Confidential

Execution Version

DESIGN-BUILD AGREEMENT

George Pringle Secondary School Project

The Board of Education of School District No. 23 (Central Okanagan)

_____

and

Clark Builders (British Columbia) Inc.

_____

Dated: February 22, 2024

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DESIGN-BUILD AGREEMENT

THIS AGREEMENT dated for reference as of February 22, 2024 (the "***Effective Date***") is entered into:

BETWEEN:

The Board of Education of School District No. 23 (Central Okanagan)

(the "***Owner***")

AND:

Clark Builders (British Columbia) Inc.

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

WHEREAS:

A. The Owner has selected the Design-Builder to perform all Work for the Project referred to as the "George Pringle Secondary School 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 covenants and agreements of the parties contained in this Agreement and other good and valuable consideration, the receipt and sufficiency of which are hereby expressly acknowledged by each of the parties hereto, the parties covenant and 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:

"**21st Century Learning**" has the meaning set out in the Statement of Requirements;

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

"**Airtightness Integrity Supervisor**" has the meaning set out in Schedule 8 – Energy;

"**Airtightness Test Report**" has the meaning set out in Schedule 8 – Energy;

"**Airtightness Testing Plan**" has the meaning set out in Schedule 8 – Energy;

"**Ancillary Software Service Agreement**" means:

(a) an agreement for the provision of services (including maintenance services and technical support services) relating to a COTS Software Product; and

(b) an escrow agreement (if entered into by the Design-Builder in its discretion) for Source Code Materials relating to a COTS Software Product;

"**Apprenticeship Policy**" has the meaning set out in Schedule 9 – Apprenticeship Policy;

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

"**Authority Having Jurisdiction**" or "**AHJ**" means any federal, provincial, territorial, regional, municipal or local governmental authority, quasi-governmental authority, court, government or self-regulatory organization, commission, board, tribunal, or any regulatory, administrative or other agency, or any political or other subdivision, department or branch of any of the foregoing, having jurisdiction in any way over or in respect of any aspect of the performance of this Agreement or the Project;

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

"**BMS**" has the meaning set out in the Statement of Requirements;

"**Bonds**" has the meaning set out in Section 60.1;

"**Building**" has the meaning set out in the Statement of Requirements;

"**Building Envelope Thermal Bridging Guideline**" or "**BETBG**" has the meaning set out in Schedule 8 – Energy;

"**Building Performance Professional**" has the meaning set out in Schedule 8 – Energy;

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

"**Carbon Tax**" has the meaning set out in Schedule 8 – Energy;

"**Category A FFE**" has the meaning set out in the Statement of Requirements;

"**Category B FFE**" has the meaning set out in the Statement of Requirements;

"**Category C FFE**" has the meaning set out in the Statement of Requirements;

"**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;

"**Code of Conduct**" means the Design-Builder code of conduct set out in Schedule 12 – Code of Conduct;

"**Commissioning**" means inspection and testing of the Facility, including all equipment, products, components, systems and sub-systems, for the purpose of verifying the performance of the Facility, including all equipment, products, components, systems and subsystems, and confirming that the Facility complies with the requirements of this Agreement, including the Statement of Requirements, and all applicable Laws and Standards, and "**Commission**" has a corresponding meaning;

"**Commissioning Plan**" has the meaning set out in Section 33.1;

"**Commissioning Test Report**" has the meaning set out in Section 33.4;

"**Commissioning Work**" means all of the work, activities and tasks required to completely and successfully Commission the Facility, including all equipment, products, components, systems and subsystems;

"**Communications Rooms**" has the meaning set out in the Statement of Requirements;

"**Component**" or "**Functional Component**" has the meaning set out in the Statement of Requirements;

"**Confidential Information**" means Owner Confidential Information or Design-Builder Confidential Information, as applicable;

"**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:

(i) the time within which the Design-Builder will achieve Substantial Completion of the Building as set out in Section 3.1; and

(ii) the time within which the Design-Builder will achieve Substantial Completion of the Project as set out in Section 3.1;

"**COTS Software Product**" means a generally commercially available, off-the-shelf software product that is not owned by the Design-Builder or a Subcontractor;

"**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 Provide**r" has the meaning set out in Section 12.2;

"**Data Drop**" has the meaning set out in the Statement of Requirements;

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

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

"**Design-Builder Confidential Information**" means any:

(i) proprietary information, trade secrets and know-how relating to the Design-Builder's products, equipment, processes or methods which the Design-Builder expressly identifies in writing as confidential at the time of disclosure; and

(ii) financial information of the Design-Builder,

that is supplied, or to which access is granted, to the Owner (whether before or after the Effective Date), either in writing, or in any other form, directly or indirectly pursuant to, or in connection with, this Agreement;

"**Design-Builder Person**" means any Subcontractor (including the Design-Builder's Consultant), any director, officer, employee, worker, agent, representative (including the Design-Builder's Representative) or consultant of the Design-Builder or of a Subcontractor and anyone else for whose acts the Design-Builder may be liable.

"**Design-Builder's Consultant**" means studioHub Architects Ltd. 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 Design, including the Design Submittals, or to otherwise consult to the Design-Builder on the Project;

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

"**Design Life**" has the meaning set out in the Statement of Requirements;

"**Design Submittal**" means a Drawing or Specification, or any other Submittal or package of Submittals, including the Energy Model, prepared by or for the Design-Builder and illustrating the Design or any portion of the Design;

"**Direct Visual Connection**" has the meaning set out in the Statement of Requirements;

"**Disclosed Data**" means any information, data and documents (including in PLS-CADD or any other electronic format) made available or issued to the Design-Builder or any Design-Builder Person in connection with the Project by or on behalf of the Owner, including any information relating to the Land or the requirements of any Authority Having Jurisdiction, before 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;

"**Dispute Resolution Procedure**" has the meaning set out in Section 63.1;

"**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;

"**Electricity Emissions Intensity Factor**" has the meaning set out in Schedule 8 – Energy;

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

"**Energy**" has the meaning set out in Schedule 8 – Energy;

"**Energy and Greenhouse Gas Emissions Guarantee**" has the meaning set out in Schedule 8 – Energy;

"**Energy Cost**" has the meaning set out in Schedule 8 – Energy;

"**Energy Model**" has the meaning set out in Schedule 8 – Energy;

"**Energy Modelling Report**" has the meaning set out in Schedule 8 – Energy;

"**Energy Modelling Software**" has the meaning set out in Schedule 8 – Energy;

"**Energy Target**" has the meaning set out in Schedule 8 – Energy;

"**Entrance Facility**" has the meaning set out in the Statement of Requirements;

"**Environmental Credit**" has the meaning set out in Schedule 8 – Energy;

"**Environmental Report**" has the meaning set out in Section 30.2(a);

"**Epidemic**" means an epidemic or pandemic of infectious disease of humans, including one that is either declared by the World Health Organization or a "regional event" as defined in the *Public Health Act* (British Columbia) for which the Provincial Health Officer gives notice under Section 52 of that act, and including the COVID-19 Pandemic;

"**Epidemic Change in Law**" means a change to applicable Laws or Standards which in respect of an Epidemic imposes, modifies or removes measures to minimize or mitigate the spread of, and human health effects from, relevant infectious disease;

"**Epidemic Event**" means an event, other than an Epidemic Change in Law, arising after the Financial Submission Date and caused by an Epidemic;

"**Equivalent**" means any design, methodology, configuration, standard, material, product, component or equipment which:

(i) is not in accordance with the applicable design, methodology, configuration, standard, material, product, component or equipment specified in the Statement of Requirements;

(ii) has equal or better qualities and performance as the design, methodology, configuration, standard, material, product, component or equipment specified in the Statement of Requirements; and

(iii) has been accepted by the Owner's Representative in accordance with Section 16.5;

"**Existing Gymnasium**" has the meaning set out in the Statement of Requirements;

"**Existing Gymnasium Parking**" has the meaning set out in Section 25.2;

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

"**FFE**" has the meaning set out in the Statement of Requirements;

"**Final Airtightness Test**" has the meaning set out in Schedule 8 – Energy;

"**Financial Submission Date**" means November 29, 2023;

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

"**Force Majeure**" means Epidemic Events, labour disputes, strikes, lock-outs, fire, tornadoes, overland floods, earthquakes, hurricanes, unusual delay by common carriers or unavoidable casualties or, without limiting any of the foregoing, by 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, unless and to the extent caused by an Epidemic Event;

(v) unavailability of materials, unless and to the extent caused by an Epidemic Event;

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

(vii) delays resulting from adverse weather conditions, unless and to the extent that such adverse weather conditions directly give rise to a declaration of a state of emergency by the Province of British Columbia pursuant to section 9 of the *Emergency Program Act* (British Columbia); and

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

"**FortisBC**" means FortisBC Energy Inc. or any affiliate thereof;

"**Gathering Stair**" has the meaning set out in the Statement of Requirements;

"**Gender Neutral**" has the meaning set out in the Statement of Requirements;

"**Good Industry Practice**" means using standards, practices, methods and procedures to a good commercial standard, conforming to Laws and Standards and exercising that degree of skill and care, diligence, prudence and foresight which would reasonably and ordinarily be expected from a qualified, skilled and experienced person engaged in a similar type of undertaking under the same or similar circumstances;

"**Greenhouse Gas**" or "**GHG**" has the meaning set out in Schedule 8 – Energy;

"**Greenhouse Gas Emissions**" or "**GHG Emissions**" has the meaning set out in Schedule 8 – Energy;

"**Greenhouse Gas Emissions Intensity**" or "**GHGI**" has the meaning set out in Schedule 8 – Energy;

"**Greenhouse Gas Emissions Intensity Target**" has the meaning set out in Schedule 8 – Energy;

"**Gross Square Metre**" or "**GSM**" has the meaning set out in the Statement of Requirements;

"**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 31.5;

"**Indemnified Parties**" has the meaning set out in Section 58.1;

"**Independent Commissioning Agent**" has the meaning set out in Section 33.3;

"**Independent Energy Consultant**" has the meaning set out in Schedule 8 – Energy;

"**Indicative Design**" has the meaning set out in the Statement of Requirements;

"**Indigenous Businesses**" or "**Indigenous Business**" has the meaning set out in Schedule 11 – Quarterly Labour Reporting;

"**Infringement Allegation**" means a proven or unproven allegation or claim that the creation, possession, provision or Use of Project Intellectual Property misappropriates, infringes or violates the Intellectual Property or other rights of any person;

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

"**Intellectual Property**" means any or all of the following and all rights arising out of or associated therewith:

(a) national, international and foreign patents, utility models, mask works, and applications therefor and all reissues, divisions, renewals, extensions, provisionals, continuations and continuations-in-part thereof;

(b) inventions (whether patentable or not), invention disclosures, improvements, trade secrets, proprietary information, confidential information, trade or business names, knowhow, technology, technical data and customer lists, product formulations and specifications, and all documentation relating to any of the foregoing throughout the world;

(c) copyrights, copyright registrations and applications therefor, and all other rights corresponding thereto throughout the world;

(d) industrial designs, integrated circuit topography rights and any registrations and applications therefor throughout the world;

(e) rights in any internet uniform resource locators (URLs), domain names, trade names, logos, slogans, designs, common law trademarks and service marks, trademark and service mark registrations and applications therefor throughout the world;

(f) data bases and data collections and all rights therein throughout the world;

(g) moral and economic rights of authors and inventors, however denominated, throughout the world; and

(h) any similar or equivalent rights to any of the foregoing anywhere in the world;

"**Intersection Upgrade Cash Allowance**" has the meaning set out in Section 46.9;

"**Intersection Upgrade Work**" has the meaning set out in Section 46.9;

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

"**Land**" means, collectively, the lands legally described as PLAN KAP82274 LOT 1 DISTRICT LOT 486 OSOYOOS DIV OF YALE DISTRICT, PID 026-863-740, 3770 ELLIOTT RD, WEST KELOWNA, BC and PLAN KAP82274 LOT 2 DISTRICT LOTS 486 AND 807 OSOYOOS DIVISION YALE DISTRICT, PID 026-863-758;

"**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 43.1.

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

"**Local Area Network**" or "**LAN**" has the meaning set out in the Statement of Requirements;

"**Lock**" means a "time bomb", "logic bomb", "back door", "drop-dead device" or any other disabling or limiting code, design or routine that may be used to interrupt, lock, disable, erase, limit the functionality of, limit or prevent access to or Use of, or otherwise adversely affect, or facilitate unauthorized access to, a software product or related documentation or any computer system, hardware, software, or equipment on which the software product or documentation is installed or operated or any related data;

"**Main Telecommunications Room**" or "**MTR**" has the meaning set out in the Statement of Requirements;

"**Mechanical Engineer**" has the meaning set out in Schedule 8 – Energy;

"**Mid-Construction Airtightness Test**" has the meaning set out in Schedule 8 – Energy;

"**Modelled Floor Area**" or "**MFA**" has the meaning set out in Schedule 8 – Energy;

"**MOTI**" has the meaning set out in Section 46.9;

"**Natural Gas Emission Factor**" has the meaning set out in Schedule 8 – Energy;

"**Natural Light**" has the meaning set out in the Statement of Requirements;

"**Neighbourhood Learning Centre**" has the meaning set out in the Statement of Requirements;

"**Net Area**" or "**Net Square Metres**" or "**NSM**" has the meaning set out in the Statement of Requirements;

"**Notice of Dispute**" has the meaning set out in Section 63.2;

"**Occupant**" has the meaning set out in the Statement of Requirements;

"**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;

"**Other Groups**" has the meaning set out in Schedule 11 – Quarterly Labour Reporting;

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

"**Owner Confidential Information**" means any information of the Owner which is supplied, or to which access is granted, to the Design-Builder or any Design-Builder Person (whether before or after the Effective Date), either in writing, or in any other form, directly or indirectly pursuant to, or in connection with, this Agreement and includes the Disclosed Data, the Submittals and all analyses, compilations, studies and other documents whether prepared by or on behalf of the Owner or the Design-Builder which contain or otherwise reflect or are derived from such information;

"**Owner's Consultant**" means Station One Architects unless replaced in accordance with Section 5.5;

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

"**Particulate Matter Emissions**" or "**$PM_{2.5}$**" has the meaning set out in Schedule 8 – Energy;

"**Payee**" has the meaning set out in Section 1.3(o);

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

"**Payor**" has the meaning set out in Section 1.3(o);

"**Performance Holdbacks**" has the meaning set out in Section 43.1;

"**PIP General License**" means the license in respect of Project Intellectual Property granted by the Design-Builder and any Subcontractors to the Owner pursuant to Section 18.7(b);

"**Process Load**" has the meaning set out in Schedule 8 – Energy;

"**Professional Engineer**" means a professional engineer registered and in good standing under the *Professional Governance 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 45.1;

"**Project Credits**" means any incentive, income, credit, rebate, right, benefit or advantage provided by an Authority Having Jurisdiction, utility company 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 Intellectual Property**" means the Intellectual Property which is created, brought into existence, acquired, licensed or used by the Design-Builder, any Subcontractor or any other third party, directly or indirectly, for the purposes of the Design or Construction of the Facility, the inspection, testing, Commissioning or operation of the Facility, or otherwise for the purposes of this Agreement;

"**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 under the Review Procedure and that the Design-Builder is entitled to proceed with under the Review Procedure;

"**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;

"**Public Plaza**" has the meaning set out in the Statement of Requirements;

"**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;

"**Quarterly Labour Report**" means a report in the form set out in Schedule 11 – Quarterly Labour Reporting or such other form as may be required by the Owner from time to time;

"**Quarterly Labour Reporting Requirements**" means the reporting requirements set out in Schedule 11 – Quarterly Labour Reporting;

"**Record Drawings**" means the Drawings and Specifications that record the completed Facility, including the as-constructed or as-implemented information with respect to the Work;

"**Renewable Energy Electricity Generation**" has the meaning set out in Schedule 8 – Energy;

"**Responsible Ministry**" has the meaning set out in Section 3.2 of Schedule 9 – Apprenticeship Policy;

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

"**Room Data Sheets**" has the meaning set out in the Statement of Requirements;

"**Schedule of Values**" means the schedule to be provided by the Design-Builder pursuant to Section 40.4 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**" has the meaning set out in the Statement of Requirements;

"**Senior Management Representatives**" has the meaning set out in Section 63.4;

"**Separately Licensed IP**" has the meaning set out in Section 18.8;

"**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 25.2;

"**Site Occupation Date**" means the date that is the third Business Day after the Effective Date unless otherwise agreed by the Owner and the Design-Builder;

"**Site Plan**" means the plan of the Site attached as Schedule 10 to this Agreement;

