contain:

(1) locations of equipment, panels, generators, switchgear, etc., complete with space for maintenance and removal.

9. ELEVATOR CONSTRUCTION DOCUMENTS

(a) The Design-Builder is to make submissions to the Owner for review at the following stages:

Percentage of Drawings Completed	30% SD	60% DD	90% CD	100% IFC	Record Drawings

Percentage of Drawings Completed	30% SD	60% DD	90% CD	100% IFC	Record Drawings
Specifications					
Elevator Specifications	-	✔	✔	✔	✔
Procurement					
Provide a copy of the "Non-Proprietary Equipment Control and Tools" statement signed by the elevator manufacturer for the elevator work	-	✔	✔	✔	✔
Technical Submission Review	-	-	-	✔	✔
Construction					
Final Inspection Report	-	-	-	-	✔
Commissioning					
Technical Submission Review – Record Drawings	-	-	-	✔	✔
Commissioning Plan Review – Commissioning	-	-	-	✔	✔

10. LANDSCAPE CONSTRUCTION DOCUMENT

Percentage of Drawings Completed	30% SD	60% DD	90% CD	100% IFC	Record Drawings
Drawing Content					
Tree Removal and Protection Plan	✔	✔	✔	✔	
Demolition Plan	✔	✔	✔	✔	
Site Grading Plan	✔	✔	✔	✔	✔
Layout and Materials Plan (including layout of Childcare Centre play areas as well as extent of material finishes and vegetation)	✔	✔	✔	✔	✔
Irrigation Plan	-	✔	✔	✔	✔
Planting Plan	-	✔	✔	✔	✔
Landscape Details	-	✔	✔	✔	✔
Landscape Enlargement Plans	-	✔	✔	✔	✔
Specifications					
General Requirements	✔	✔	✔	✔	✔
Tree Protection	-	✔	✔	✔	-
Hardscape	-	✔	✔	✔	✔
Equipment	-	✔	✔	✔	✔
Furnishings	-	✔	✔	✔	✔

Percentage of Drawings Completed	30% SD	60% DD	90% CD	100% IFC	Record Drawings
Finishes	-	✔	✔	✔	✔
Planting*	-	✔	✔	✔	✔
Landscape Establishment Maintenance	-	✔	✔	✔	✔
Sample Board/Presentation					
Colour Boards Illustrating Planting and Materials	-	✔	✔	✔	✔
Sample Boards and Finishes (i.e. Childcare Centre colour sample of poured in place rubber, etc.)	-	✔	✔	✔	✔

*Planting specifications to include planting of trees, shrubs and groundcover, topsoil and finish grading, mulch, seeding, sodding.

(a) The 30% Submittal will include scalable, digitally produced, colour rendered, form and character drawings which illustrate the following:

(1) outline of existing and proposed building(s) with existing trees or treed areas;

(2) parking layout and surface treatment;

(3) site sections and elevations;

(4) soft landscape treatment (trees, hedges, planting beds, vines, lawn etc.);

(5) landscape structures (fences, trellis, arbours, retaining walls, lighting etc.);

(6) location and size of amenity areas (if applicable);

(7) location and size of courtyard and garden areas;

(8) location of landscape elements (including Site furniture, bike racks and garbage enclosures etc.);

(9) preliminary grading information sufficient to determine special treatment or provisions to retaining elements;

(10) a sun/shade study for the landscape elements; and

(11) landscape enlargement plans.

(b) The 60% Submittal will document the finalised landscape Design proposal, how it supports the resolved functional design and how it integrates with the architecture and other disciplines. Review of the 60% Submittal will allow the Owner to evaluate whether the design is fundamentally compliant to the requirements. Design development beyond 60% should be to resolve construction details and there should be no significant design decisions taken after this Submittal. The 60% Submittal will include:

(1) resolved layout and grading plans of the Site;

(2) resolved site sections and elevations;

(3) completed irrigation and planting design. standard details will be included, with site-specific details underway;

(4) water conservation and irrigation plan prepared by a qualified professional inclusive of a hydro zone plan, landscape water conservation irrigation report (landscape water budget) and an irrigation design;

(5) a preliminary plant list of trees, shrubs, perennials and ground covers including quantities, botanical and common names, planting sizes, and on-centre spacing; and

(6) location, material and height of landscape elements (including site furniture, bike racks and garbage enclosures etc.).

(c) The 90% Submittal will include completed layout and grading, irrigation and planting design. All details will be complete. Submittal will incorporate Owner input received at previous submissions.

(d) The 100% Submittal will incorporate Owner input received at all previous submissions.

11. OPERATION AND MAINTENANCE MANUALS

(a) Refer to the Project Binder requirements described in Section 44 [Project Binder and Record Drawings] of the Agreement.

(b) Operation & Maintenance Manuals for the mechanical systems will meet the requirements set out in Appendix 1H – VSB Mechanical Standards.

(c) Operation & Maintenance Manuals for the electrical systems will meet the requirements set out in the Appendix 1I – VSB Electrical Standards.

(d) Architectural: Provide complete re-glazing instructions in the Operations and Maintenance manuals.

12. MOCK UP ROOMS AND PROTOTYPES

(a) The Design-Builder will, at its cost and as part of the user consultation and design review process described in this Schedule 2, provide and make available to the Owner for review the “mock-ups” and “prototype” rooms described in this Section 12.