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

(i) Memo Elliott Road Transportation Review dated July 30, 2021;

(ii) Memo Site Servicing Review Elliott Road - George Pringle dated July 30, 2021;

(iii) Geotechnical Report 20.005-GP dated July 26, 2021;

(iv) Geotechnical Memorandum 0.005-GP dated July 22, 2022;

(v) Geo Borehole Layout - George Pringle dated January 26, 2023;

(vi) Thermal Property Test Report - George Pringle January 23, 2023; and

(vii) George Pringle Secondary Traffic Count Report dated September 11, 2023;

"**SLIP License**" has the meaning set out in Section 18.8(a);

"**Source Code Materials**" means in relation to an item of computer software: (a) a complete copy of the source code (human readable code) for the software item stored on CD ROM or other commercially available permanent media; and (b) all developer documentation (including instructions, programmer specifications, notes, explanations, general flowcharts, input and output layouts, field descriptions, volumes and sort sequences, data dictionaries, file layouts, calculation formulae, details of algorithms and software or developer's tools) as may be reasonably necessary to permit a reasonably skilled programmer having a reasonable level of experience with the relevant computer environment and software applications to understand and Use the Source Code Materials to maintain, modify and enhance the software item and compile and generate a machine executable (object code) and acceptable form of the software item from the source code;

"**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;

"**Staff**" has the meaning set out in the Statement of Requirements;

"**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 Design Submittals, including the Drawings, Specifications, and the Energy Model and Energy Modelling Report, and other items, documents and anything else required or specified by this Agreement (including by Section 17), and any and all subsequent revisions, amendments and changes thereto, in respect of the Work, 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 the Review Procedure;

"**Substantial Completion**" means "Substantial Completion of the Building", unless "Substantial Completion" is expressly indicated to refer to "Substantial Completion of the Project";

"**Substantial Completion (Building) Deficiency List**" has the meaning set out in Section 44.4(b);

"**Substantial Completion (Project) Deficiency List**" has the meaning set out in Section 44.4(b);

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

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

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

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

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

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

"**Substantial Completion Deficiency List**" means the Substantial Completion (Building) Deficiency List or the Substantial Completion (Project) Deficiency List, as applicable, and "Substantial Completion Deficiency Lists" means both of the Substantial Completion (Building) Deficiency List and the Substantial Completion (Project) Deficiency List;

"**Substantial Completion of the Building**" has the meaning set out in Section 44.2;

"**Substantial Completion of the Project**" has the meaning set out in Section 44.3;

"**Target Building Substantial Completion Date**" has the meaning set out in Section 3.1(a);

"**Target Project Substantial Completion Date**" has the meaning set out in Section 3.1(b);

"**Telecommunications Room**" or "**TR**" has the meaning set out in the Statement of Requirements;

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

"**Thermal Energy Demand Intensity**" or "**TEDI**" has the meaning set out in Schedule 8 – Energy;

"**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 44.12;

"**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;

"**Total Energy Use Intensity**" or "**TEUI**" has the meaning set out in Schedule 8 – Energy;

"**Total Energy Use Intensity Target**" has the meaning set out in Schedule 8 – Energy;

"**U x A**" has the meaning set out in Schedule 8 – Energy;

"**U x A Calculation**" has the meaning set out in Schedule 8 – Energy;

"**U x A Target**" has the meaning set out in Schedule 8 – Energy;

"**US Army Corps of Engineers Air Leakage Test Protocol for Building Envelopes**" has the meaning set out in Schedule 8 – Energy;

"**Use**" means, with respect to any Intellectual Property, to do any and all things with that Intellectual Property that the owner of that Intellectual Property therein could do, including to install, load, transmit, access, execute, operate, use, host, store, back-up, archive, display, copy, reproduce, adapt, configure, translate, support, maintain, modify, enhance, implement, distribute, incorporate into other materials, create derivative works from, practice, construct, manufacture, make and have made, in any format now known or later devised and for any and all purposes, including operational, training, development, testing and enhancement purposes, but (i) specifically excluding the right to file for or seek to protect or enforce any patent, copyright or other intellectual property right in respect of such Intellectual Property, and (ii) subject to any limitations and restrictions expressly set forth in this Agreement, and "**Used**" and "**Using**" shall have corresponding meanings;

"**User Consultation Group**" has the meaning set out in Section 4 of the Review Procedure;

"**VanIAC**" has the meaning set out in Section 63.5;

"**VanIAC Rules**" has the meaning set out in Section 63.5;

"**Warranty Holdback**" has the meaning set out in Section 43.1;

"**Warranty Period**" means the period defined in Section 38.1 during which the Design-Builder is required to repair any deficiencies or defects that arise in the Work;

"**Weather Data**" has the meaning set out in Schedule 8 – Energy;

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

"**Work Plan**" has the meaning set out in Section 25.2; 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 – Energy;

(i) Schedule 9 – Apprenticeship Policy;

(j) Schedule 10 – Site Plan;

(k) Schedule 11 – Quarterly Labour Reporting; and

(l) Schedule 12 – Design-Builder Code of Conduct.

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 this 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 including "they", "them" and "their", which may import the plural include the singular and vice versa;

(j) words which may import gender are interpreted as gender neutral;

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

(l) 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;

(m) 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;

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

(o) 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;

(p) 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;

(q) 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 Design-Builder Persons;

(r) 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;

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

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

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

(v) 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;

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

(x) 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;

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

(z) 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;

(aa) 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 Design-Builder Persons;

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

(cc) 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;

(dd) 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;

(ee) 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;

(ff) the words "herein", "hereof", "hereto" and "hereunder" refer to this Agreement as a whole and not to a particular Section or Schedule in which such word may be used;

(gg) a reference to a person includes an individual, legal personal representative, corporation, body corporate, legal entity, firm, partnership, trust, trustee, syndicate, joint venture, limited liability company, association, unincorporated organization, union or Authority Having Jurisdiction; and

(hh) all of the Owner's payment obligations are expressly set out in this Agreement and no obligation of the Owner to reimburse or pay any amount to the Design-Builder will be implied by the use or absence of expressions such as "at the Design-Builder's expense", "at its own expense", "the Design-Builder will at its cost" or "the Design-Builder will bear the sole cost and expense of", in connection with particular obligations or responsibilities of the Design-Builder.

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 individuals executing this Agreement on behalf of the parties;

(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.

Upon becoming aware of a conflict within the documents forming this Agreement, the Owner will direct the Design-Builder as to which provision is to prevail in the circumstances, and for clarity, provided that the Owner's direction is consistent with this Section 1.5, the Design-Builder will not be 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 such direction or the conflict.

For purposes of determining whether a conflict exists between the Proposal Extracts and any other provisions of this Agreement, to the extent that the Proposal Extracts, include additional requirements for higher standards of quality or performance or additional requirements for more extensive scope of design, work or services than otherwise required, no such conflict will be deemed to exist and the Design-Builder's obligations hereunder will include compliance with all such additional requirements.

Notwithstanding that deficiencies may exist in the Proposal Extracts, the Design-Builder continues to be fully bound to perform all of its obligations under this Agreement. The Owner, the Owner's Representative, the Owner's Consultant or any person on behalf of the Owner is not responsible for identifying deficiencies in the Proposal Extracts, and irrespective of whether the Owner, the Owner's Representative, the Owner's Consultant or any person on behalf of the Owner has identified or has failed to identify any such deficiencies; the Design-Builder is not relieved in any way from meeting all of the requirements of this Agreement, including the Statement of Requirements.

PART B – PRICE, TIME, TERM

2. CONTRACT PRICE

2.1 The Owner will pay the total Contract Price of $97,636,563 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:

(a) Substantial Completion of the Building on or before February 28, 2027 (the "***Target Building Substantial Completion Date***");

(b) Substantial Completion of the Project on or before April 30, 2027 (the "***Target Project Substantial Completion Date***"); and

(c) Total Completion on or before the date that is 60 days after Substantial Completion of the Project.

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 Delay Liquidated Damages

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

(i) per day for each and every day after the Target Building Substantial Completion Date that Substantial Completion of the Building is not achieved (or if the Owner has extended the Contract Time in accordance with this Agreement, such other date established for the Target Building Substantial Completion Date);

(ii) if Substantial Completion of the Building has not been achieved by the day that is 60 days after the Target Building Substantial Completion Date (or if the Owner has extended the Contract Time in accordance with this Agreement, such other date established for the Target Building Substantial Completion Date), a lump sum of ; and

(iii) if Substantial Completion of the Building has not been achieved by the day that is 90 days after the Target Building Substantial Completion Date (or if the Owner has extended the Contract Time in accordance with this Agreement, such other date established for the Target Building Substantial Completion Date), a further lump sum of .

For clarity, the lump sum liquidated damages amounts under Sections 3.3(a)(ii) and 3.3(a)(iii) are in addition to the daily liquidated damages amount under Section 3.3(a)(i) which will continue to apply until the Substantial Completion Date for the Building.

(b) If the Design-Builder fails to achieve Substantial Completion of the Project on or before the Target Project Substantial Completion Date and the Owner has not extended the Contract Time 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 per day for each and every day after the Target Project Substantial Completion Date that Substantial Completion of the Project is not achieved (or if the Owner has extended the Contract Time in accordance with this Agreement, such other date established for the Target Project Substantial Completion Date).

(c) During any period of time when both Section 3.3(a) and Section 3.3(b) apply, the aggregate daily liquidated damages under Section 3.3(a)(i) and Section 3.3(b) will be limited to the sum of per day.

(d) The maximum aggregate amount of the liquidated damages pursuant to this Section 3.3 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 of the Building by the Target Building Substantial Completion Date and for the failure to achieve Substantial Completion of the Project by the Target Project 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 amounts in Section 3.3 represent genuine pre-estimates of the damages and expenses that the Owner is likely to incur for such failure to meet the Target Building Substantial Completion Date or the Target Project Substantial Completion Date, as applicable, and both parties expressly agree that such amounts are not a penalty. The Owner may, in its discretion, either deduct the daily sums and the lump 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 44.13; and

(c) the Design-Builder has fulfilled all of its obligations pursuant to Section 38.

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

(b) recommending to reject Work which does not conform to the requirements of this Agreement;

(c) recommending to test and inspect the Construction, whether or not such Construction has been fabricated, installed, or completed;

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

(e) providing advice to the Owner and the Payment Certifier on the Design-Builder's applications for release of the Performance Holdbacks;

(f) reviewing any incomplete Work and any defects and deficiencies in the Work at Substantial Completion of the Building and Substantial Completion of the Project and any defects and deficiencies during the Warranty Period, and issuing appropriate instructions for the completion or correction of same; and

(g) 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 any 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 amounts owing to the Design-Builder based on the Payment Certifier's and the Owner's Consultant'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 the certificates for same;

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

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

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

(f) 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 perform, or engage a new Payment Certifier to perform, 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 Work 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 duties described in this Agreement, including Schedule 5 – Key Individuals; and

(b) if for any reason a Key Individual resigns or is otherwise unavailable to perform the duties described in Schedule 5 – Key Individuals then the Design-Builder will use all reasonable efforts to retain a replacement with equal or better qualifications, 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;

(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; and

(c) promptly submit information, including the qualifications, expertise and experience of the proposed replacement to the Owner and seek the Owner's consent to the proposed replacement.

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: (i) use reasonable efforts to appoint a temporary replacement with equal or better qualifications, expertise and experience to the unavailable Key Individual; and (ii) 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 referred to in Section 5.11 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 Section 63.

5.13 The Design-Builder acknowledges that if any of the Key Individuals are not available and are not replaced as required by this Agreement, the Owner will not obtain the Work 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 the Design-Builder meets its requirements for the Work 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 49.2(b).

5.15 At the Owner's written request, acting reasonably and with such request to be accompanied by the Owner's reason for such request, the Design-Builder will remove and replace any Key Individual, provided that in the event the Design-Builder objects to such request within 10 Business Days of receipt of same, senior management of each of the parties will, at the request of the Design-Builder, meet within a reasonable period after notice of such objection is provided, to discuss the proposed removal and replacement of such Key Individual and reasons for the Design-Builder's objection thereto.

PART C – THE WORK

6. GENERAL

6.1 The Design-Builder will perform the Work in accordance with the requirements of this Agreement, including the 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 shows the critical path of the Work and each major element of the Work, and is consistent with and meets the Target Building Substantial Completion Date, the Target Project Substantial Completion Date and the date required for Total Completion and all other applicable requirements of this Agreement, including the Statement of Requirements.

7.3 The Design-Builder will submit for review by the Owner an updated Time Schedule at intervals of one month, reflecting progress to date and including a comparison to the original baseline Time Schedule submitted in accordance with Section 7.1 and to the previously submitted Time Schedule, the reasons for any changes from the original baseline Time Schedule and the previous Time Schedule and a forecast to achieving Substantial Completion of the Building, Substantial Completion of the Project 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 of the Building, Substantial Completion of the Project and Total Completion.

7.5 The Design-Builder will, within 60 days after the Effective Date, and thereafter every week until Total Completion, deliver to the Owner:

(a) a detailed three week look-ahead schedule based on the then current Time Schedule, updated as required under Section 7.3. Each look-ahead schedule will show:

(i) the planned submission date of all Submittals during the next-occurring three week period;

(ii) all aspects of the Work for the next-occurring three week period, including all planned Design and Construction (including all inspection, testing and other Commissioning) activities;

(iii) a narrative description of the status of all significant Design and Construction (including Commissioning) activities planned for the next-occurring three week period; and

(iv) the Design-Builder's actual progress of the Work during the preceding week, together with a comparison to the previous look-ahead schedule and to the then current Time Schedule;

(b) where any critical path activity is behind schedule, a description of the actions taken, or to be taken, by the Design-Builder to respond.

For clarity, the look ahead schedules and other information provided pursuant to this Section 7.5 will not be considered, and may not be relied upon by the Design-Builder as, notice of any event or circumstance for which a specific notice is required pursuant to this Agreement.

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 and for coordinating the Work with work of Subcontractors and, in accordance with Section 22.2, with work of the Owner and Other Contractors,

in accordance with Good Industry Practice, including 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, 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, the Project Management Plan, Quality Management Plan, Work Plan, Site Plan and the Time Schedule.

8.5 The Design-Builder will employ the Design-Build 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 Work in compliance with this Agreement.

8.7 The Design-Builder will at all times maintain good order and discipline among all Design-Builder Persons 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 60 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 not perform any Construction on the Site prior to the Site Occupation Date and will not commence any Construction until:

(a) the Design-Builder has submitted the Design for the portion of the Work to be constructed, that is in conformance with this Agreement, including the Statement of Requirements, to the Owner under the Review Procedure; and

(b) the Design-Builder is entitled to proceed with the applicable Work under the Review Procedure.

8.10 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.

8.11 The Design-Builder will comply with the provisions of Schedule 9 – 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) describe the integration of the roles and responsibilities of the Design-Builder and the design team, including the Design-Builder's Consultant, Design Build Design Manager, Lead Architect, Mechanical Design Engineer Lead and Electrical Design Engineer Lead and Building Performance Professional, during the Design and Construction (including Commissioning);

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

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

(e) 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;

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

(g) 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 Authority Having Jurisdiction 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, the Payment Certifier 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 or Standards, 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 Authorities Having Jurisdiction.

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 the

reasonable costs incurred by the Design-Builder as a direct 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, defective or deficient in any way, the Design-Builder will immediately complete that part of the Work or correct the defect or deficiency 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, defective or deficient 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, defective or deficient, the Design-Builder will bear the costs and expenses of the Owner, the Owner's Consultant, the Payment Certifier and other representatives.

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 Authorities Having Jurisdiction.

10. NOT USED

11. ENERGY

11.1 The parties will comply with the provisions of Schedule 8 – Energy.

11.2 In addition to the requirements of Section 12, the Design-Builder acknowledges that either, or both, of FortisBC and BC Hydro will provide to the Owner a rebate or other Project Credits in respect of energy modelling of the Building, and the Design-Builder will assist the Owner in obtaining such rebate and any other Project Credits, including:

(a) registering the Building with all applicable and available FortisBC and BC Hydro programs, and any other programs, as applicable;

(b) engaging a consultant(s) acceptable to FortisBC and BC Hydro, as applicable;

(c) submitting the Design and conducting any baseline assessments, if necessary;

(d) conducting all energy modelling that may be required by FortisBC, BC Hydro or the Owner;

(e) engaging with FortisBC and BC Hydro during the development of the Design to understand FortisBC and BC Hydro's described energy assessment(s), energy modelling and reporting;

(f) completing the Work in accordance with the FortisBC and BC Hydro's described energy assessment(s), energy model(s) and reporting requirements;

(g) facilitating any FortisBC and BC Hydro inspections or reviews of the Construction and construction materials; and

(h) any other steps necessary to obtaining FortisBC and BC Hydro rebates and other Project Credits.