(b) The Design-Builder will include dates on the Submittal Schedule for construction of, and Owner review of, mock-ups. The time periods for Owner review and comments on Submittals set out in this Schedule 2 will apply to mock-ups.

(c) By the date set out in the Submittal Schedule, the Design-Builder will provide 1:1 scale mock-ups (using either paper, tape markings on the floor or similar) of each of the following rooms indicating the dimensions and sizing of the room and location of millwork, services, equipment and furniture. Light switches, receptacles and data outlets are to be included.

(1) typical classroom including teaching wall (writeable erasable wall, sight lines, views, glazed partitions), classroom millwork and tack boards;

(2) chemistry lab (including location of gases, fume hood, sinks, fixed lab benches, fixed millwork, drains, emergency eyewash and electrical duplexes and metal bar);

(3) typical home economics textiles and foods room; and

(4) typical gymnasium court layout including all painted games lines.

(d) By the date set out in the Submittal Schedule, the Design-Builder will provide 1:1 scale mock-ups of portions of the millwork, including hardware, finish samples and AWMAC quality, for each of the following:

(1) science lab bench and counters, fixed chemistry lab bench and teacher demonstration station;

(2) deep open music instrument storage shelf;

(3) base cabinet, counter top with lockable double doors and adjustable shelves;

(4) base cabinet glazed with solid counter top, lockable sliding glass doors;

(5) wall hung upper cabinet with double doors and shelves;

(6) For the Childcare Centre:

(A) toddler / infant cubby;

(B) 3-5 cubby;

(C) parent room display;

(D) staff counter; and

(E) upper cabinet.

(e) By the date set out in the Submittal Schedule, the Design-Builder will provide a 3-dimensional rendering of each of the following rooms indicating the dimensions and sizing of the room and location of millwork, services, equipment and furniture:

(1) typical Classroom;

(2) Library Learning Commons

(3) School Commons;

(4) Kitchen and Servery;

(5) Drama Studio; including Sound/Lighting Booths and Sound/Light Locks

(6) typical Science Classroom; and

(7) Gymnasium.

(8) for the Childcare Centre, Activity Room Infant demonstrating adjacencies and the outdoor play spaces,

with such capitalized room names used in this Schedule have the meaning established in Appendix 1A – School Functional Program and Appendix 1E – Childcare Centre Requirements. The mechanical system is to be included in the 3-dimensional rendering (e.g. where embedded in millwork, if chilled beams used, if displacement terminals used, etc.).

(f) By the date set out in the Submittal Schedule, the Design-Builder will provide construction mock-ups of the following building elements in situ:

(1) typical exterior wall assemblies for each wall system (masonry veneer, metal wall panel assemblies, and any other exterior wall system as applicable);

(A) include exterior wall finishes, back-up walls, wall cavities, doors, membrane and metal flashings, air barrier membrane seal, insulation, sealants, sheathing and sheathing membranes as applicable;

(2) window and curtain wall systems (complete with water penetration tests – 2.5 tests per 100 units of glazing).

(A) include installed curtain wall frames and window frames, window anchors, glazing, membrane and flashing, air/vapour membrane connection and sealants as applicable, and window trims (exterior interface);

(3) resilient flooring and wood sprung floors;

(4) typical interior door, frame and hardware;

(5) ground and polished concrete;

(6) wood ceiling (ceiling area large enough to evaluate a fixed full ceiling panel, a full access panel inclusive of removal clips, and integration with all service components inclusive of light fixtures, sprinkler heads, hvac louvre and security camera;

(7) bituminous damproofing, crystalline waterproofing;

(8) roofing system – sbs modified bitumen roofing membrane; and

(9) glass guardrail complete with all components.

(g) The Design-Builder will modify the mock-ups as may be required as the Design develops based on feedback from the User Consultation Groups and the Owner.

(h) The purpose of the mock-up is to illustrate the Design. The Design-Builder will update all Design documentation to reflect the mock-ups and prototypes, and any input from the

Owner, including User Consultation Groups, and will submit all such updated Design documentation to the Owner for review under this Schedule 2. Mock-ups will remain in place for reference until the updated documentation has received Reviewed status.

(i) The Design-Builder will provide a site for the mock-ups at a location either within the Facility as it is under construction, or at another location provided by the Design-Builder near the Facility that is acceptable to the Owner.

13. TESTING REQUIREMENTS

(a) Structural Steel, steel joists and steel decking: material quality including sourcing and welding quality to be controlled by an independent testing agency retained by the Design-Builder. Documentation to be provided to the Owner with the final documents.

(b) Concrete reinforcement and grout: material quality including sourcing to be controlled by an independent testing agency retained by the Design-Builder. Documentation to be provided to the Owner with the final documents.

(c) The Design-Builder will provide concrete testing for flooring for moisture, alkalinity and bond testing prior to flooring installation. Testing will be done by an independent testing agency retained by the Design-Builder. The testing results will be provided to the Owner.

(d) The Design-Builder will provide a DigiSCAN membrane integrity scan prior to installation of the electronic leak detection system. The scan will include the inside and outside corners of parapets and equipment curbs. The scan results / field reports will be provided to the Owner.

SCHEDULE 3

INSURANCE CONDITIONS

Without restricting the generality of the indemnification provisions in Section 57, insurance and coverage will be arranged and paid for as follows:

1. WRAP-UP LIABILITY INSURANCE

1.1 The Owner will provide, maintain and pay for Commercial General Liability Insurance with a limit of inclusive per occurrence, general aggregate for bodily injury, death, and damage to property including loss of use thereof, product/completed operations liability with a limit of annual aggregate.

1.2 This insurance will cover the Owner, the City of Vancouver, the Design-Builder & Subcontractors, Architects, Engineers, Consultants and anyone employed by them to perform a part or parts of the Work (includes both Construction and Design services, but excludes all professional services, under this Agreement) but excluding suppliers whose only function is to supply and/or transport products to the project site or security protection persons or organizations providing site protection on or at the insured project. The insurance does not extend to any activities, works, jobs or undertakings of the insureds other than those directly related to the Work of this Agreement.

1.3 The insurance will preclude subrogation claims by the insurer against anyone insured hereunder.

1.4 The insurance will include coverage for:

(a) Products or Completed Operations Liability ;

(b) Cross Liability (or Severability of Interests);

(c) Shoring, Blasting, Excavating, Underpinning, Demolition, Pile-driving and Caisson Work, Work Below Ground Surface, Tunneling and Grading, as applicable;

(d) Limited Pollution Liability

(e) Broad Form Tenants Legal Liability

(f) Operation of Attached Machinery; and

(g) Forest Fire Fighting Expenses

1.5 Any applicable deductibles will not exceed except with respect to loss or damage arising from hot roofing operations which will carry a deductible of .

1.6 If the project requires hot roofing work, the Design-Builder (or its Subcontractors) will provide, maintain and pay for a commercial general liability insurance in the amount of inclusive per occurrence against bodily injury and property damage. The Owner shall be added as an additional insured. Such insurance shall be primary and include, but not limited to:

(a) Premises and Operations Liability;

(b) Products and Completed Operations;

(c) Owner's and Contractor's Protective Liability;

(d) Blanket Written Contractual Liability;

(e) Contingent Employer's Liability;

(f) Personal Injury Liability;

(g) Non-Owned Automobile Liability;

(h) Cross Liability;

(i) Employees as Additional Insureds; and

(j) Broad Form Property Damage.

1.7 This insurance will be maintained continuously from commencement of the Work until Substantial Completion of the Project, plus cover completed operations for a further period of .

2. PROFESSIONAL LIABILITY INSURANCE

2.1 The Design-Builder or the Design-Builder's Consultant during the term of this Agreement will provide and maintain continuously from the commencement of the Work, until after Substantial Completion of the Project, the following insurance which will be placed with such company or companies and in such form and amounts and with such deductibles as may be acceptable to the Owner:

(a) Professional Errors and Omissions Liability Insurance protecting the Design-Builder or the Design-Builder's Consultant, Subcontractors and their respective servant(s), agent(s) or employee(s) against any loss or damage arising out of the Design under this Agreement. Such insurance will be for the adequate amount acceptable to the Owner and will in any event be not less than per occurrence.

(b) Structural, Mechanical, Electrical and Civil Subcontractors Insurance coverage is to be based on the value of their scope of work. All other specialty Subcontractors are to carry a minimum of Errors and Omissions Insurance despite the value of their scope of work.

(c) If coverage is provided by the Design-Builder's Consultant, then such Professional Errors and Omissions Liability Insurance will not contain a "**Design-Build**" exclusion.

3. PROPERTY COVERAGE INSURANCE

3.1 The Owner will provide, maintain and pay for Course of Construction coverage, against "**All Risks**" of direct physical loss or damage, and will cover all materials, property, structures and equipment purchased for, entering into, or forming part of the Work whilst located anywhere within Canada and continental United States of America (excluding Alaska) during construction, erection, installation and testing, but such coverage will not include coverage for Design-Builder's and Subcontractors' equipment of any description. Such coverage will be maintained until Substantial Completion of the Project. There will be a deductible of for each and every occurrence except for the peril of earthquake which will have a (subject to minimum) deductible based upon completed values at time of loss. A 1 day waiting period for each month of

the estimated project term subject to a minimum waiting period of 30 days will apply with respect to soft costs.

3.2 The coverage will include as a protected entity, each Design-Builder, Subcontractor, Architect or Engineer who is engaged in the Project.

3.3 The coverage will contain a waiver of the Owner's rights of subrogation against all protected entities except where a loss is deemed to have been caused by or resulting from any error in design or any other professional error or omission.

3.4 The Design-Builder will, at his own expense, take special precaution to prevent fires occurring in or about the Work and will observe, and comply with, all insurance policy warranties and all laws and regulations in force respecting fires.

4. AUTOMOBILE LIABILITY INSURANCE

4.1 The Design-Builder will provide, maintain and pay for, and require all Subcontractors to provide, maintain and pay for Automobile Liability Insurance in respect of all owned or leased vehicles if used directly or indirectly in the performance of the Work, subject to limits of not less than inclusive per occurrence. The insurance will be placed with such company or companies and in such form and deductibles as may be acceptable to Owner.

5. AIRCRAFT AND/OR WATERCRAFT LIABILITY INSURANCE

5.1 Where applicable, the Design-Builder (or the Design-Builder's Subcontractors) will provide, maintain and pay for liability insurance with respect to owned or non-owned aircraft and watercraft if used directly or indirectly in the performance of the Work, subject to limits of not less than inclusive per occurrence for bodily injury, death, and damage to property including loss of use thereof and including aircraft passenger hazard where applicable. The Owner must be included as an additional insured but only with respect to liability arising out of the Design-Builder's performance of the Agreement. The Insurance shall be placed with such company or companies and in such form and deductibles as may be acceptable to Owner.