11.3 As a condition of Substantial Completion of the Building, the Design-Builder will deliver to the Owner:

(a) FortisBC and BC Hydro compliant energy assessment(s), energy model(s) and energy report(s) with a written confirmation that:

(i) the Project has been designed and constructed to maximize available FortisBC and BC Hydro rebates and other Project Credits; and

(ii) all steps have been performed, including providing all required documentation and information to the Owner, FortisBC and BC Hydro, to obtain FortisBC and BC Hydro rebates and other Project Credits (other than those steps that may only be performed by the Owner).

The Owner acknowledges that FortisBC and BC Hydro rebates and other Project Credits may be received after Substantial Completion of the Project.

11.4 This Section 11 will not limit any requirements of the Statement of Requirements for energy modelling for any purpose.

12. PROJECT CREDITS

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

12.2 The Design-Builder will, on behalf of the Owner, apply to BC Hydro, FortisBC 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).

12.3 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).

13. PRE-CONSTRUCTION SURVEY

13.1 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 of the Project 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.

13.2 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 13.2 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.

14. EQUIPMENT AND FURNISHINGS

14.1 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 the Design under this Agreement.

15. REVIEW PROCEDURE

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

15.2 The Owner and the Design-Builder acknowledge the value to the success of the Project of the Owner being able to provide and the Design-Builder being able to receive early, informal, input, comments, suggestions and other feedback with respect to the Work and the Submittals. As such, the Owner and the Design-Builder acting reasonably agree that:

(a) the Design-Builder may from time-to-time: (i) provide draft versions of Submittals to the Owner for consideration on an informal basis; and (ii) seek input, comments, suggestions or other feedback from the Owner with respect to draft Submittals and other aspects of the Work, provided that the Design-Builder will only be bound by Submittals that have been formally submitted in accordance with the Review Procedure, and not by any statements made or information provided by the Design-Builder during the informal feedback process;

(b) the Owner may provide input, comments, suggestions and other feedback to the Design-Builder with respect to any draft Submittals provided by the Design-Builder or any other aspects of the Work;

(c) the Owner's consideration of a draft Submittal pursuant to this Section 15.2 will: (i) be informal; (ii) only be used to inform the Owner of the development of the formal Submittal and to provide an opportunity for dialogue before the applicable Submittal is complete; (iii) not be subject to the Review Procedure; and (iv) be in addition to, and will not replace,

the requirement to comply with the Review Procedure, including the user consultation protocol under the Review Procedure; and

(d) the Owner may provide input, comments, suggestions or other feedback orally or in writing and, upon request by the Owner's Representative, the Design-Builder will organize and attend review meetings to discuss the Owner's input, comments, suggestions or other feedback.

Notwithstanding any other provision of this Agreement, under no circumstances will any input, comments, suggestions or other feedback provided by the Owner, or the failure or refusal of the Owner to provide any input, comments, suggestions or other feedback, pursuant to this Section 15.2:

(e) constitute a Change or otherwise entitle the Design-Builder to make any claim for an adjustment in the Contract Time or Contract Price, or for any remuneration, compensation or damages whatsoever;

(f) relieve or exempt the Design-Builder or any Design-Builder Person from any of its or their obligations and liabilities under this Agreement, at law or in equity;

(g) constitute a waiver or release by the Owner of any duty or liability owed by the Design-Builder or any other person to the Owner, or of any indemnity given by the Design-Builder to the Owner under this Agreement;

(h) create or impose any requirement, liability, covenant, agreement or obligation on the Owner; or

(i) limit the Owner's right to identify defects or deficiencies relating to any Submittal or its implementation.

16. GENERAL DESIGN REQUIREMENTS

16.1 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.

16.2 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 Standards; 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.

16.3 The Design-Builder will:

(a) cause all portions and aspects of the Design Submittals 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 Design Submittals, including the Drawings and Specifications, implement and otherwise conform to this Agreement, including the Statement of Requirements;

(ii) the Design Submittals, including the Drawings and Specifications, implement and otherwise conform to the Proposal Extracts;

(iii) the Design Submittals, including 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 this Agreement (including the Statement of Requirements), the Design Submittals, and all applicable Laws and Standards; and

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

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

16.5 The Design-Builder may, at any time, request that the Owner accept an Equivalent by submitting details of the proposed Equivalent, together with such supporting documentation and information as the Owner may require, under the Review Procedure. Acceptance of an Equivalent may in the discretion of the Owner be withheld or may be granted subject to such conditions as the Owner, in its discretion, considers appropriate.

16.6 The Design-Builder will make, or cause the Design-Builder's Consultant to make, any revisions to the Design Submittals as are necessary from time to time due to Changes and, for clarity, the Design-Builder will comply with Section 16.3 with respect to any such revisions.

16.7 Nothing in this Section 16, 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 Design Submittals with the Statement of Requirements and all other requirements of this Agreement, including all applicable Laws and Standards, and the Design-Builder will, notwithstanding any review or acceptance under the Review Procedure or this Section 16 or other act of the Owner, the Owner's Representative, the Owner's Consultant, the Payment Certifier or any other person on behalf of the Owner, remain solely liable and responsible for compliance of the Design Submittals with the Statement of Requirements and all other requirements of this Agreement, including all applicable Laws and Standards.

16.8 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 and all other requirements of this Agreement, including all applicable Laws and Standards;

(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, the Design Submittals, all Standards and all terms of this Agreement;

(f) liaising with the Owner and the Authorities Having Jurisdiction as required during the Design and Construction and providing copies of all correspondence with such Authorities Having Jurisdiction to the Owner; and

(g) providing all required assurances to the 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, licences or approvals.

16.9 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.

16.10 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.

17. DESIGN PROCESS

17.1 The Design-Builder will undertake the Design:

(a) in accordance with the user consultation protocol described in the Review Procedure, including providing Design Submittals to the Owner in accordance with the Submittal Schedule and undertaking consultation with the User Consultation Group; and

(b) in progressive stages, with each stage capturing the information and detail of the previous stage.

17.2 Unless otherwise agreed by the Owner, the Design-Builder will submit all Design Submittals, including Drawings, Specifications, the Energy Model, calculations and supporting information to the Owner in logically organized Design packages, for review under the Review Procedure in accordance with the Statement of Requirements at the following Design stages:

(a) 30%;

(b) 60%;

(c) 95%; and

(d) 100%.

17.3 Within 30 days after the Effective Date, the Design-Builder will submit to the Owner for review under the Review Procedure, the 30% Design Submittals, including Drawings, Specifications and the Energy Model, for the Project.

17.4 After review of the Design Submittals at the 100% Drawings and Specifications stage by the Owner, the Design-Builder will finalize and complete the "issued for construction" Drawings and Specifications. Promptly after the Design Submittals at the 100% Drawings and Specifications stage have received the notation "REVIEWED" under the Review Procedure, the Design-Builder will provide one copy 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 the Statement of Requirements and all other requirements of this Agreement, including all applicable Laws and Standards, and Submittals from the 100% Drawings and Specifications stage (including to address comments received from the Owner). The Design-Builder will provide the Drawings and Specifications on a flashdrive, unless directed to use a different format by the Owner, acting reasonably, in AutoCAD DWG and Adobe PDF format acceptable to the Owner, acting reasonably.

17.5 Without limiting the generality of Section 17.1, each of the Submittals in this Section 17 must be formatted in a manner 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;

(f) Energy Model;

(g) electrical design; and

(h) geoexchange.

17.6 Each of the Design Submittals in this Section 17 must be submitted electronically on a flashdrive, unless directed to use a different format by the Owner, acting reasonably, and contain:

(a) Drawings at full scale;

(b) Specifications;

(c) supporting material (such as: code analysis, energy model report, 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 30% stage, exterior perspectives;

(g) at 30% and 95% stage for mechanical Design Submittals, written confirmation from the Independent Commissioning Agent that all components necessary for successful Commissioning are included;

(h) at 60% stage, interior perspectives;

(i) at 60% stage, all development and building permit drawings and design;

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

(k) a certificate from the Design-Builder's Consultant that the applicable Design Submittals conform to the requirements of the Statement of Requirements and all other requirements of this Agreement;

(l) equipment selections;

(m) such other information as may be required to demonstrate that the Submittals and the applicable Work conform to the Statement of Requirements and all other requirements of this Agreement; and

(n) any other information that the Owner may reasonably request.

17.7 The Design-Builder will comply with any requirements set out in the Statement of Requirements in relation to the stages and process for Design, including with respect to meetings, presentations, models, mock-ups, renderings and user groups.

17.8 Unless otherwise required by the Owner, the Design-Builder will provide, use, maintain, 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.

18. OWNERSHIP OF DOCUMENTS AND INTELLECTUAL PROPERTY

18.1 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 from the Owner for any other use.

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

18.3 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.

18.4 Submission or distribution of the Design-Builder's Consultants' or other consultants' Design, plans, sketches, Drawings, graphic representations, Specifications and other Design Submittals 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, nor an infringement of the Design-Builder's Consultants' or other consultants' rights in such Design, plans, sketches, Drawings, graphic representations, Specifications and other Design Submittals.

18.5 The Owner may retain copies, including reproducible copies, of all plans, sketches, Drawings, graphic representations, Specifications and other material including the Record Drawings and the Design. Without limiting Section 18.7(b), the Design-Builder hereby grants to the Owner a non-exclusive, royalty-free, fully paid up, perpetual and irrevocable licence to Use the Design, plans, sketches, Drawings, graphic representations, Specifications and other material including the Record Drawings, and any and all such material for any purpose related to the ownership, operation, repair, maintenance and use 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 or 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 or any other applicable consultants confirming such licence.

18.6 Models, mock-ups and renderings furnished by the Design-Builder are the property of the Owner. The Design-Builder will, and will require all Subcontractors to, transfer and assign to the Owner all right, title and interest, including rights relating to Intellectual Property, in and to such models, mock-ups and renderings, and to provide to the Owner waivers of all non-assignable rights therein, in such forms as may reasonably be requested by the Owner.

18.7 Project Intellectual Property Licence:

(a) The Design-Builder will not, and will require that any Subcontractor not, incorporate, embed or otherwise include in the Facility or Design, or construct or Commission the Facility to require the Use of, any Intellectual Property that is not either:

(i) Intellectual Property owned by or licensed to the Owner and which the Owner has provided to the Design-Builder for use by the Design-Builder and its Subcontractors in the performance of the Work; or

(ii) Project Intellectual Property licensed to the Owner pursuant to Section 18.5, 18.7(b) or 18.8.

(b) Subject to Section 18.8, but without limiting Section 18.5, the Design-Builder hereby irrevocably and unconditionally grants and agrees to grant to the Owner, and will cause all Subcontractors to irrevocably and unconditionally grant to the Owner, a non-exclusive, royalty-free, fully paid up, perpetual and irrevocable licence, during and after the Term, to Use all Project Intellectual Property, including:

(i) for any design, construction, completion, commissioning, testing, operation, maintenance, repair, renovation, modification, alteration, adaptation, rehabilitation, improvement, expansion, extension, financing or regulation of the Facility;

(ii) for any connection or interconnection of the Facility with any other facility or system owned or operated by or for the benefit of the Owner;

(iii) for reference purposes in connection with other operations, projects and facilities of the Owner; and

(iv) with respect to the contemplation, procurement or undertaking of any of the foregoing activities by the Owner or any third parties acting on behalf of or for the benefit of the Owner.

To the extent applicable to any Project Intellectual Property to which this Section 18.7(b) applies, the PIP General Licence granted by this Section 18.7(b) is on an enterprise basis (without any restriction or limitation as to the number or identity of locations, sites, systems, installations, environments, copies, users, platforms, interfacing software, equipment, hardware or otherwise).

(c) The Design-Builder will do such acts and will execute and deliver, or cause to be done, executed and delivered, any and all further actions or documents as may be reasonably required to give full effect to the PIP General Licence. Without limiting the generality of the foregoing, the Design-Builder will be responsible to ensure that all Subcontractors of every tier are required by Subcontract to do such acts and execute and deliver any and all further documents as may be reasonably required to give full effect to the PIP General Licence, including by enforcing the foregoing obligation against any Subcontractor of a lower tier pursuant to the applicable Subcontract for the benefit of the Owner.

(d) If any software or computer code is licensed to the Owner as Project Intellectual Property pursuant to Section 18.7(b):

(i) the Design-Builder will, at the end of the Term or at any other time upon the Owner's request, deliver to the Owner the object code version and Source Code Materials for that software or computer code, both of which shall constitute Project Intellectual Property; and

(ii) the Design-Builder will not include in the software or code, and will require that any Subcontractor not include in the software or code, any Lock, and upon notice by the Owner that any software or code included in the Project Intellectual Property contains a Lock, the Design-Builder will, or will cause the applicable Subcontractor to, promptly remove the Lock or procure and provide a Lock-free version of the software or code.

(e) If the Owner is granted a licence pursuant to Section 18.7(b) in respect of any Project Intellectual Property that is not delivered to the Owner as part of the Work or the Facility, the Design-Builder will, or will cause the applicable Subcontractor to, physically supply and deliver that Project Intellectual Property to the Owner at any time upon the Owner's request.

(f) The PIP General Licence is and will remain perpetual and irrevocable and will survive indefinitely after the expiration or termination of this Agreement or any other agreement between the Design-Builder and the Owner. The Design-Builder will not terminate, revoke

or rescind all or any part of the PIP General Licence for any reason or cause whatsoever; and if the Owner or any other person commits any breach (whether fundamental or not) of this Agreement, and whether the breach is or is not capable of being cured, the Design-Builder's sole rights and remedies in respect of the breach are limited to the Design-Builder's rights and remedies other than termination, revocation or rescission of all or any part of the PIP General Licence. For greater certainty, nothing in this Agreement restricts or limits the Design-Builder's remedy of damages for breach of this Agreement. No breach of this Agreement, including any Use of Project Intellectual Property beyond the scope of the rights granted under this Section 18, by the Owner or any other person will constitute a repudiation of this Agreement or the PIP General Licence by the Owner.

18.8 Separately Licensed Intellectual Property: COTS Software Products and other Intellectual Property made commercially available by the licensor thereof (together, "**Separately Licensed IP**") may be provided by the Design-Builder or a Subcontractor as part of the Work pursuant to licence terms other than the PIP General Licence, subject to the following terms and conditions:

(a) prior to the Design-Builder or any Subcontractor providing any Separately Licensed IP as part of the Work on license terms other than the PIP General Licence, the Design-Builder will give notice to the Owner describing the Separately Licensed IP, the purpose for which the Separately Licensed IP is to be used and the reasons for selecting the Separately Licensed IP for performance of the Work (as compared to other Intellectual Property that could be provided pursuant to the PIP General Licence and other Separately Licensed IP generally, if such comparisons are applicable), and providing copies of the licence agreement applicable to the Separately Licensed IP (the "***SLIP Licence***") and, for any Separately Licensed IP that is software, copies of any Ancillary Software Service Agreements applicable thereto;

(b) within ten Business Days after receipt of a notice from the Design-Builder pursuant to Section 18.8(a), the Owner will give notice to the Design-Builder either:

(i) approving the Separately Licensed IP and the SLIP Licence, and if applicable any associated Ancillary Software Service Agreements, in which case the Design-Builder or the applicable Subcontractor may provide the Separately Licensed IP as part of the Work on the terms and conditions of the SLIP Licence, and if applicable any associated Ancillary Software Service Agreements;

(ii) rejecting the Separately Licensed IP and the SLIP Licence, in which case, without limiting the Design-Builder's obligation to perform the Work, the Design-Builder or the applicable Subcontractor will not provide the Separately Licensed IP as part of the Work; or

(iii) approve the Separately Licensed IP, subject to amendment of the SLIP Licence, and if applicable any associated Ancillary Software Service Agreements, to include terms and conditions required by the Owner, in which case the Design-Builder or the applicable Subcontractor may provide the Separately Licensed IP as part of the Work only if the SLIP Licence, and if applicable any associated Ancillary Software Service Agreements, is amended in accordance with the Owner's requirements or on other terms and conditions acceptable to the Owner;

(c) without limiting Section 18.8(b), with respect to any Separately Licensed IP that is software, the Owner may require as a condition of its approval that the Source Code Materials for that Separately Licensed IP be placed in escrow pursuant to a source code escrow agreement on terms and conditions acceptable to the Owner;

(d) any SLIP Licence, and if applicable any Ancillary Software Service Agreement, approved by the Owner will, as directed by the Owner, either be:

(i) entered into between the Owner and the licensor of the Separately Licensed IP or provider of services under the Ancillary Software Service Agreement, in which case the Design-Builder shall ensure that it has obtained by separate agreement or through the SLIP Licence or Ancillary Software Service Agreement all rights and licences required by the Design-Builder and the Subcontractors to perform the Work and discharge all of their obligations under this Agreement; or

(ii) entered into between the Design-Builder and the licensor of the Separately Licensed IP or provider of services under the Ancillary Software Service Agreement, in which case the Design-Builder shall ensure that the SLIP Licence and Ancillary Software Service Agreements are assignable by the Design-Builder to the Owner without:

(A) any further consent of the other party thereto;

(B) any modification to the terms thereof;

(C) giving rise to any right of termination; and

(D) payment of any fees, charges or other amounts;

and the Design-Builder will assign the SLIP Licence to the Owner on demand;

(e) upon request by the Owner, the Design-Builder will promptly deliver to the Owner a full and complete copy of each SLIP Licence, and each related Ancillary Software Service Agreement;

(f) the Design-Builder will use commercially reasonable efforts to enforce for the benefit of the Owner, and to assist the Owner to enforce, each SLIP Licence, and each related Ancillary Software Service Agreement.