6. CONTRACTORS POLLUTION LIABILITY INSURANCE

6.1 When applicable, the Design-Builder (or Design-Builder's Subcontractors) will require all Subcontractors to provide, maintain and pay for Contractors Pollution Liability, where the Design-Builder's performance (or Design-Builder's Subcontractor's performance) of the Work is associated with hazardous materials clean-up, removal and/or containment, transit and disposal. This insurance must have a limit of liability not less than inclusive per occurrence insuring against bodily injury, death, and damage to property including loss of use thereof. The Owner must be included as an additional insured but only with respect to liability arising out of the Design-Builder's performance of the Agreement. Such insurance shall not be impaired by any time element limitations to the pollution event, biological contaminants (without limitation, mould and bacteria), asbestos, or lead exclusions. Any "insured vs. insured" exclusion shall not prejudice coverage for the Owner and shall not affect the Owner's ability to bring suit against the Design-Builder as a third party.

If any such insurance is provided on a claims-made basis and that insurance is cancelled or not renewed, such policy must provide a extended reporting period.

7. GENERAL

7.1 The description of the Owner arranged insurance described herein is provided on a summary basis only and is not a statement of the actual policy terms and conditions. The Owner does not represent or warrant that the Owner arranged insurance contains insurance for any and all losses. It is the Design-Builder's responsibility to ascertain the exact nature and extent of coverage provided by the Owner arranged insurance, to review all policies pertaining thereto and to obtain any other insurance that it may be prudent for the Design-Builder to obtain.

7.2 The Design-Builder will also provide, maintain and pay for any other insurance that the Design-Builder is required by law to carry, or which the Design-Builder considers necessary.

7.3 Unless specified otherwise, the duration of each coverage and insurance policy will be from the date of commencement of the Work until the date of final certificate for payment.

7.4 The Owner will, upon request, provide the Design-Builder with proof of insurance of those coverages and insurances required to be provided by the Owner prior to commencement of the Work and subsequent certified copy of policies within a reasonable time period thereafter.

7.5 Any Design-Builder insurance required must be endorsed to provide the Owner with thirty (30) days advance written notice of cancellation, or adverse material change.

7.6 The Design-Builder and/or its Subcontractors, the Design-Builder's Consultant and sub-consultants as may be applicable, will be responsible for any deductible amounts under the policies of coverage and insurance except for perils of flood and earthquake.

7.7 The Design-Builder will provide the Owner with proof of insurance for those insurances required to be provided by the Design-Builder (or Design-Builder's Consultant) prior to the commencement of the Work in the form of a completed Certificate of Insurance and will also provide a certified copy of any required policies upon request. The Design-Builder must cause all Subcontractors or the Design-Builder's Consultant to comply with the insurance requirements outlined herein.

7.8 The Owner will not be responsible for injury to the Design-Builder's employees or for loss or damage to the Design-Builder's or to the Design-Builder's employees' machinery, equipment, tools or supplies which may be temporarily used or stored in, on or about the premises during construction and which may, from time to time, or at the termination of this Agreement, be removed from the premises. The Design-Builder hereby waives all rights of recourse against the Owner or any other contractor with regard to damage to the Design-Builder's property.

SCHEDULE 4

COMMUNICATION ROLES

The Owner and the Design-Builder will share responsibilities for communications, including community relations, stakeholder consultation, media relations and emergency communications on the terms set out in this Schedule.

1. GENERAL

1.1 The Design-Builder will be guided by the Owner's best practices regarding communications. Unless otherwise specified by the Owner, the governing document relating to best practices will be the disclosure guidance document entitled "Procurement Related Disclosure for Major Infrastructure Projects" posted at www.Partnershipsbc.ca.

1.2 The Design-Builder will consult and cooperate with the Owner regarding communications activities relating to the Project. The Design-Builder will not communicate with the media about the Project without the prior written approval by the Owner, which approval will be provided in the Owner's sole discretion on a case-by-case basis for each specific instance of communication.

1.3 The desired outcome of communications activities is to inform and involve the public and other stakeholders about the progress, value and benefits of the Project and to develop and maintain support for the Project.

1.4 Communications strategies and plans involving the interests of both parties are to be prepared on a joint basis, with one party taking a lead role and the other a supporting role, as described in this Schedule.

1.5 Where communications strategies and plans involve the interests of both parties, each party will give the other a reasonable opportunity (taking into account the need for timely communications) to consider communications strategies and plans initiated by the other and, if information is supplied by a party, it should include or be accompanied by sufficient explanatory or other material to enable the information to be properly considered.

1.6 The Design-Builder will consider and, acting reasonably, take into account, public and other stakeholder input in regard to its plans for the Design and Construction.

1.7 This Schedule is a guideline and may be amended by mutual agreement. Non-compliance with this Schedule by either party will not constitute a breach of this Agreement.

1.8 No communication regarding the subject matter of a Dispute, including one resolved under Section 62 (Dispute Resolution) of the Agreement, will be made without the prior written consent of the Owner or the Design-Builder, as the case may be, unless otherwise ordered under the Dispute resolution procedure.

1.9 The Design-Builder acknowledges that FIPPA applies to the Owner, that nothing in this Schedule limits any requirements for compliance with FIPPA and that the Owner may be required to make disclosure of information under FIPPA.

1.10 The Design-Builder acknowledges that the Owner will be free to disclose (including on Websites) this Agreement and any and all terms hereof, except for those portions that would not be required to be disclosed under FIPPA. The Owner will consult with the Design-Builder prior to such disclosure.

1.11 Except for Section 1.10, this Schedule is subject to the parties' obligations in respect of Confidential Information pursuant to Section 65 of this Agreement.

2. CATEGORIES OF COMMUNICATIONS

The following categories of communications are covered by this Schedule and each category applies during the Construction period:

(a) Communications Planning: the Design-Builder will be provided with a copy of parts of the Project Communications Plan prepared by the Owner and applicable to this Project and will support the implementation of the strategies and activities listed in it;

(b) Community Relations: keeping all key audiences including external and internal Project stakeholders (as identified in communications plans) informed, including providing overall Project information, including information about schedule, design, construction (including traffic management), facilities management and other services, using any and all appropriate communications tools and tactics;

(c) Consultation: engaging in discussions with Project stakeholders;

(d) Media Relations: providing media with Project updates and responding to issues raised by the media; and

(e) Emergency Communications: preparing and implementing crisis communications planning and preparedness.

3. LEAD AND SUPPORTING ROLES

3.1 Within each category of communications set out in Section 2 of this Schedule, the Design-Builder will play either a lead or supporting role, working with the Owner to achieve the desired communications outcomes.

3.2 For all categories of communication, and whether communication occurs as part of a lead or supporting role, no advertising that involves payment, by the Design-Builder, to a third party may include the Owner or the Project unless the Design-Builder obtains the prior consent of the Owner, not to be unreasonably withheld or delayed.

4. LEAD RESPONSIBILITIES

The following is an overview of the responsibilities associated with lead roles:

(a) developing an overall strategic communications plan for the Project, that includes plans for communications, community relations, consultation, media relations and emergency communications;

(b) having regard for the input of the supporting party, approving communication plans and tactics in response to specific circumstances, unless otherwise indicated in this Schedule;

(c) implementing its role in approved plans;

(d) achieving the outcomes set out in the strategic communication plan;

(e) maintaining constructive and positive relationships with the public and other stakeholders;

(f) providing information, as required by the supporting party and its team members, to support communication and consultation activities;

(g) as relevant to its lead role, organizing, attending and participating in community and other stakeholder consultation meetings and carrying out other communication activities to consult with and report back to the community and other stakeholders, including open houses, information updates, public displays, advertising, website creation, maintenance updates, construction notices, milestone celebration events, news releases and tours, and directing inquiries to the supporting party as appropriate;

(h) assuming responsibility for costs related to carrying out lead responsibilities to a standard acceptable to the Owner, in the amounts and in the manner approved by the Owner;

(i) monitoring whether the Design and Construction are conducted in a manner consistent with strategic communication plans and advising the parties of any material inconsistency; and

(j) having a trained media relations spokesperson available 24/7 to respond to media requests.

5. SUPPORTING RESPONSIBILITIES

The following is an overview of the responsibilities associated with supporting roles:

(a) assisting with the implementation of plans, including drafting of other communication documents, as directed by the lead party;

(b) implementing its role in approved plans;

(c) maintaining constructive and positive relationships with the public and other stakeholders;

(d) providing information, as required by the lead party and its team members, to support communication and consultation activities;

(e) as relevant to its supporting role, organizing, attending and participating in community and other stakeholder consultation meetings and carrying out other communication activities to consult with and report back to the community and other stakeholders, including open houses, information updates, public displays, advertising, website creation, maintenance updates, construction notices, milestone celebration events, news releases and tours, and directing inquiries to the lead party as appropriate;

(f) assuming responsibility for costs related to carrying out supporting responsibilities to a standard acceptable to the Owner, in amounts and in a manner approved by the Owner; and

(g) having a local, trained media relations spokesperson available 24/7 to respond to media requests.

6. ALLOCATION OF LEAD AND SUPPORTING ROLES

The lead and supporting roles will be allocated as set out in the following table, unless otherwise required by the Owner in consultation with the Design-Builder:

CATEGORY	LEAD	SUPPORTING
Communications Planning	Owner	Design-Builder
Community Relations	Owner	Design-Builder
Consultation	Owner	Design-Builder
Media Relations	Owner	Design-Builder
Emergency Communications Relating to existing Owner employees, programs, services and facilities and Design-Builder performance	Owner	Design-Builder
Emergency Communications related to Design-Builder Site health and safety	Design-Builder	Owner
Construction	Design-Builder	Owner
Moves	Owner	Design-Builder
Traffic	Design-Builder	Owner
Noise	Design-Builder	Owner

7. OWNER RIGHT TO STEP IN AT DESIGN-BUILDER'S COST

If the Design-Builder is required to take a lead role but fails to comply with its obligations under this Schedule in any material respect, the Owner may give reasonable notice to the Design-Builder that it intends to undertake and assume the lead role obligations of the Design-Builder as allocated in Section 6 of this Schedule, at the expense of the Design-Builder, including all direct costs of engaging third party assistance with communication responsibilities and all direct costs of the Owner in connection with fulfilling the Design-Builder's obligations under this Schedule.