18.9 Improper Licensing / Infringement Allegation: In addition to the Design-Builder's obligations under Section 58, if the Design-Builder is in breach of Section 18.7(a)(ii) in respect of any Project Intellectual Property, or if an item of Project Intellectual Property is, or if the Design-Builder or the Owner reasonably believe that an item of Project Intellectual Property is reasonably likely to become, the subject of an Infringement Allegation against the Design-Builder, the Owner or any other person, or if the creation, possession, provision or Use of an item of Project Intellectual Property in accordance with this Agreement is enjoined by order of a court or tribunal of proper jurisdiction and authority, then the Design-Builder will at its own expense either:

(a) promptly obtain for the Design-Builder and the Owner and its successors and assigns the right to Use and continue Using the impugned Project Intellectual Property in accordance with this Agreement, and without risk of the Infringement Allegation, if applicable; or

(b) promptly replace or modify the improperly licensed or impugned Project Intellectual Property (including by entering into new SLIP Licences in accordance with the requirements of Section 18.8) so that it is, as applicable, licensed in accordance with Sections 18.5, 18.7 or 18.8 and no longer subject to the Infringement Allegation, in each case without any loss of functionality, operation, performance, results or benefit of the improperly licensed or impugned Project Intellectual Property or any other Project

Intellectual Property, in which case the Design-Builder and the Owner will use the replacement or modified Project Intellectual Property and will cease using the improperly licensed or impugned Project Intellectual Property.

Notwithstanding any other provision of this Agreement and for greater certainty, the replacement of improperly licensed or impugned Project Intellectual Property with replacement or modified Project Intellectual Property pursuant to Section 18.9(b) will not be a breach of any provision of this Agreement that requires the licence for such Project Intellectual Property to be perpetual and irrevocable.

18.10 Non-Assertion: The Design-Builder agrees not to assert, and to require its Subcontractors not to assert, any Intellectual Property rights or claims against the Owner or any of its successors, assigns or licensees that would have the effect of diminishing the rights granted to the Owner or any of its successors, assigns or licensees under this Agreement.

18.11 Conflicting Licences: All Project Intellectual Property will be licensed in accordance with this Section 18 only, and except as provided in Section 18.8, the Design-Builder must ensure that any form of licence agreement or other terms and conditions used or provided by a licensor in association with any Project Intellectual Property will be of no force or effect and will not be binding on the Owner or any of its successors, assigns or licensees, even if by its terms the licence agreement or other terms and conditions are stated to be accepted by the installation or use of the subject Project Intellectual Property, and regardless of any acceptance of the licence agreement or other terms and conditions that is required in order to install or use the subject Project Intellectual Property.

19. ERRORS IN DESIGN

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

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

19.3 The Design-Builder will remedy at its own cost any error, omission, defect or deficiency identified in the Design, including any resulting error, omission, defect 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.

20. LABOUR AND PRODUCTS

20.1 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.

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

21. SUBCONTRACTS

21.1 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.

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

21.3 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.

21.4 Nothing contained in this Agreement will create any contractual relationship between the Owner and any Design-Builder Persons.

21.5 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.

21.6 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.

22. OTHER CONTRACTORS

22.1 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.

22.2 The Design-Builder will:

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

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

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

22.4 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 47.

22.5 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 that are applicable to health and construction safety at the Site and that are in accordance with the *Workers Compensation Act* (British Columbia).

22.6 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.

22.7 The Owner will assure, where possible, that Other Contractors are bound to equivalent terms as those found in this Section 22.

22.8 Claims, disputes, and other matters in question between the Design-Builder and Other Contractors will be dealt with as provided in Section 63 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 63.

23. ACCESS TO AND USE OF SITE

23.1 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 of the Project, to perform the Work that is required to be performed on the Site.

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

23.3 After Substantial Completion of the Building, the Design-Builder will:

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

(b) comply with the Owner's requirements as set out in Section 32 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 defects and deficiencies including warranty defects and deficiencies; and

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

23.4 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.

23.5 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 the Site Occupation Date and recorded in the pre-condition survey as described in Section 13.1.

23.6 The Design-Builder acknowledges and agrees that the Design-Builder, the Subcontractors and their respective workers will not park on public streets within a 1km radius of the Site. The Design-Builder will use reasonable efforts to provide temporary parking or other alternate transportation solutions for workers.

24. PHASED CONSTRUCTION

24.1 The Design-Builder will carry out the Construction in accordance with the Project Management Plan. The Project Management Plan will be prepared in accordance with Good Industry Practice, meet all applicable requirements of this Agreement, including the Statement of Requirements, and describe, among other things:

(a) the Design-Builder's plan to ensure coordination with Authorities Having Jurisdiction and utility companies;

(b) all Site preparation, including laydown areas and overall Site organization and usage, including compliance with the requirements for continuous use and access of the Existing Gymnasium and Existing Gymnasium Parking;

(c) the Construction of the Facility, including construction constraints, risks and mitigation strategies and compliance with all requirements and timing for construction and Commissioning (including all systems, sub-systems and equipment);

(d) the sequencing of the Construction of the Building and the other parts of the Facility and the Project, including connections to the Existing Gymnasium;

(e) Site landscaping;

(f) parking, access, egress and traffic flows, including the plant to maintain adequate vehicle, delivery, emergency and pedestrian access to the Site, including the Existing Gymnasium and the Existing Gymnasium Parking;

(g) the permanent integration and connection of the School with the Existing Gymnasium;

(h) the roles, responsibilities and lines of report between the Key Individuals and other key resources involved in the Design and Construction; and

(i) the processes and procedures by which the Design-Builder will ensure that the Owner's goals and objectives for the Project are achieved; and

and the Design-Builder will submit the Project Management Plan to the Owner within 30 days after the Effective Date and will not proceed with any Work on the Site until the Project Management Plan has received the notation "REVIEWED" under the 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 implementation of the revised Project Management Plan until it has received the notation "REVIEWED" under the Review Procedure.

24.2 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) ensure that any video surveillance on, or of, the Site complies with all applicable Laws and SD23 Board Policy "645 - Video Surveillance Closed Circuit Television", a copy of which is contained in the Disclosed Data;

(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, emergency or pedestrian access, except as may be permitted pursuant to the Project Management Plan;

(f) cause the Design-Builder Persons 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) not use any explosives without the Owner's consent;

(h) take reasonable steps to ensure that Design-Builder Persons do not smoke on any portion of the Site other than designated smoking areas;

(i) 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; and

(j) before commencing any Construction on the Site, prepare and implement in cooperation 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.

24.3 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.

25. CONNECTIONS AND INTEGRATION TO THE EXISTING GYMNASIUM

25.1 The Existing Gymnasium must remain fully operational, supported by the Existing Gymnasium Parking, and available for continuous use by the Owner at all times during Construction.

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

(a) cooperate with the Owner to coordinate any work required to:

(i) relocate temporary utility services as required to maintain, and minimize any interference to, the on-going operation of the Existing Gymnasium;

(ii) complete the connection of the permanent utility services and building systems back to the School, including power, gas, water, LAN, phone, fire, security and building automation; and

(iii) relocate the Existing Gymnasium Parking, as the Construction progresses;

(b) adhere to all Owner policies and procedures relating to the Existing Gymnasium and the Existing Gymnasium Parking established from time to time;

(c) provide, on a continuous basis, at least 16 parking stalls for exclusive use by the Owner and any Existing Gymnasium users, at a location on the Site and located in such a way that the furthest parking stall is not more than 65 metres from the main entrance to the Existing Gymnasium (the "***Existing Gymnasium Parking***");

(d) maintain the Existing Gymnasium Parking in accordance with Good Industry Practice, including providing safe access and egress to the Existing Gymnasium Parking and between the Existing Gymnasium Parking and the Existing Gymnasium, provided however that the Owner will be responsible for snow and ice removal on, and from, the Existing Gymnasium Parking and the Existing Gymnasium;

(e) provide and maintain temporary lighting of the Existing Gymnasium Parking, to the applicable exterior illumination standards set out in the Statement of Requirements;

(f) provide and maintain emergency access to the Existing Gymnasium and the Existing Gymnasium Parking in accordance with all applicable Laws and Standards; and

(g) prior to performing any Work in or around the Site that is not indicated in the Site Plan or Project Management Plan or proceeding with any proposed disruption of access to the Existing Gymnasium or the Existing Gymnasium Parking, or shutdown of Existing Gymnasium services or relocation of the Existing Gymnasium Parking, deliver to the Owner and obtain the Owner's approval of a work plan (the "***Work Plan***") clearly identifying:

(i) the activity that may interfere with the operation of the Existing Gymnasium or the Existing Gymnasium Parking, 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 or a particular shutdown.

25.3 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 Existing Gymnasium and the Existing Gymnasium Parking. The Design-Builder will not proceed with disruption of access to the Existing Gymnasium or the Existing Gymnasium Parking, any work in the Existing Gymnasium, any proposed shutdown of Existing Gymnasium services or any relocation of the Existing Gymnasium Parking without:

(a) the Owner's prior written approval of a Work Plan under this Section 25, 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.

26. SIGNAGE

26.1 The Design-Builder may erect signage at the Site during Construction to identify the Design-Builder, provided such signage, the duration of display and its location(s) is acceptable to the Owner, acting reasonably. The Design-Builder will not erect any other signage at the Site during Construction without the prior written consent of the Owner, which may be withheld or granted subject to such conditions as the Owner, in its discretion, considers appropriate.

26.2 The Design-Builder will also erect the Owner's signage as required by the Owner.

27. USE OF SITE

27.1 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.

27.2 The Design-Builder will comply, and will cause all Design-Builder Persons to comply, with the Owner's policies, procedures and instructions, including the Code of Conduct and any policies related to parking, safety, harassment, fires, smoking, signs and advertisements.

27.3 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.

27.4 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, including access to and operation of the Existing Gymnasium.

27.5 The Design-Builder will confirm the location of all utilities, including any underground 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 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.

28. CONDITIONS AT SITE/DISCLOSED DATA

28.1 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 the objective geotechnical data and the objective traffic count 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 for, and subject to Section 28.1(c), the accuracy of the objective geotechnical data and the objective traffic count data) 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 28, 29 and 30, 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.

28.2 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 to the extent permitted by Section 28.1(c) with respect to the accuracy of the objective geotechnical data and the objective traffic count data, 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.

28.3 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 28.2 if it has failed to obtain sufficient geotechnical information necessary to prepare a Design that reasonably anticipates the soils conditions actually encountered.

28.4 If the Design-Builder is delayed in performing the Work as a result of an inaccuracy, upon which it is entitled to rely pursuant to Section 28.1(c), in the objective geotechnical data or the objective traffic count 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 51. If the Design-Builder is not delayed in performing the Work but incurs additional costs as a result of an inaccuracy, upon which it is entitled to rely pursuant to Section 28.1(c), in the objective geotechnical data or the objective traffic count data provided in the Site Reports, adjustment to the Contract Price will be agreed upon or determined in accordance with Section 48.

29. ARCHAEOLOGICAL ITEMS

29.1 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 Authorities Having Jurisdiction with respect to such discovery including pursuant to the *Heritage Conservation Act* (British Columbia).

29.2 If the Design-Builder is delayed in performing the Work as a result of taking steps required under Section 29.1, the Design-Builder's entitlement to an extension of the Contract Time and reimbursement of costs will be determined in accordance with Section 51. If the Design-Builder is not delayed in performing the Work but incurs additional costs as a result of taking steps required under Section 29.1, adjustment to the Contract Price will be agreed upon or determined in accordance with Section 48.

30. CONTAMINANTS AND ENVIRONMENTAL MANAGEMENT

30.1 Design-Builder shall not use or permit to be used on or brought onto the Site or any part thereof for the sale, storage, manufacture, disposal, handling, treatment, generation, use, transport, refinement, processing, production, remediation or release of, or any other dealing with, any Contaminants without the prior approval of the Owner. Any approval requested under this Section 30.1 may be granted or withheld in the Owner's discretion.

30.2 The Design-Builder acknowledges and agrees:

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

(i) Phase 1 Environmental Site Assessment dated May 2023

(the "***Environmental Report***");

(b) it has had the opportunity to undertake examinations and investigations of the Site, including existing structures 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 Report; and

(d) none of the Owner, the Owner's Representative, the Owner's Consultant or any other person on behalf of the Owner is in any way responsible or liable for the completeness, interpretation or accuracy of the Environmental Report.

30.3 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 Authorities Having Jurisdiction and to the Owner.

30.4 Except to the extent that the Design-Builder or any Design-Builder Person has directly or indirectly aggravated, exacerbated, migrated or otherwise increased the area or cost of dealing with the Contaminants through negligence or breach of this Agreement:

(a) 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 Report, by taking steps required under Section 30.3, the Design-Builder's entitlement to an extension of the Contract Time and reimbursement of costs will be determined in accordance with Section 51; or

(b) 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 Report, adjustment to the Contract Price will be agreed upon or determined in accordance with Section 48.

31. SITE SAFETY

31.1 In accordance with this Section 31, 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". The Design-Builder will be responsible for ensuring that proper delineation of the Site, and appropriate notices of project, occurs such that:

(a) from:

(i) the Site Occupation Date until the Substantial Completion Date for the Project, the Design-Builder is the "prime contractor" for all areas of the Site, excluding the Existing Gymnasium as delineated by its exterior walls; and

(ii) the Substantial Completion of the Project until Total Completion, the Design-Builder is the "prime contractor" for all areas of the Site, excluding the Building and the Existing Gymnasium as delineated by their exterior walls;

(b) at all times when Work is being performed within the Existing Gymnasium, the Design-Builder is responsible to separately delineate the area(s) of the Existing Gymnasium within which Work is being performed and will be the "prime contractor" for such separately delineated work area(s); and

(c) the Owner remains the "prime contractor" for:

(i) the Existing Gymnasium at all times when Work is not being performed within the Existing Gymnasium; and

(ii) the areas of the Existing Gymnasium that are outside of the Design-Builder's separately delineated work area(s), if any, during those times when Work is being performed within the Existing Gymnasium.

31.2 Prior to commencing the Work and as a condition of receiving payment on Substantial Completion of the Building, on Substantial Completion of the Project 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.

31.3 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 31.2.

31.4 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.

31.5 The Design-Builder will establish, implement and provide for the review by the Owner, by no later than 30 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, visitors 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:

(a) provide and maintain access to and between the Existing Gymnasium and the Existing Gymnasium Parking, at all times; and

(b) limit access to all other areas of the Site until Substantial Completion of the Project, provided that the Design-Builder will provide and maintain access to and between the Existing Gymnasium, the Existing Gymnasium Parking and the Building, at all times after Substantial Completion of the Building, while limiting access to all other areas of the Site from Substantial Completion of the Building to Total Completion,

in accordance with the Health and Safety Plan.

31.6 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, visitors and others who may be on the Site or on property in the vicinity of the Site, including those who may be accessing or using:

(a) the Existing Gymnasium;

(b) the Existing Gymnasium Parking; and

(c) the Building, after Substantial Completion of the Project.

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

31.8 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. Notwithstanding the immediately preceding sentence, a person who is accessing the Site solely for the purpose of accessing or using an area of the Existing Gymnasium or Building for which the Design-Builder is not the "prime contractor" will not be required to attend a Design-Builder health and safety orientation.