SCHEDULE 5

KEY INDIVIDUALS

Individual's Name	Company Name	Role
	Bird Design-Build Construction Inc.	Design-Build Director
	Bird Design-Build Construction Inc.	Design-Build Construction Manager
	KMBR Architects Planners Inc.	Lead Architect
	Integral Group Inc.	Electrical Design Lead
	Integral Group Inc.	Mechanical Design Lead

SCHEDULE 6

SCHEDULE OF PRICES

The Contract Price represents the entire compensation to the Design-Builder by the Owner for any and all costs related to the Work, including but not limited to all fees, cash allowances, contingencies and all duties and taxes, excluding GST payable by the Owner to the Design-Builder.

The attached schedule is a breakdown of the Contract Price solely for the purpose of assisting the parties to develop the Schedule of Values, and will not be used or relied upon by the Design-Builder for any purpose.

Breakdown of Contract Price

	Value
HARD COSTS	
Division 1 - General Requirements	
Division 2 - Existing Conditions	
Division 3 - Concrete	
Division 4 - Masonry	
Division 5 - Metals	
Division 6 - Wood, Plastics, and Composites	
Division 7 - Thermal and Moisture Protection	
Division 8 - Openings	
Division 9 - Finishes	
Division 10 - Specialties	
Division 11 - Equipment	
Division 12 - Furnishings	
Division 13 - Special Construction	
Division 14 - Conveying Equipment	
Division 21 - Fire Suppression	
Division 22 and 23 - Common Requirements Mechanical	
Division 22 - Plumbing	
Division 23 - Heating, Ventilating, and Air Conditioning (HVAC)	
Division 24 - Major Equipment Performance Specification	
Division 25 - Integrated Automation	
Division 26 - Electrical	
Division 27 - Telecommunications and IT	
Division 28 - Electronic Safety and Security	
Division 31 - Earthworks	
Division 32 - Site Improvements	
Division 33 - Utilities On Site	
Hard Costs Sub-Total	

	Value
SOFT COSTS	
Architectural Design Fees	
Structural Design Fees	
Mechanical Engineering Design Fees	
Electrical Engineering Design Fees	
Civil Engineering Design Fees	
Geotechnical Engineering Design Fees	
Building Envelope Consultants Fees	
Landscape Architect Fees	
Code Consultant Fees	
Other Consultant - Specify	
Development Permit	
Building Permit	
Development Cost Charges	
Scored Elements - 4.1 a Incorporation of Musqueam Design Elements including items 1) - 3)	
Soft Costs Sub-Total	
GENERAL EXPENSE COSTS	
Pursuit Costs	
Mobilization	
Mockups	
Ongoing General Expenses	
Project Staff	
Project Overhead	
Construction Equipment	
Testing	
Bonding and Security	
Insurance	
General Expense Sub-Total	

	Value
Total Costs	
Auditorium Cash Allowance	
Fee	
Nominal Cost of the Proposal (Contract Price)	**$91,321,353**

Monthly Breakdown

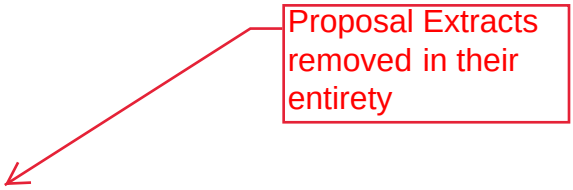
Period Ending	Expected Monthly Progress Payments	
28-Feb-20		
31-Mar-20		
30-Apr-20		
31-May-20		
30-Jun-20		
31-Jul-20		
30-Aug-20		
30-Sep-20		
31-Oct-20		
30-Nov-20		
31-Dec-20		
31-Jan-21		
28-Feb-21		
31-Mar-21		
30-Apr-21		
31-May-21		
30-Jun-21		
31-Jul-21		
30-Aug-21		

Period Ending	Expected Monthly Progress Payments	
30-Sep-21		
31-Oct-21		
30-Nov-21		
31-Dec-21		
31-Jan-22		
28-Feb-22		
31-Mar-22		
30-Apr-22		
31-May-22		
30-Jun-22		
31-Jul-22		
31-Aug-22		
30-Sep-22		
31-Oct-22		
30-Nov-22		
31-Dec-22		
31-Jan-23		
28-Feb-23		
31-Mar-23		
30-Apr-23		
31-May-23		
30-Jun-23		
31-Jul-23		
31-Aug-23		
30-Sep-23		
Nominal Cost of the Proposal	$	91,321,353

SCHEDULE 7

PROPOSAL EXTRACTS

See separate document.



SCHEDULE 8

APPRENTICESHIP POLICY

1. APPRENTICESHIP POLICY

1.1 The Design-Builder acknowledges that it has obtained a copy of and has reviewed the Ministry of Advanced Education, Skills & Training ("**AEST**") policy set out in Apprentices on Public Projects in British Columbia Policy and Procedure Guidelines, Date: July, 2015, Update: March, 2016 available at https://www2.gov.bc.ca/assets/gov/business/economic-development/assets/apprentices-on-public-projects/policy_and_procedure_guidelines.pdf (the "Apprenticeship Policy").

1.2 Unless defined in this Agreement, capitalized terms in this Schedule 8 have the meaning given in the Apprenticeship Policy.

2. APPLICATION

2.1 The Design-Builder agrees that the Apprenticeship Policy applies to this Agreement and the Design-Builder will, subject to the reasonable assistance of the Owner, comply with the requirements of the Apprenticeship Policy.

2.2 The Design-Builder agrees that the Owner requires the Design-Builder to apply the Apprenticeship Policy to Subcontractors and Subcontracts (of all tiers) valued at $500,000 or more.

3. REQUIREMENTS

3.1 The Design-Builder acknowledges that the requirements of the Apprenticeship Policy and this Schedule include:

(a) using Registered Apprentice(s) in respect of Specified Trades valued at $500,000 or more;

(b) reporting in Form A: Confirmation of Intent to Use Registered Apprentices as soon as practicable and at least 5 days prior to commencement of Work under this Agreement or work under the applicable Subcontract and completing all supplementary forms (Form A) as required;

(c) reporting in Form B: Apprentice Utilization Report quarterly and upon completion of Work under this Agreement or work under the applicable Subcontract; and

(d) complying with applicable requirements in relation to Personal Information.

3.2 The Design-Builder further acknowledges that under the Apprenticeship Policy the Owner may, or may permit AEST, to exercise all provisions of the Apprenticeship Policy applicable to the Owner or the Province (whether through AEST or otherwise) provisions that permit the Owner:

(a) to delay the start of Work on the Project until the Owner has confirmed, through AEST, that Registered Apprentices will be used on the Project; and

(b) to delay issue of final payment in relation to the applicable Work until the final Form B is submitted.

3.3 The Design-Builder represents that the Design-Builder will ensure that the provisions of this Schedule 8 are incorporated into applicable Subcontracts.

3.4 The Design-Builder and the Owner acknowledge that any change to the Apprenticeship Policy will, if required by the Owner to be implemented for purposes of this Agreement, be implemented as a Change under Part E – Changes.

SCHEDULE 9

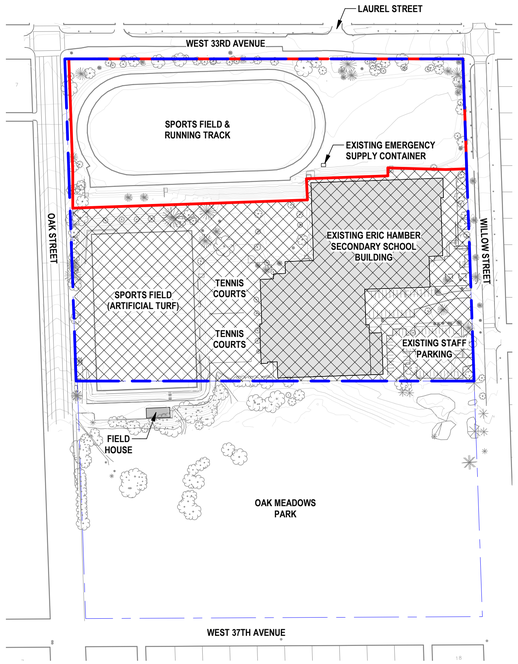
SITE PLAN

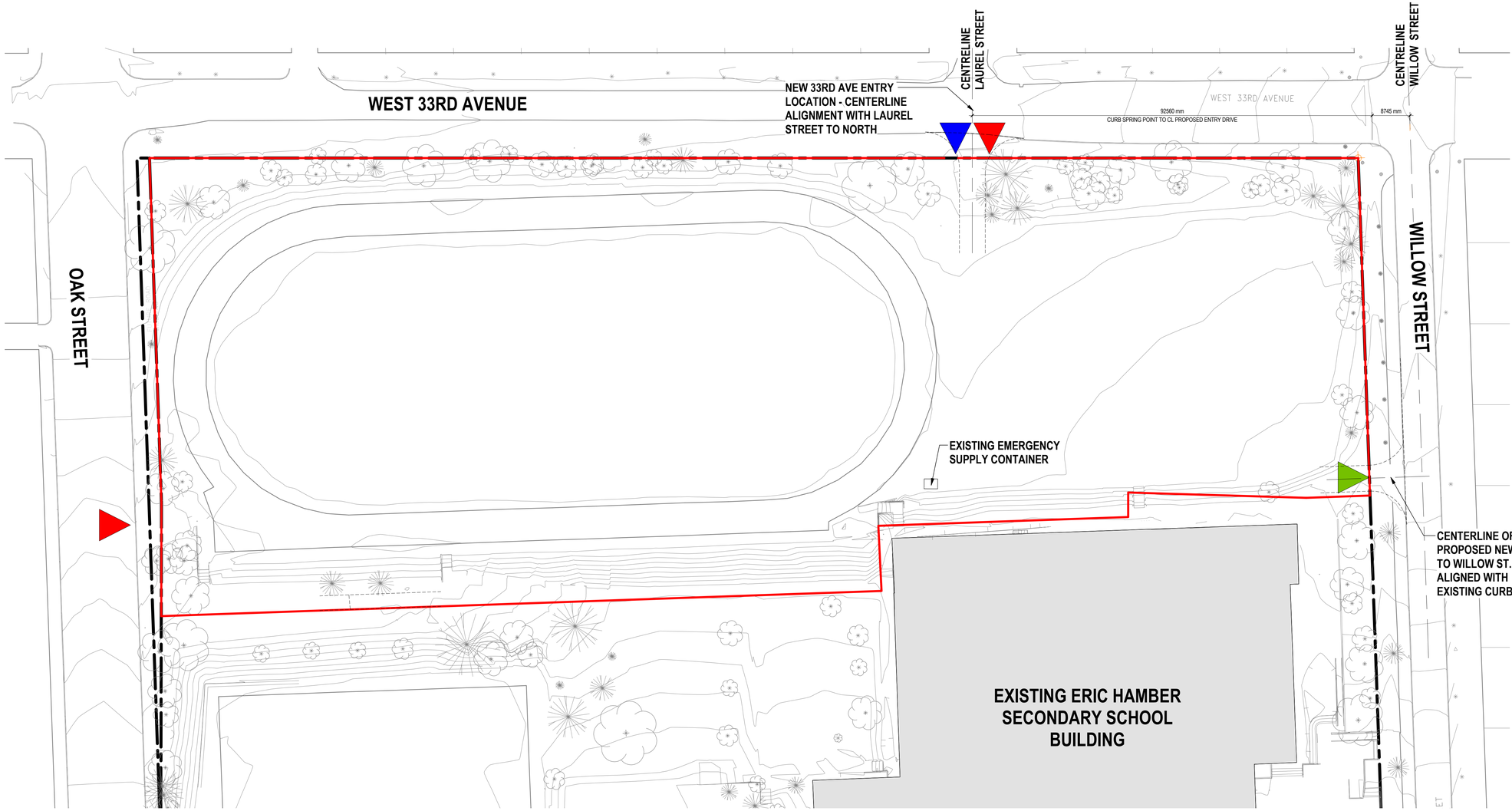
See separate document.