32. DUST, NOISE AND VIBRATION

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

32.2 Without limiting Section 32.1, the Design-Builder will discuss with the Owner any expected vibration from the Construction activities, will plan operations to minimize disruption to Existing Gymnasium activities, and will carry out its Construction activities, so that dust, noise, vibration, noxious odours and fumes do not unreasonably and adversely affect Existing Gymnasium activities or use of properties in the vicinity of the Site.

33. TESTING AND COMMISSIONING

33.1 The Design-Builder will prepare and deliver to the Owner, not less than 365 days before the Target Building Substantial Completion Date, for review under the Review Procedure, a detailed testing

and commissioning plan (the "***Commissioning Plan***") that is consistent with the requirements for Commissioning of the Facility identified in the Statement of Requirements and that sets out the Commissioning Work the Design-Builder intends to carry out to Commission the Facility. The Commissioning Plan will comply with Good Industry Practice and all applicable Laws and Standards and include, among other things:

(a) the names of all persons to be involved in the Commissioning Work, together with details of the organization and responsibilities of each member of the Design-Builder's Commissioning team;

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

(c) a training plan demonstrating how the Design-Builder will deliver all of the training, as required by the Statement of Requirements, to the Owner's operating and maintenance staff;

(d) detailed procedures for conducting all of the Commissioning Work, including reference documents, manufacturer's recommendations, inspection and test standards and acceptance criteria, and narrative descriptions explaining how each inspection and test parameter will be measured or calculated, and a description of how inspection and test results will be reported;

(e) a description of the specific equipment, systems and sub-systems to be Commissioned and the associated Commissioning requirements, together with details of the specific equipment, systems and sub-systems required to be Commissioned before each of:

(i) Substantial Completion of the Building; and

(ii) Substantial Completion of the Project;

(f) a description of the Commissioning requirements and acceptance criteria for the specific equipment, systems and sub-systems to be Commissioned;

(g) at a minimum, all Commissioning required to:

(i) demonstrate the functionality and proper integration of the Facility, including the:

(A) functionality and integration of the building automation system;

(B) electrical systems;

(C) lighting control system;

(D) LAN;

(E) BMS;

(F) heating, ventilation and air conditioning systems;

(G) exhaust air systems;

(H) heat recovery systems;

(I) geoexchange;

(J) plumbing and sanitary system;

(K) fire protection system;

(L) fire alarm system;

(M) security/intrusion system;

(N) communication system;

(O) audio-visual system;

(P) permanent integration and connection of the School with the Existing Gymnasium;

(Q) accessible facilities; and

(R) furniture, fixtures and equipment;

(ii) demonstrate that any Owner supplied equipment installed by the Design-Builder has been properly installed in accordance with the Project requirements;

(iii) provide quantitative data with respect to the Facility and each piece of equipment, component, system and sub-system for use as a baseline in comparing performance, determining deterioration over the applicable Design Life and assessing the sufficiency and performance of the Facility;

(iv) demonstrate how the Independent Commissioning Agent will fulfill the roles and responsibilities described in Section 33.3(b), 33.3(c), 33.3(d), 33.3(e) and 33.3(f); and

(v) demonstrate that the primary plant systems (including the boilers, chillers and pumps) operate in a stable fashion under part load without hunting or short cycling.

(h) a schedule, related to the Time Schedule, showing the timing of all Commissioning Work; and

(i) supporting documentation, including as appropriate:

(i) design calculations and/or assumptions; and

(ii) manufacturer's specifications and technical documentation.

33.2 The Design-Builder will implement, and ensure that all Design-Builder Persons engaged in the Commissioning Work comply with, the "REVIEWED" Commissioning Plan. Without limiting the other requirements of this Section 33, as part of the Commissioning Work, and prior to making an application for:

(a) the Substantial Completion Certificate for the Building, the Design-Builder will successfully complete all Commissioning Work required for Substantial Completion of the Building; and

(b) the Substantial Completion Certificate for the Project, the Design-Builder will successfully complete all Commissioning Work.

For the purpose of this Section 33 and Section 44, "successful completion" of a Commissioning step, inspection or test will mean that the step, inspection or test has demonstrated that the Facility, or the applicable portion thereof, complies with all applicable requirements of this Agreement, including the Statement of Requirements, and all Standards and has been approved in writing by the Independent Commissioning Agent.

33.3 Not less than 60 days after the Effective Date, the Design-Builder will retain a qualified independent commissioning agent, acceptable to the Owner, acting reasonably (the "***Independent Commissioning Agent***"), to:

(a) review and approve the Commissioning Plan prior to submission to the Owner in accordance with Section 33.1;

(b) provide oversight of the Commissioning of all equipment, systems, sub-systems and the Facility to demonstrate to the Owner: (i) that the equipment, systems, sub-systems, including all mechanical, geo-exchange and other major systems, and the Facility are fully operational and compliant with all applicable requirements of this Agreement, including the Statement of Requirements, and all Standards; and (ii) that the Owner may occupy the Facility for its intended use as described in the Statement of Requirements;

(c) review and approve all mechanical Design Submittals, at the 30% and 95% design stage, prior to submission to the Owner in accordance with Section 17;

(d) attend at Site throughout the Construction, as required to ensure that all equipment, products, components, systems and sub-systems, including all valves, dampers, sensors and control components, necessary for successful Commissioning have been correctly installed;

(e) verify all inspection, testing, adjustment, balancing, start-up activities, and other Commissioning Work to ensure that they have been successfully completed; and

(f) review and approve all inspection and test procedures, inspection and test results and the Commissioning Test Report prior to submission to the Owner in accordance with the Review Procedure.

The Independent Commissioning Agent will prepare a written report to confirm the successful completion of: (i) all Commissioning Work required for Substantial Completion of the Building, as a condition precedent to Substantial Completion of the Building; and (ii) all Commissioning Work, including all Commissioning Work required for Substantial Completion of the Project, as a condition precedent to Substantial Completion of the Project.

Commissioning will include, among other things, the following:

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

(h) end to end Commissioning of key equipment, systems and sub-systems, including the:

(i) electrical systems;

(ii) lighting control system;

(iii) LAN;

(iv) BMS;

(v) heating, ventilation and air conditioning systems;

(vi) exhaust air systems;

(vii) heat recovery systems;

(viii) geoexchange;

(ix) plumbing and sanitary system;

(x) fire protection system;

(xi) fire alarm system;

(xii) security/intrusion system;

(xiii) communication system;

(xiv) audio-visual system;

(xv) permanent integration and connection of the School with the Existing Gymnasium;

(xvi) accessible facilities; and

(xvii) furniture, fixtures and equipment; and

(i) validation of the proper functioning of all equipment, systems and sub-systems and all points of integration between such equipment, systems and sub-systems.

Upon appointment by the Design-Builder in accordance with this Section 33.3, the Independent Commissioning Agent will be a Key Individual.

33.4 Within 30 days after Substantial Completion of the Building, the Design-Builder will prepare and submit a commissioning test report to the Owner, for review in accordance with the Review Procedure (the "**Commissioning Test Report**"). The Commissioning Test Report will be prepared in consultation with, and approved by, the Independent Commissioning Agent, and will include:

(a) a description of all Commissioning Work performed by the Design-Builder, together with detailed records of all results, data and observations obtained during the Commissioning of the Facility;

(b) information for each tested piece of equipment, system and sub-system, including:

(i) a description of the tested equipment, system or sub-system;

(ii) a description of the purpose of the test, including pass/fail criteria;

(iii) details of the test procedure utilized and any applicable industry standards;

(iv) the time and date of the test and name of tester;

(v) details of the measuring instruments used, including make, model and accuracy; sketches indicating location of test measurements; calibration data for each instrument; and calculation of measurement uncertainty;

(vi) sample calculations demonstrating how test results were obtained from measured data;

(vii) photographs and other test documentation; and

(viii) the results of the test, including pass or fail;

(c) all signed off quality control inspection sheets with final calibrations, set points, measurements and inspection results; and

(d) a baseline report covering each tested piece of equipment, system and sub-system, including all quantitative data required to establish a baseline for comparing performance, determining deterioration over the applicable Design Life and assessing the sufficiency and performance of the Facility.

Within seven days after each of: (i) Substantial Completion of the Project; and (ii) the Total Completion Date, the Design-Builder will prepare and submit an updated Commissioning Test Report, including details of any additional Commissioning Work, to the Owner for review in accordance with the Review Procedure. All updates to the Commissioning Test Report will also be prepared in consultation with, and approved by, the Independent Commissioning Agent and meet the requirements of this Section 33.4.

34. DOCUMENTS AT THE SITE

34.1 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) each Work Plan; and

(h) the Health and Safety Plan.

35. CLEANUP AND FINAL CLEANING OF WORK

35.1 The Design-Builder will maintain the Work in a tidy and safe condition and free from the accumulation of waste products and debris, other than that caused by the Owner, Other Contractors or their employees.

35.2 The Design-Builder will promptly remove all surplus products, tools, construction machinery and equipment, and any waste and debris.

35.3 The Design-Builder will:

(a) perform a full construction project cleaning of the interior of the Building and any areas of the Existing Gymnasium in which the Design-Builder performed any Work in accordance with the requirements of this Agreement, including the Statement of Requirements, when required by the Statement of Requirements and on or before the Substantial Completion Date for the Building;

(b) perform a full construction project cleaning of the exterior of the Building and the Existing Gymnasium, including all windows, on or before the Substantial Completion Date for the Project;

(c) leave the Building and the Existing Gymnasium safe, clean and suitable for occupancy and use by the Owner by the Substantial Completion Date for the Building; and

(d) leave the Facility clean and suitable for occupancy and use by the Owner by the Substantial Completion Date for the Project,

in accordance with the Owner's standards of cleanliness.

35.4 The Design-Builder will leave the Site safe, clean and suitable for occupancy and use by the Owner by the Substantial Completion Date for the Project.

35.5 In connection with any Work performed in the Building or the Existing Gymnasium, or on the remainder of the Facility, after the applicable Substantial Completion Date, the Design-Builder will at all times leave the Work and Site safe, clean and suitable for occupancy and use by the Owner but is not required to remove waste caused by the Owner.

36. REMEDIAL WORK

36.1 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.

36.2 The Design-Builder will coordinate the Time Schedule for the Work to ensure that the requirement under Section 36.1 is kept to a minimum.

36.3 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.

37. REJECTED WORK

37.1 Defective or deficient Work, whether the result of poor design, poor work, use of defective or deficient equipment or materials, or damage through carelessness, default or other acts of the Design-Builder or any Design-Builder Person, 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 any other requirements of this Agreement, including applicable Laws or Standards, will be removed promptly by the Design-Builder and replaced and re-executed promptly and properly at the Design-Builder's expense.

37.2 If the Design-Builder does not remove such defective or deficient 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.

37.3 Any work of the Owner or Other Contractors that is destroyed or damaged by such removals or replacements will be made good by the Design-Builder promptly at the Design-Builder's expense.

38. WARRANTY

38.1 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 for the Building (the "***Warranty Period***").

38.2 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.

38.3 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.

38.4 If the Owner carries out or has others carry out the rectification work pursuant to Section 38.3 the Design-Builder remains responsible for the Work (including the rectification work).

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

38.6 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 38.1.

38.7 Issuance of the Substantial Completion Certificates and the Total Completion Certificate, and final payment to the Design-Builder, do not relieve the Design-Builder from its responsibility under this Section 38.

39. TITLE AND RISK

39.1 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.

39.2 The Work will remain under the care, custody and control of the Design-Builder and at the risk of the Design-Builder until, in respect of the Work required for Substantial Completion of the Building:

(a) Substantial Completion of the Building; or

(b) such earlier date determined by the Owner, and notified in writing to the Design-Builder, for occupancy and use by the Owner.

All other Work will be under the care, custody and control of the Design-Builder until Substantial Completion of the Project is achieved, unless otherwise agreed in writing by the Owner. The Design-Builder will exercise all reasonable care to avoid loss of, or damage to, the Work.

39.3 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

40. APPLICATIONS FOR PAYMENT

40.1 The Design-Builder will make applications for payment in accordance with this Section 40.

40.2 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.

40.3 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.

40.4 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 Payment Certifier's directions. 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 Payment Certifier's comments on such Schedule of Values or such other basis as determined by the Payment Certifier.

40.5 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.

40.6 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 40.3;

(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 40.7 or 40.8;

(i) a detailed description of any completed and/or rectified item(s) on the applicable Substantial Completion Deficiency List for which the Design-Builder is seeking release of a portion of the Warranty Holdback or the amount withheld pursuant to Section 44.5(b)(ii);

(j) 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;

(k) 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;

(l) 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; and

(m) a Quarterly Labour Report prepared in accordance with the Quarterly Labour Reporting Requirements, commencing with the third application for payment following the Effective Date and with every third monthly application for payment thereafter until the Substantial Completion Date for the Project.

40.7 Design-Builder will make applications for:

(a) release of the Lien Holdback under Section 42;

(b) release of the Performance Holdbacks pursuant to and in accordance with this Section 40 and the terms of Section 43;

(c) release of the amounts withheld pursuant to Section 44.5(b)(ii) pursuant to and in accordance with this Section 40 and the terms of Section 44;

(d) any payment at Substantial Completion of the Building, Substantial Completion of the Project or Total Completion pursuant to and in accordance with this Section 40 and the terms of Section 44; and

(e) any other amounts withheld or amounts owing in accordance with the Agreement.

40.8 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 45.2;

(f) issued for construction Drawings and Specifications (including any supplemental instructions, revisions or modifications thereto);

(g) Commissioning Plan commencing with the first application for payment 365 days prior to the Target Building Substantial Completion Date; and

(h) the Quarterly Labour Report commencing on the third application for payment following the Effective Date and with every third application for payment thereafter until the Substantial Completion Date for the Project.

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 40.8(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 consultation with the Owner's Consultant may in accordance with Section 40.10 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.

40.9 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.

40.10 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.

40.11 Provided the Design-Builder is not in material default of any provision in this Agreement, the Owner will pay the Design-Builder within 10 Business Days of the Payment Certifier approving or adjusting the Design-Builder's application for payment in accordance with Section 40.10 and the Schedule of Values.

40.12 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.

41. TAXES AND DUTIES

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

41.2 The Design-Builder will remit all customs duties and taxes to the applicable Authority Having Jurisdiction as and when required by the relevant Law and will without limiting Section 58, 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.

41.3 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.

41.4 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.

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

42. LIEN HOLDBACK

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

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

42.3 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).

42.4 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.

42.5 Without limiting Section 58, 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 42.5 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.

43. PERFORMANCE HOLDBACKS

43.1 In addition to the Lien Holdback and any other amounts permitted to be retained under this Agreement, the Owner will retain:

(a) a holdback of of the Contract Price (the "***LD Holdback***") if at any time after the date that is 6 months before the Target Building Substantial Completion Date (or if the Owner has extended the Contract Time in accordance with this Agreement, such other date established for the Target Building Substantial Completion Date), the Owner's Consultant determines that:

(i) the Substantial Completion Date for the Building is not reasonably likely to occur on or before the Target Building Substantial Completion Date (or if the Owner has extended the Contract Time in accordance with this Agreement, such other date established for the Target Building Substantial Completion Date); or

(ii) the Substantial Completion Date for the Project is not reasonably likely to occur on or before the Target Project Substantial Completion Date (or if the Owner has extended the Contract Time in accordance with this Agreement, such other date established for the Target Project Substantial Completion Date); and

(b) a holdback pursuant to and in accordance with Section 44.5(b)(i), that is the greater of:

(i) ; and

(ii) the amount determined by the Payment Certifier to be equal to times the estimated cost to correct and/or complete each item of Work (other than the items identified in Sections 44.3(e)(i), 44.3(e)(ii) and 44.3(e)(iii)) that is still to be satisfactorily completed or corrected to address the issues specified in the Substantial Completion (Building) Deficiency List,

(the "***Warranty Holdback***"),

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

43.2 The LD Holdback will be calculated as a percentage of the Contract Price and that percentage will be withheld, in accordance with Section 43.1(a), from payments due by the Owner. The percentage applicable to payments will be adjusted as required from time to time if the Contract Price is adjusted.

43.3 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 of the Project.