Stantec

LEGEND:

- SITE BOUNDARY
- LANDS BOUNDARY
- EXISTING SCHOOL
- SCHOOL MAIN ENTRANCE FROM WEST 33RD AVENUE
- SITE ACCESS DURING CONSTRUCTION
  * ACCESS FROM OAK STREET WITH THE FOLLOWING RESTRICTIONS:
  - NO SOUTHBOUND ACCESS OFF OAK STREET
  - NORTHBOUND ACCESS VIA A RIGHT HAND TURN
  - SUBJECT TO CONFIRMATION AT TIME OF DESIGN-BUILDER'S APPLICATION
- NEW EXIT





KEY PLAN
1 : 2000

1. SCHEDULE 9 - SITE PLAN
1 : 500

115618194

NOT FOR CONSTRUCTION

SCHEDULE 10

CLEANING AND WASTE MANAGEMENT

The Design-Builder will:

(a) maintain the Work and all roadways, pathways and other transportation routes that may be impacted by construction, in a tidy condition and free from the accumulation of waste products and debris, other than that caused by the Owner, Other Contractors or their employees;

(b) promptly remove all surplus products, tools, construction machinery and equipment, and any waste and debris

(c) provide to the Owner advance notice prior to commencing final cleaning activities;

(d) leave the Facility and the Site clean and suitable for occupancy and use by the Owner by the Substantial Completion Date;

(e) remove surplus products, materials, tools, temporary facilities, construction machinery and equipment not required for performance of remaining Work;

(f) remove waste products and debris other than that caused by the Owner, Other Contractors or their employees;

(g) remove waste materials from site at regularly scheduled times or dispose of as directed by the Owner's Consultant;

(h) make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris;

(i) clean and polish surface finishes, as recommended by product manufacturer;

(j) remove grease, paint spots, dirt, dust, stains, labels, fingerprints and other foreign matter from interior and exterior surfaces;

(k) leave all surfaces in perfectly clean and unsoiled condition;

(l) close, isolate or lock areas after cleaning to avoid the need to re-clean;

(m) at a minimum, clean exterior elements as follows:

(i) clean horizontal and vertical surfaces;

(ii) clean equipment and fixtures;

(iii) vacuum and dust behind grilles, louvres and screens;

(iv) broom clean and wash exterior walks, steps, surfaces, and rake the site clean.

(v) remove debris and surplus materials from crawl areas and other concealed spaces;

(vi) remove dirt and other disfiguration from exterior surfaces;

(vii) clean roof surfaces, gutters, downspouts, drainage components, and sunken wells;

(viii) remove temporary labels;

(ix) polish transparent and glossy surfaces; and

(x) clean and polish exterior glass, hardware, wall finishes, handrails and guardrails;

(n) at a minimum, clean interior elements as follows:

(i) perform cleaning in accordance with a typical commercial cleaning regimen;

(ii) vacuum floors and horizontal surfaces;

(iii) wash floor surfaces not otherwise finished; clean metal doors and frames;

(iv) vacuum and dust behind grilles, louvres and screens;

(v) clean and polish interior glass, mirrors, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and handrails and guardrails;

(vi) remove temporary labels, stains, and foreign substances;

(vii) ensure tile grout is sealed, then clean floor and wall tile;

(viii) clean mechanical fixtures, electrical fixtures, and other equipment including lighting reflectors, lenses, and other lighting surfaces;

(ix) replace filters in mechanical equipment and any air conditioning units after completion of air balancing; and

(x) clean interior surfaces of supply air plenums, air handling units and unit-ventilators after balancing to remove all dust;

(o) at a minimum, for floor finishing, undertake the following:

(i) where flooring materials carry a manufacturer's recommendation requiring the application of a finish, ensure the Owner provides prior approval of both the product and application method;

(ii) once approved, apply four coats of approved finish;

(iii) apply the first two coats of finish staying 15 – 20 cm away from the walls;

(iv) apply the final two coats wall to wall; and

(v) keep baseboards, wall surfaces, millwork, mouldings, doors and frames, door and sidelight glass, and all other surfaces in the room free of any floor finish; and

(p) request that the Owner review the cleanliness of the Facility and the Site prior to occupancy.