43.4 The Owner will release the Warranty Holdback to the Design-Builder as follows:

(a) as defects, deficiencies and items of incomplete Work (other than the items identified in Sections 44.3(e)(i), 44.3(e)(ii) and 44.3(e)(iii)) included on the Substantial Completion (Building) Deficiency List are completed or corrected, the Owner will release the portion of the Warranty Holdback corresponding to times the cost to complete such Work, or correct such defects and deficiencies, in each case as determined by the Payment Certifier provided that the aggregate amount of all amounts released pursuant to this Section 43.4(a) will not under any circumstances:

(i) exceed 50% of the Warranty Holdback retained by the Owner; or

(ii) reduce the Warranty Holdback retained by the Owner to an amount that is less than ; and

(b) the remainder of the Warranty Holdback (corresponding to an amount equal to the greater of of the Warranty Holdback) will be retained and released upon the completion of the Warranty Period and satisfaction of all obligations of the Design-Builder under Section 38, less deductions for amounts owing to the Owner.

43.5 The Owner may apply the Performance Holdbacks against any amount owing by the Design-Builder to the Owner either prior to the Total 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.

43.6 The Design-Builder will apply for payment of the applicable Performance Holdback pursuant to, and in accordance with, Section 40 and the terms of this Section 43.

43.7 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.

43.8 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.

44. SUBSTANTIAL COMPLETION AND TOTAL COMPLETION

44.1 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 of the Building or Substantial Completion of the Project, as described in this Section 44 and has provided to the Owner the items as required in Section 44.2 or 44.3, as applicable.

44.2 "**Substantial Completion of the Building**" 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 Building and the Existing Gymnasium are ready for use by the Owner or are being used by the Owner for the purpose intended;

(c) the following items have been submitted to the Owner or completed by the Design-Builder:

(i) all equipment, electrical, mechanical and other systems and sub-systems for the Facility, including the electrical systems; lighting control system; LAN; BMS; heating, ventilation and air conditioning systems; exhaust air systems; heat recovery systems; geoexchange; plumbing and sanitary system; fire protection system; fire alarm system; security/intrusion system; communication system; audio-visual system; permanent integration and connection of the School with the Existing Gymnasium; accessible facilities; and furniture, fixtures and equipment (excluding only the items of Work identified in Sections 44.3(e)(i), 44.3(e)(ii) and 44.3(e)(iii)) are in place, Commissioned, have received all required certifications, and are fully operational;

(ii) all final hard surface pedestrian routes providing access to the Building and the Existing Gymnasium, including all final hard surface pedestrian routes connecting the School with the Existing Gymnasium, have been completed in accordance with the requirements of this Agreement, including the Statement of Requirements, and all applicable Laws and Standards;

(iii) a complete Project Binder (one electronic copy on a flashdrive, unless directed to use a different format by the Owner, and 3 complete hard copy binder sets), 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 identified in Sections 44.3(e)(i), 44.3(e)(ii) and 44.3(e)(iii) that remain to be completed;

(iv) successful completion of all Commissioning Work (excluding only the Commissioning of the items of Work identified in Sections 44.3(e)(i), 44.3(e)(ii) and 44.3(e)(iii) that remain to be completed), in accordance with the "REVIEWED" Commissioning Plan;

(v) the Commissioning Test Report;

(vi) up to date and current Design Submittals, including Drawings, Specifications and the Energy Model;

(vii) all maintenance and operating tools, replacement parts or products as specified in the Statement of Requirements have been delivered to the Owner at an agreed location or locations on the Site;

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

(ix) 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 of the Building;

(x) all approvals necessary for operation of the Building and the Existing Gymnasium from Authorities Having Jurisdiction;

(xi) the final occupancy permit for:

(A) the Building as required from Authorities Having Jurisdiction; and

(B) the Existing Gymnasium, if required by an Authority Having Jurisdiction, in addition to the final occupancy permit for the Building;

(xii) 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;

(xiii) demonstration and training of all mechanical and electrically operated devices (excluding only the mechanical and electrically operated devices associated with the Work identified in Sections 44.3(e)(i), 44.3(e)(ii) and 44.3(e)(iii) that remain to be completed), to the Owner's operating and maintenance staff;

(xiv) all training and all maintenance manuals, product information and operating instructions required by the Statement of Requirements (excluding only the training, maintenance manuals, product information and operating instructions for those items of Work identified in Sections 44.3(e)(i), 44.3(e)(ii) and 44.3(e)(iii) that remain to be completed);

(xv) the written report from the Independent Commissioning Agent in accordance with Section 33.3;

(xvi) the applicable requirements of Section 35 have been fulfilled as required for the Substantial Completion of the Building; and

(xvii) the FortisBC and BC Hydro compliant energy assessment(s), energy model(s) and energy report(s), as required by and in accordance with Section 11.3;

(xviii) the two multi-purpose fields have been completed in accordance with the requirements of this Agreement, including the Statement of Requirements, and all applicable Laws and Standards;

(xix) all irrigation equipment, systems and sub-systems associated with both multi-purpose fields are in place, Commissioned, have received all required certifications, and are fully operational;

(xx) any other conditions specified in this Agreement with respect to achieving Substantial Completion of the Building;

(d) a comprehensive list of all incomplete Work, defects and deficiencies, including an estimated value for each item, has been submitted to the Owner by the Design-Builder which will be supplemented by the Owner acting reasonably; and

(e) a schedule for completion of all remaining Work and correction of all defects and deficiencies, acceptable to the Owner acting reasonably, has been submitted to the Owner by the Design-Builder.

44.3 "**Substantial Completion of the Project**" means that, in addition to all of the requirements for "Substantial Completion of the Building" as described in Section 44.2, all of the following have been achieved:

(a) the Substantial Completion Certificate for the Building has been issued;

(b) all defects, deficiencies and items of incomplete Work identified in the Substantial Completion (Building) Deficiency List have been corrected and/or completed to the Owner's satisfaction;

(c) the whole Facility and Site are ready for use by the Owner or are being used by the Owner for the purpose intended;

(d) the entire Work has been performed to the requirements of this Agreement, including the Statement of Requirements, excluding only the items of Work identified in Sections 44.12(a)(i), 44.12(a)(ii), 44.12(a)(iii) and 44.12(d) and any minor defects and deficiencies on the Substantial Completion (Project) Deficiency List that that do not impair the Owner's use, enjoyment or operation of Project;

(e) the following items have been submitted to the Owner or completed by the Design-Builder:

(i) all paving Work, vehicular access routes, line painting Work, exterior lighting and any other hardscape Work have been completed in accordance with the requirements of this Agreement, including the Statement of Requirements, and all applicable Laws and Standards;

(ii) all remaining turf and soft landscaping Work and the fully accessible playground have been completed in accordance with the requirements of this Agreement, including the Statement of Requirements, and all applicable Laws and Standards; and

(iii) all irrigation equipment, systems and sub-systems are in place, Commissioned, have received all required certifications, and are fully operational;

(iv) successful completion of all Commissioning Work in accordance with the "REVIEWED" Commissioning Plan;

(v) an updated Project Binder (in the same format as required by Section 44.2(c)(iii)), including updated Commissioning reports and inspections, certificates, guarantees and warranties, and certifications;

(vi) updated Design Submittals, including Drawings, Specifications and the Energy Model;

(vii) all Design Submittals, including the Drawings and Specifications associated with the Work identified in Sections 44.3(e)(i), 44.3(e)(ii) and 44.3(e)(iii);

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

(ix) 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 of the Project;

(x) all approvals necessary for operation of the Facility from Authorities Having Jurisdiction;

(xi) the final occupancy permit for the Facility if required by an Authority Having Jurisdiction, in addition to the final occupancy permit for the Building;

(xii) 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;

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

(xiv) all training and all maintenance manuals, product information and operating instructions required by the Statement of Requirements;

(xv) the written report from the Independent Commissioning Agent in accordance with Section 33.3;

(xvi) the requirements of Section 35 have been fulfilled; and

(xvii) any other conditions specified in this Agreement with respect to achieving Substantial Completion of the Project;

(f) a comprehensive list of all incomplete Work, defects and deficiencies, including an estimated value for each item, has been submitted to the Owner by the Design-Builder which will be supplemented by the Owner acting reasonably; and

(g) a schedule for completion of all remaining Work and correction of all defects and deficiencies, acceptable to the Owner acting reasonably, has been submitted to the Owner by the Design-Builder.

44.4 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 from the Design-Builder for a Substantial Completion Certificate, review and assess the Work to verify that the application and the Work conform to the requirements set out in Section 44.2 or 44.3, as the case may be. 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 applicable Substantial Completion Certificate and the Payment Certifier 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 of the Building or Substantial Completion of the Project, as applicable, has been achieved. When the Payment Certifier determines that Substantial Completion of the Building or Substantial Completion of the Project has been achieved, the Payment Certifier will issue:

(a) the applicable Substantial Completion Certificate;

(b) a written list of items of the Work to be corrected and/or completed that were apparent to the Payment Certifier upon its review and assessment of the Work and the Design-Builder's application for the applicable Substantial Completion Certificate (the "***Substantial Completion (Building) Deficiency List***" or the "***Substantial Completion (Project) Deficiency List***", as applicable)

(c) the Payment Certifier's estimate of the cost to correct and/or complete each item of Work included in the applicable Substantial Completion Deficiency List.

Following the issuance of each Substantial Completion Certificate, the Payment Certifier, in cooperation with the Owner and the Owner's Consultant and with input from the Design-Builder's Consultant, will establish a reasonable date for Work still to be satisfactorily completed or corrected, as specified in the applicable Substantial Completion Deficiency List and for Total Completion. The Design-Builder will be responsible for all costs of any additional reviews by the Payment Certifier after the first review that are necessary under this Section, where such additional reviews reveal

that previously identified deficiencies, incomplete Work or non-conformances to the requirements set out in Section 44.2 or 44.3, as the case may be, have not been corrected or completed in a manner satisfactory to the Payment Certifier. Such costs will be deducted from any monies then due to the Design-Builder.

The issuance of the Substantial Completion Deficiency Lists does not relieve the Design-Builder from its obligation to complete all Work and correct all defects and deficiencies (whether or not included in the applicable Substantial Completion Deficiency List), in accordance with this Agreement.

44.5 The Owner:

(a) may retain out of the amount due and owing to the Design-Builder upon each of Substantial Completion of the Building and Substantial Completion of the Project:

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

(ii) any amount withheld pursuant to Section 42.5; and

(b) will retain out of the amount due and owing to the Design-Builder upon:

(i) Substantial Completion of the Building, the Warranty Holdback, in accordance with Section 43; and

(ii) Substantial Completion of the Project, an amount determined by the Payment Certifier to be equal to 2 times the estimated cost to correct and/or complete each item of Work that is still to be satisfactorily completed or corrected to address the issues specified in the Substantial Completion (Project) Deficiency List.

44.6 No payment will be made to the Design-Builder from the amounts withheld under Section 44.5(b)(ii) in connection with the Work that is still to be satisfactorily completed or corrected to address the issues specified in the Substantial Completion (Project) Deficiency List, until the completion or correction of all of the defects, deficiencies and incomplete Work specified in the Substantial Completion (Project) Deficiency List. The Design-Builder will apply for payment of the amounts withheld under Section 44.5(b)(ii) and payment will be made in accordance with Section 40.

44.7 The Design-Builder will perform the Work specified in the Substantial Completion Deficiency Lists 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.

44.8 The Owner may carry out, or have others carry out, the Work specified in the Substantial Completion Deficiency Lists at the Design-Builder's cost if:

(a) the Design-Builder does not complete the Work by the date established by the Payment Certifier in Section 44.4 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.

44.9 If the Owner carries out or has others carry out the Work pursuant to Section 44.8 the Design-Builder remains responsible for the Work.

44.10 The Design-Builder will correct, at its own cost, or pay the Owner for any damage resulting from the Work specified in the Substantial Completion Deficiency Lists.

44.11 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 44.12 and has provided to the Owner the items as required in Section 44.12(d).

44.12 "**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 Sections 13.1(b) and 38;

(ii) Work described in Section 5.6.2.5(m) of the Statement of Requirements; and

(iii) the final update to the Commissioning Test Report;

(b) all defects, deficiencies and incomplete Work have been rectified or completed to the Owner's satisfaction;

(c) the requirements of Section 35 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 the Record Drawings in accordance with Section 45;

(ii) the final Project Binder (one electronic copy on a flashdrive, unless directed to use a different format by the Owner, and 3 complete hard copy binder sets), including final Commissioning reports, final inspections (structural, environmental, etc.), deficiency reports and the Commissioning Test Report;

(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;

(vi) updated Commissioning Test Report in accordance with Section 33.4; and

(vii) 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.

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

(a) the Payment Certifier will, in cooperation with the Owner and the Owner's Consultant and with input from the Design-Builder's Consultant, subject to the conditions contained in Section 44.12, 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 44.12;

(b) the Payment Certifier will, and not later than 7 days after the review contemplated in Section 44.13(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; and

(c) the Design-Builder will be responsible for all costs of additional reviews required by Section 44.13(b), such costs to be deducted from the monies due to the Design-Builder, where any additional review undertaken by the Payment Certifier pursuant to this Section reveals that previously identified defects, deficiencies or incomplete Work has not been corrected or completed 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 42.5 or any amount set-off in accordance with this Agreement. The date of Total Completion will be as stated in the Total Completion Certificate.

44.14 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.

44.15 By issuing any certificate, the Owner, the Owner's Representative, the Owner's Consultant, any other person on behalf of the Owner or 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 Representative, the Owner's Consultant, any other person on behalf of the Owner 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.

44.16 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.

44.17 In the event of conflict between the provisions of this Section 44 and any other Section of this Agreement, the provisions of this Section 44 govern.

44.18 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.

45. PROJECT BINDER AND RECORD DRAWINGS

45.1 The Design-Builder will prepare, compile and maintain a complete set of Project documentation, including the following:

(a) Commissioning reports satisfactory to the Owner;

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

(c) maintenance manuals, product information and operating instructions;

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

(e) air and water balancing reports;

(f) all shop drawings including the relevant consultant's review stamp and comments;

(g) confirmation of the Design-Builder's Consultant in accordance with Section 16.3(b);

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

(i) 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,

(the "**Project Binder**").

45.2 The Project Binder will be:

(a) prepared and maintained in accordance with Good Industry Practice;

(b) logically organized as a single, integrated and consolidated, set of documents;

(c) updated on a monthly basis with all documentation related to Work completed up to the date of the update;

(d) electronically available to the Owner's Representative, the Owner's Consultant, other designated Owner personnel and the Payment Certifier, in PDF format at all times throughout the Term;

(e) downloadable by the Owner's Representative, the Owner's Consultant, other designated Owner personnel and the Payment Certifier at any time;

(f) bound in at least 3 D-Ring binders, with separate binders for mechanical systems and electrical systems, that are no larger than 3 inches; and

(g) submitted to the Owner in accordance with Sections 44.2(c)(iii), 44.3(e)(v) and 44.12(d)(ii).

45.3 Before the date on which the Owner is required to make the first payment, the Design-Builder will submit for review by the Owner, the proposed organization and structure of the Project Binder, and establish electronic access to the Project Binder for the Owner's Representative, the Owner's Consultant, other designated Owner personnel and the Payment Certifier. The Design-Builder will:

(a) operate and maintain the electronic access to the Project Binder until the Total Completion Date; and

(b) ensure that the electronic copy of the Project Binder mimics the intended use, organization, structure and format of the hardcopy version of the Project Binder, with all content including the index, all sections and all appendices, figures and other information, combined into a single, tabbed and linked file.

45.4 Within 60 days after achieving each of Substantial Completion of the Building and Substantial Completion of the Project, the Design-Builder will provide to the Owner the following:

(a) 2 complete sets of paper print Record Drawings, signed and sealed by the Design-Builder's Consultant in accordance with Good Industry Practice, and identified in bold letters with the words "RECORD DRAWINGS"; and

(b) 1 complete copy of the Record Drawings on a flashdrive, unless directed to use a different format by the Owner, acting reasonably, in BIM (Building Information Modelling), AutoCAD DWG and Adobe PDF format.

46. CASH ALLOWANCES

46.1 This Section 46 applies only if cash allowances are stated in this Agreement.

46.2 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.

46.3 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.

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

46.5 Where the actual costs expended by the Design-Builder for work under a cash allowance exceed the amount of the cash allowance, then, subject to the Design-Builder's compliance with Sections 46.9(c) and 46.9(d), the Design-Builder will be compensated for any excess costs incurred and substantiated, plus an amount for overhead and profit as set out in Section 49.2(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.

46.6 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.

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

46.8 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.

46.9 The Contract Price includes a $1,000,000 cash allowance (the "***Intersection Upgrade Cash Allowance***") for any intersection upgrade work that the Design-Builder may be required to perform:

(a) pursuant to a permit issued in relation to the Project by the British Columbia Ministry of Transportation and Infrastructure ("***MOTI***"); and/or

(b) within the MOTI right-of-way at the intersection of Highway 97 with any of Herbert Road, Elliott Road, Brown Road or Hoskins Road in West Kelowna, British Columbia, pursuant to a permit issued for the Project by the City of West Kelowna,

(collectively, the "***Intersection Upgrade Work***").

If, at any time, the actual costs expended by the Design-Builder to perform the Intersection Upgrade Work exceed the Intersection Upgrade Cash Allowance, the Design-Builder must:

(c) provide to the Owner an estimate of the cost to complete the Intersection Upgrade Work, including a cost breakdown in sufficient detail to support the cost estimate; and

(d) obtain written approval from the Owner,

prior to proceeding any further with the Intersection Upgrade Work.

If, after obtaining such approval and proceeding, the actual costs expended by the Design-Builder exceed the Intersection Upgrade Cash Allowance, then in addition to the compensation referred to in Section 46.5, the Design-Builder will be entitled to claim an extension of the Contract Time in accordance with Section 51.

PART E – CHANGES

47. CHANGES

47.1 The Owner, without invalidating this Agreement, may require Changes, with the Contract Price and Contract Time adjusted in accordance with Section 48. 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.

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

47.3 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 28.4, 29.2 and 30.4.

47.4 If during the performance of the Work, the Design-Builder receives a direction or instruction from the Owner, Owner's Representative or Owner's Consultant that the Design-Builder, acting reasonably, believes to be a Change and for which a Change Order or Change Directive has not been issued, the Design-Builder will promptly, and in any event prior to implementing such direction or instruction, notify the Owner of:

(a) the specific direction or instruction that the Design-Builder believes to be a Change;

(b) the reasons why the Design-Builder believes the direction or instruction to be a Change, including details of the specific Work that is alleged to have changed; and

(c) confirmation that the Design-Builder does not intend to proceed with the direction or instruction without a Change Order or Change Directive.

Upon receipt of a notice pursuant to this Section 47.4, the Owner will review the direction or instruction, the Design-Builder's notice and any supporting documentation, and will within 7 Business Days:

(d) withdraw the direction or instruction;

(e) issue a Change Order or Change Directive in respect of the direction or instruction; or

(f) confirm that the direction or instruction is not a Change.

If the Owner determines that the direction or instruction is not a Change, the Design-Builder will promptly implement the direction or instruction, without prejudice to its right to dispute such determination, provided that the Owner's determination will become final and may not be disputed unless, within 30 days after receipt of such determination, the Design-Builder issues a dispute notice in accordance with Section 63.2.

47.5 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.

48. VALUATION AND CERTIFICATION OF CHANGES

48.1 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).

48.2 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.

48.3 In the case of Changes to be paid for under Section 48.2(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.

48.4 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 Procedure described in Section 63 by determining the cost of the Change in accordance with Section 49 (other than Sections 49.1 and 49.4) and by determining the adjustment of the Contract Time as a reasonable time taking into account the critical path.

48.5 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 48.

49. DETERMINATION OF COST

49.1 Subject to Section 49.2 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.

49.2 If the Design-Builder and the Owner cannot agree as to the cost of the Change as contemplated in Section 49.1, 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 incremental expenditures described in Section 49.3; plus

(b) to cover other costs, including overhead and profit, the following applicable markup on the amounts charged pursuant to Section 49.2(a).

(i) 5%, when the expenditure is a payment to a Subcontractor pursuant to Section 49.3(a); or

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

49.3 Classes of incremental expenditure that are allowable for the Work that is the subject matter of the Change (all without additional markups except as otherwise noted in Section 49) for the purposes of Section 49.2 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 Work;

(b) wages, salaries and reasonable 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, testing and 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.

49.4 If the Design-Builder and the Owner cannot agree as to the cost of labour, equipment or material as contemplated in Section 49.1, 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.

49.5 The applicable markup set out in this Section 49 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.

50. CHANGE DIRECTIVE

50.1 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.

50.2 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

51. DELAYS

51.1 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 by any court or Authority Having Jurisdiction (providing such order was not issued as the result of any act or fault of the Design-Builder or any Design-Builder Person), or the events referred to in Sections 28.4, 29.2 or 30.4, 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 reasonable costs directly incurred by it as the result of such delay, determined in accordance with Section 49; or

(b) if the Owner determines that the Target Building Substantial Completion Date or Target Project 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 Building Substantial Completion Date or Target Project 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 49.2(b) incurred by it as a result of undertaking such acceleration efforts.

51.2 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 Building Substantial Completion Date or Target Project 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 Building Substantial Completion Date or Target Project 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 49.2(b) incurred by it as a result of undertaking such acceleration efforts.

Except as provided in Section 51.2(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.

51.3 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 51 or if the Design-Builder does not perform the Work substantially in accordance with the Time Schedule to meet the Target Building Substantial Completion Date and Target Project Substantial Completion Date, the Design-Builder will at its cost accelerate the Work to meet the Target Building Substantial Completion Date and Target Project Substantial Completion Date.

51.4 The Design-Builder is not entitled to any extension of time or any reimbursement of costs for delay under this Section 51 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.

51.5 In the case of any delay under Section 51.1 or Section 51.2 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

52. NON-DEFAULT SUSPENSION/TERMINATION

52.1 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, in whole or in part, 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.

52.2 Without limiting Section 52.1, 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 all or part of 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 48 and Section 49 as determined to be necessary.

52.3 The Owner will within 2 Business Days after a Change under Section 52.2(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.

52.4 The Design-Builder upon receiving notice of suspension or termination from the Owner will immediately suspend operations as required by such notice, except those operations 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.

52.5 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.

52.6 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:

(a) all direct costs reasonably incurred by the Design-Builder in complying with the suspension; and

(b) for all direct costs reasonably incurred for acceleration of the Work so that Substantial Completion of the Building is achieved by the Target Building Substantial Completion Date and Substantial Completion of the Project is achieved by the Target Project Substantial Completion Date, where the Owner requires such acceleration by written notice to the Design-Builder,

in each case, determined in accordance with Section 49.

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 either or both Substantial Completion of the Building by the Target Building Substantial Completion Date and Substantial Completion of the Project by the Target Project Substantial Completion Date, despite an intended acceleration of the Work, the Owner and the Design-Builder will, acting reasonably, agree on a new Target Building Substantial Completion Date and/or Target Project Substantial Completion Date, as applicable.

52.7 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 direct costs reasonably incurred by the Design-Builder in complying with the suspension, determined in accordance with Section 49.

52.8 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.

52.9 If this Agreement is terminated pursuant to this Section 52:

(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 direct costs reasonably incurred by the Design-Builder in complying with the suspension or termination order, determined in accordance with Section 49, less any costs already paid to the Design-Builder pursuant to Section 52.6; and

(b) the Owner will be entitled to:

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

(ii) take possession of all Design Submittals, including the Drawings, Specifications and the Energy Model, 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.

52.10 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 52.

52.11 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 Authority Having Jurisdiction through no act or fault of the Design-Builder or any Design-Builder Person.

53. DEFAULT AND TERMINATION OF AGREEMENT

53.1 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.

53.2 If a default referred to in Section 53.1 occurs, other than a default referred to in Section 53.1(a) or 53.1(b), the Design-Builder will remedy the default within a 7 day rectification period after the notice given under Section 53.1. 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.

53.3 If a default referred to in Section 53.1(a) or 53.1(b) occurs or if the Design-Builder fails to remedy any other default within the rectification period described in Section 53.2 or fails to provide a schedule acceptable to the Owner for remedying the default within the period described in Section 53.2 or fails to remedy the default 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.

53.4 If the Owner terminates the Design-Builder's right to continue with all or part of the Work or terminates this Agreement pursuant to Section 53.3, the Owner will be entitled to:

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

(b) take possession of all Design Submittals, including the Drawings, Specifications and the Energy Model, 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 38 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 38 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.

53.5 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.

53.6 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.

54. TERMINATION BY THE DESIGN-BUILDER

54.1 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 40.10 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 Authority Having Jurisdiction (providing that such order was not issued as the result of any act or fault of the Design-Builder or any Design-Builder Person) for a period of 90 days.

54.2 If a default referred to in Section 54.1 occurs, the Owner will remedy the default within a 21 day rectification period after the notice given under Section 54.1 or within such extension thereof established by the Design-Builder.

54.3 If the Owner fails to remedy the default within the rectification period described in Section 54.2 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.

54.4 If the Design-Builder terminates this Agreement in accordance with Section 54.3(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

55. REPRESENTATIONS AND WARRANTIES

55.1 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 55.1(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 for the Building, Substantial Completion Date for the Project and Contract Price, (or any of them), except for the objective geotechnical data and the objective traffic count data that can be relied upon for accuracy (to the extent permitted by Section 28.1(c)) 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 28.1(c), in respect of the accuracy of the objective geotechnical data and the objective traffic count data, 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 the objective geotechnical data and the objective traffic count 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.

(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 equal or better qualifications, expertise and experience 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;

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

(vii) the possession or Use of Project Intellectual Property by or on behalf of the Owner in accordance with this Agreement will not infringe, violate or misappropriate the Intellectual Property or any other rights of any person, except that the foregoing does not apply to an infringement, violation or misappropriation caused by a modification of the Project Intellectual Property by the Owner or on behalf of the Owner by a person other than the Design-Builder or a Design-Builder Person.

55.2 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

56. PROTECTION OF WORK AND PROPERTY

56.1 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.

56.2 Should any damage occur to the Work, the Site or any property adjacent to the Site for which the Design-Builder is responsible as provided in Section 56.1, 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.

56.3 Should any damage occur to the Work, the Site or any property adjacent to the Site for which the Design-Builder is not responsible as provided in Section 56.1, 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 48 and Section 49.

57. EXCLUSIONS OF LIABILITY

57.1 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 57.1 will not limit any liability the Design-Builder may have under this Agreement to pay liquidated damages.

57.2 Subject to Section 57.3 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 2 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 57.2(a) above, 50% of the Contract Price.

If this Agreement is terminated, the reference in this Section 57.2 to the "Contract Price" will be deemed only for purposes of this Section 57.2 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.

57.3 Section 57.2 will not limit the Design-Builder's liability in connection with:

(a) abandonment, 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;

(e) penalties, fines or other liability imposed by any Authority Having Jurisdiction for breach of applicable Law; and

(f) the Design-Builder's obligations pursuant to Section 65.

57.4 Nothing in this Section 57 will be construed to limit the liability of an insurer under the insurance required to be maintained under this Agreement.

58. INDEMNIFICATION

58.1 The Design-Builder will indemnify and save harmless the Owner and its 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 Design-Builder Person, excepting only liability to the extent arising out of the independent acts of the Indemnified Parties.

58.2 The obligations of the Design-Builder under Section 58 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.

58.3 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.

59. DESIGN-BUILDER'S DISCHARGE OF LIABILITY

59.1 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.

59.2 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 or will cause the Subcontractor to discharge such liabilities when legally obliged to do so.

59.3 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.

59.4 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

60. BONDS

60.1 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.

60.2 Each Bond under Section 60.1 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.

60.3 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.

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

60.5 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.

60.6 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.

60.7 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 this Agreement in accordance with its terms and conditions.

61. INSURANCE

61.1 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.

61.2 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.

62. RECORDS AND AUDIT

62.1 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 Work and completion of all Commissioning Work;

(c) all records relating to any inspections of the Facility conducted under applicable Laws or by or of any Authority Having Jurisdiction;

(d) all orders or other requirements issued to the Design-Builder by any Authority Having Jurisdiction 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.

62.2 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.

62.3 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.

62.4 The Design-Builder will fully cooperate with the Owner to conduct an audit pursuant to this Section 62.

PART K – DISPUTE RESOLUTION

63. DISPUTE RESOLUTION

63.1 All Disputes will be resolved in accordance with the Dispute resolution procedure set out in this Section 63 (the "***Dispute Resolution Procedure***").

63.2 Either party may commence the Dispute Resolution Procedure by giving written notice of a Dispute to the other party briefly setting out the nature of the Dispute, the remedy or relief sought, and a request that the Dispute Resolution Procedure pursuant to this Section 63 be commenced (a "***Notice of Dispute***").

63.3 Following the submission of a Notice of Dispute, the parties agree to use a two-step process to resolve any Dispute, which will be taken in the following order:

(a) first, by referring the Dispute to negotiations among the Senior Management Representatives, pursuant to Section 63.4 below; and

(b) second, by referring the Dispute to arbitration pursuant to Section 63.5 below.

63.4 Upon the submission of a Notice of Dispute pursuant to Section 63.2 above, each of the parties will refer the Dispute to a designated senior management representative with the authority to negotiate and settle the Dispute (the "***Senior Management Representatives***"). The Senior Management Representatives of the parties will then attempt to resolve the Dispute within thirty (30) days after the date of the Notice of Dispute, or such longer period as the Senior Management Representatives may otherwise agree in writing. If the Senior Management Representatives agree upon a resolution of the Dispute, such resolution will be memorialized in a written settlement agreement mutually acceptable to and signed by both of the parties.

63.5 If a Dispute is not resolved by the Senior Management Representatives within thirty (30) days after the Notice of Dispute (or such longer period as the Senior Management Representatives may otherwise agree in writing) pursuant to Section 63.4 above for any reason whatsoever, the Dispute will at the initiation of either party be resolved by binding arbitration administered by the Vancouver International Arbitration Centre ("***VanIAC***") under its applicable Rules (the "***VanIAC Rules***"), except to the extent of conflicts between the VanIAC Rules and the provisions of this Agreement, in which

event the provisions of this Agreement will prevail. The following provisions will apply to an arbitration commenced pursuant to this clause:

(a) the number of arbitrators will be one, who will be appointed in accordance with the VanIAC Rules;

(b) the legal seat of the arbitration will be Vancouver, British Columbia, Canada;

(c) the language to be used in all aspects of the arbitration will be English;

(d) any award issued by the arbitral tribunal will be final and binding on the parties, may be filed in any court of competent jurisdiction, and may be enforced by a party as a final judgment in such court. The parties expressly waive, to the maximum extent permitted by law, any right of appeal of any award, including appeals based on questions of law, questions of fact, questions of mixed law and fact, or otherwise;

(e) the parties will request that the arbitral tribunal render a final award as soon as reasonably practicable after the commencement of an arbitration, taking into consideration the size, nature and complexity of the applicable Dispute and the parties' intent to achieve a just, timely and cost effective determination of the matters in dispute;

(f) any award for monetary damages will be made and payable in Canadian dollars, and may include interest from the date of any breach or violation of this Agreement until paid in full at the rate determined by the arbitrator; and

(g) the parties agree that any arbitration carried out hereunder will be kept strictly private and confidential, and that the existence of the proceedings and any element of it (including but not limited to all awards, the identity of the parties and all witnesses and experts, all materials created for the purposes of the arbitration, all testimony or other oral submissions, all documents disclosed in arbitration and all documents produced by a party that were not already in the possession of the other party) will be kept strictly private and confidential, except (i) with the consent of the parties, (ii) to the extent disclosure may be lawfully required in bona fide judicial proceedings relating to the arbitration, (iii) where disclosure is lawfully required by a legal duty, and (iv) where such information is already in the public domain other than as a result of a breach of this clause. The parties will request that the arbitral tribunal and VanIAC keep any arbitration carried out hereunder strictly private and confidential, including but not limited to all of the foregoing items, and will request that the arbitral tribunal and VanIAC refrain from publishing or disclosing any such items. The parties also agree not to use any information disclosed to them during the arbitration for any purpose other than in connection with the arbitration.

Notwithstanding Section 63.5(g), the Design-Builder acknowledges and agrees that the Owner may disclose any information with respect to any arbitration proceedings, including the existence of the proceedings and any element of it (including but not limited to any awards, the identity of the parties and any witnesses and experts, any materials created for the purposes of the arbitration, any testimony or other oral submissions, any documents disclosed in arbitration and any documents produced by a party that were not already in the possession of the other party, to any provincial ministry, Infrastructure BC Inc. or any Authority Having Jurisdiction).

63.6 The parties agree that while an arbitration is pending pursuant to Section 63.5, the parties will continue to perform their obligations under this Agreement, provided that such performance will be without prejudice to the rights and remedies of the parties and will not be read or construed as a

waiver of a party's right to claim for recovery of any losses suffered as a result of the continued performance of this Agreement.

63.7 Except as otherwise specifically permitted by this Agreement, no undisputed payment due or payable by a party will be withheld on account of a pending arbitration pursuant to this clause.

63.8 Any limitation period imposed by this Agreement or by law in respect of a Dispute shall be tolled upon the delivery of a Notice of Dispute pursuant to Section 63.2 above until such time as the Dispute Resolution Procedure under this Section 63 has concluded.

63.9 The Dispute Resolution Procedure set out in this Section 63 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.

PART L – GENERAL PROVISIONS

64. LAWS, NOTICE, PERMITS AND FEES

64.1 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.

64.2 The Design-Builder will apply for, pay for and obtain the development permit, the building permit, the occupancy permit and all other permits, licences and approvals required for the performance of the Work. 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.

64.3 All applicable Laws in force in British Columbia, as amended from time to time, govern the Work.

64.4 Except as otherwise provided in this Agreement, if after:

(a) the Financial Submission Date an Epidemic Change in Law comes into effect; or

(b) the Effective Date a change to applicable Laws or Standards comes into effect,

either party will be entitled to make a claim for an adjustment in the Contract Price or the Contract Time as a Change.

65. INTELLECTUAL PROPERTY FEES

65.1 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 18.9 or Section 58, 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, including with respect to the granting of any licences, under this Agreement that are attributable to infringement or an alleged infringement of any Intellectual Property right by the Design-Builder or any Design-Builder Person.

66. CONFIDENTIALITY AND COMMUNICATIONS

66.1 Subject to Section 66.2, each party will hold in confidence any Confidential Information received from the other party, except that this Section 66 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, Infrastructure BC Inc. and any Authority Having Jurisdiction which require the information in relation to the Project;

66.2 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 18.5 and any Confidential Information that the Owner is entitled to receive from the Design-Builder pursuant to this Agreement.

66.3 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 66.1 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 66.1.

66.4 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).

66.5 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.

66.6 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.

66.7 The parties will comply with Schedule 4 – Communication Roles.

67. NOTICE

67.1 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:

The Board of Education of School District No. 23 (Central Okanagan)
Central Okanagan Public Schools
Operations Department
685 Dease Road
Kelowna, British Columbia
Canada V1X 4A4

Attention: Stuart Kamstra

Email: stuart.kamstra@sd23.bc.ca

With a copy to:

Attention: Rob Drew

Email: Rob.Drew@sd23.bc.ca

(b) if to the Design-Builder:

Clark Builders (British Columbia) Inc.
Suite 810 – 510 Seymour Street
Vancouver, British Columbia
Canada V6B 3J5

Attention: Randy Kyrzyk

Email: randy.kyrzyk@clarkbuilders.com

With copies to:

(i) Attention: Steven Lenarduzzi

Email: steve.lenarduzzi@clarkbuilders.com; and

(ii) Attention: Risk Management

Email: riskmanagement@clarkbuilders.com

or to such other address or electronic mail address as any party may, from time to time, designate in the manner set out above.

67.2 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, in either case, provided that no indication of a failure of receipt has been received by the sender.

67.3 Delivery by mail will not be considered timely notice under this Agreement.

67.4 In the event of an emergency or urgent matter, in addition to the notice required by this Section 67, 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.

68. LEGAL RELATIONSHIP

68.1 The Design-Builder is an independent contractor and not the servant, employee, partner or agent of the Owner.

68.2 The Design-Builder will not commit the Owner to the payment of any money to any person.

68.3 No partnership, joint venture or agency involving the Owner is created by this Agreement or under this Agreement.

68.4 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.

69. ASSIGNMENT

69.1 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.

69.2 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 18.5, 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.

70. INTEREST

70.1 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 2% per annum over the prime rate, 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.

71. WAIVER

71.1 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.

71.2 No waiver of any right or obligation is a waiver of any other right or obligation under this Agreement.

71.3 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.

71.4 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.

72. ASSUMPTION OF RISK

72.1 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.

73. GENERAL DUTY TO MITIGATE

73.1 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, and 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 73.

74. OTHER PROVISIONS

74.1 The exclusions, waivers and limitations of liability, representations and warranties and indemnities in this Agreement, the provisions of Sections 62, 63, 65, 66 and rights accrued prior to completion or termination of this Agreement will survive the completion or termination of this Agreement.

74.2 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.

74.3 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.

74.4 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.

74.5 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.

74.6 The parties must do everything reasonably necessary to give effect to the intent of this Agreement, including execution of further instruments.

74.7 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.

74.8 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.

74.9 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.

74.10 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.

74.11 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.

74.12 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.

74.13 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.

74.14 Time is of the essence of this Agreement.

74.15 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.

74.16 A party may deliver an executed copy of this Agreement by electronic means but that party will upon request immediately deliver to the other party an originally executed copy of this Agreement.

[Execution Page Follows]

IN WITNESS WHEREOF the parties have executed this Agreement as of the Effective Date.

The Board of Education of School District No. 23 (Central Okanagan)

Per: _____
Authorized Signatory

Per: _____
Authorized Signatory

Clark Builders (British Columbia) Inc.

Per: _____
Authorized Signatory

Per: _____
Authorized Signatory

IN WITNESS WHEREOF the parties have executed this Agreement as of the Effective Date.

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Per: _____
Authorized Signatory

Per: _____
Authorized Signatory

Clark Builders (British Columbia) Inc.

Per: _____
Authorized Signatory

Per: _____
Authorized Signatory

Corporate Seal

SCHEDULE 1

STATEMENT OF REQUIREMENTS

See separate document.

George Pringle Secondary School

Schedule 1
Statement of Requirements

As Issued | February 22, 2024

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APPENDICES

Part 1 Interpretation

1.1 General

1.1.1 This Statement of Requirements (SOR) is written as an output specification and defines what the Design-Builder will achieve in the Design and Construction. Provisions of this Statement of Requirements are in some instances written in the imperative form. Except where otherwise expressly stated within this Statement of Requirements, the Design-Builder will carry out the Design and Construction as required and contemplated by each provision of this Statement of Requirements, including provisions stated in the imperative form.

1.1.2 While the provisions of this Statement of Requirements are intended to be complementary, if there is any conflict within the provisions of this Statement of Requirements or between any documents forming part of the Agreement, Section 1.5 of the Agreement will apply.

1.1.3 Where “cost effective”, “appropriate”, “sufficient”, “minimize” and related and similar terms are used in this SOR, they will be construed and interpreted in terms of whether they are cost effective, appropriate, sufficient or minimize, from the perspective of a prudent public school district owner who balances capital costs against maintenance, operations, security, reliability, and all of the costs over the life of the facility.

1.1.4 Where the Statement of Requirements requires the Design-Builder to use a specific product or material, the Design-Builder may request the Owner accept an equivalent product or material by submitting a written request to the Owner. Any such written request will include a detailed description of the proposed equivalent product or materials, together with such supporting documentation and information as the Owner may require. The Owner may accept or reject, at the Owner’s discretion, any request made by the Design-Builder under this Section. The Design-Builder may, at any time, request that the Owner accept an Equivalent by submitting details of the proposed Equivalent, together with such supporting documentation and information as the Owner may require, under the Review Procedure. Acceptance of an Equivalent may in the discretion of the Owner be withheld or may be granted subject to such conditions as the Owner, in its discretion, considers appropriate.

1.1.5 Unless expressly stated otherwise, each reference in this SOR to a code or standard will be deemed to mean the latest version of that code or standard applicable to the project, including any amendments or supplements thereto, for changes to Laws and Standards.

1.1.6 The Design-Builder will provide an online document management system accessible to the Owner for the design stage and through the end of the construction and warranty period. The online document management system will include functionality to allow the Authority’s on-going access to records after the warranty period.

1.2 Definitions

1.2.1 In this SOR, in addition to the definitions set out in the main body of the Agreement: are the following:

"21st Century Learning" means learning environments and teaching methods which support pedagogical delivery to assist students in developing learning, literacy and life skills consistent with the BC Ministry of Education's Curriculum (available at https://curriculum.gov.bc.ca/curriculum/overview#21-century).

"BMS" means the building management system, a programmable digital control system that can be used to monitor and manage the Facility's mechanical, electrical and electromechanical services.

"Building" means the building, or buildings, to be constructed by the Design-Builder under this Agreement, which building(s) will include both the School and the Neighborhood Learning Centre.

"Category A FFE" means the furniture, fixtures and equipment listed as Category A, Supplied and installed by Design Builder.

"Category B FFE" means the furniture, fixtures and equipment listed as Category B, Supplied by Owner and installed by Design Builder.

"Category C FFE" means the furniture, fixtures and equipment listed as Category C, Supplied and installed by Owner.

"Communications Rooms" means the Main Telecommunications Rooms, the Telecommunications Rooms and the Entrance Facility.

"Component" or **"Functional Component"** means a cohesive grouping of activities or spaces related by service or physical arrangement. A Component may or may not be a department since the term "department" refers to an administrative rather than a functional organization of space.

"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.

"Design Life" means the period of time for which a component, device or system is expected to function within its specified parameters without major repairs.

"Direct Visual Connection" means a line of sight between two spaces from any central area of a room or space, either measured from the central node of the room or space, from a workstation, or from the midpoint of the room or space's entry point. The line of measurement can be across floor plates, levels, corridors or through transparent glazing.

"Entrance Facility" means the main demarcation point of the incoming telecommunications services for the Facility.

"Existing Gymnasium" means the facility to remain located on-the site and operational throughout the construction process for continuous use by the Owner.

"FFE" means collectively Category A FFE, Category B FFE and Category C FFE.

“Gathering Stair” means a large, tiered area for gathering, with access stairs meeting complying with the BCBC for use as a stair, and larger tiers for use as seating surfaces.

“Gender Neutral” means a space that is designed to be accessible by all peoples, regardless of gender identity or sexual orientation.

“Gross Square Metres” or **“GSM”** means the sum of all Building floor areas measured to the outside face of exterior walls for all stories or areas having floor surfaces within a Building, including component gross area, general circulation, mechanical, electrical space and exterior walls.

“Indicative Design” means the indicative design included in the Disclosed Data.

"Local Area Network" or **"LAN"** means is the communications network that interconnects devices throughout the Facility using the structured cabling system.

“Main Telecommunications Room” or **“MTR”** has the meaning set out in Section 8.8.4.2.

“Natural Light” means direct natural light sourced from the sun.

“Neighbourhood Learning Centre”, means the portion of the Facility, excluding the School, to be used as a childcare centre and as an Indigenous space.

“Net Area” or **“Net Square Metres** or **“NSM”** means the horizontal area of space assignable to a specific function. The Net Area of space is measured to the inside face of wall surfaces.

“Occupant” means any Staff, student, visitor, service provider, or other person who is within the confines of the Building but does not include anyone using a part of the Facility that is outside of the Building.

“Public Plaza” means a paved area used as the main access to the Building and is open to members of the community.

“Room Data Sheets” means Appendix 1B.

“**School**” means the portion of the Facility to be used as a school, excluding the Neighborhood Learning Centre, but includes parts of the Facility that are located outside the Building that are being used as a part of the School.

“**Staff”** means employees of the Owner.

“Telecommunications Room” or **“TR”** has the meaning set out in Section 8.8.4.3.

1.3 Acronym List

ADA - Americans with Disabilities Act -
AFUE - Annual Fuel Utilization Efficiency
AHC - Architectural Hardware Consultant
ANSI - American National Standards Institute
AIBC – Architectural Institute of British Columbia
AMPP – Association for Materials Protection and Performance
ASHRAE - American Society of Heating, Refrigerating and Air-conditioning Engineers
ASME - American Society of Mechanical Engineers
ASPE - American Society of Plumbing Engineers
ASTM - American Society for Testing and Materials
AV / IT – Audio Visual / Information Technology
AWWA – American Water Works Association
BCBC – British Columbia Building Code
BCICA - British Columbia Insulation Contractors Association
BICSI - Building Industry Consulting Service International
BMS - Building Management System
CATV – Community Access Television
CCTV – Closed Circuit Television
CEC – Canadian Electrical Code
CFC – Chlorofluorocarbon
CGA - Compressed Gas Association
CODEC – Coder/Decoder
CPTED - Crime Prevention Through Environmental Design
CPU – Central Processing Unit
CSA - Canadian Standards Association
DDC - Direct Digital Controls
DHI - Door and Hardware Institute of Canada
EIA/TIA – Electronics Industry Association/Telecommunications Industry Association
EF – Entrance Facility
EMT – Electric Metallic Tubing
ESC – Electronic Security Control
ESCS - Electronic Security and Communication System
ESS - Electronic Security Systems
FA – Fire Alarm
FACP – Fire Alarm Control Panel
FE – Fire Extinguisher
FM – Factory Mutual
GN – Gender Neutral
GSM – Gross Square Metres
GWB – Gypsum Wall Board
HEPA - High Efficiency Particulate Air
HP – Horsepower
HRC – High Rupturing Capacity (fuse type)

HVAC - Heating, Ventilating and Air-Conditioning
IAQ-Interior Air Quality
IC - INT systems System
IDS – Intrusion Detection System
IEEE - Institute of Electrical and Electronic Engineers
IP – Internet Protocol
IT – Information Technology
IMIT – Information Management Information Technology
INT - Intercom
ISO – International Organization for Standardization
KV – Kilovolt
KVA – Kilovolt Ampere
LAN – Local Area Network
LCD – Liquid Crystal Display
LED – Light Emitting Diode
MPI – Master Painters Institute
NAAWS – North American Architectural Woodwork Standards
NLC – Neighborhood Learning Centre
NEMA - National Electrical Manufacturers Association
NFPA - National Fire Protection Association
NRC-National Research Council
NSM – Net Square Metres
PA – Paging Announcement / Public Address (Paging System)
PBX – Private Branch Exchange
PC – Personal Computer
PoE – Power Over Ethernet
PPE - Personal Protective Equipment
PTZ – Pan Tilt Zoom
PVC – Polyvinyl Chloride
RCDD – Registered Communications Distribution Designer
RCABC – Roofing Contractors Association of British Columbia
SHGC - Solar Heat Gain Coefficient
SLC – Security Level Classification
SMACNA – Sheet Metal and Air Conditioning Contractors National Association
SOR – Statement of Requirements
SPD- Surge Protective Device
STC – Sound Transmission Coefficient
STI – Sound Transmission Index
TAB – Testing, adjusting and balancing
TED – Technology Education
THD - Total Harmonic Distortion
TIA – Telecommunications Industry Association

TTMAC – Terrazzo and Tile Manufacturers Association of Canada TVOC – Total Volatile Organic Compounds
ULC - Underwriters' Laboratories of Canada
UPS – Uninterruptible Power Supply
CGBC – Canada Green Building Code
V – Volt
VFD - Variable Frequency Drive
VOC – Volatile Organic Compounds
VoIP – Voice Over Internet Protocol
WAN – Wide Area Network

Part 2 General

2.1 Not in Use

2.2 Standards

2.2.1 The Design-Builder will complete the Design and Construction:

2.2.1.1 in accordance with all applicable Laws;

2.2.1.2 in accordance with the requirements of this Agreement, including this SOR;

2.2.1.3 in accordance with all applicable codes, Standards, specifications and guidelines published by relevant standards organizations;

2.2.1.4 having regard for the concerns, needs and interests of:

(a) the Owner;

(b) all persons who will use the Facility, including the Owner, students, Staff, and other program users; and

(c) governmental authorities, including the City of West Kelowna;

2.2.1.5 in accordance with Good Industry Practice; and

2.2.1.6 to the same standard that an experienced, prudent and knowledgeable long-term owner of a high quality secondary school facility in North America would employ.

2.2.1.7 Sourcing of Materials: The Design-Builder will ensure that all systems, equipment, products, components, Intellectual Property and other materials incorporated into the Facility are sources and procured:

(a) solely through the applicable manufacturer's authorized distribution channels from the Province of British Columbia; or

(b) directly from the applicable manufacturer.

2.3 Use of Wood

2.3.1 The Project will comply with the requirements outlined in the Wood First Act *(British Columbia).*

2.4 Rooms & Spaces

2.4.1 The Design-Builder will design and construct the Facility to include all rooms and spaces as required to comply with the terms of this Agreement, including sufficient rooms and spaces as necessary for the operation and maintenance of the Facility.

2.4.2 If the Design-Builder wishes to propose that the NSM for any room or space, be less than 95% of the required NSM, the Design- Builder must submit a proposed variance to the Owner for review, together with the rationale for the proposed variance and evidence to demonstrate to the Owner's satisfaction that affected rooms retain their functionality.

2.4.3 Area Planning Requirements

2.4.3.1 Calculation of the NSM of all Functional Components and the GSM for the Building will be done in accordance with Ministry of Education BC Area Standards.

2.4.3.2 The GSM total will include all wall areas, circulation areas and supporting service areas required for the Facility to comply to the requirements of this SOR.

2.5 Furniture, Fixtures and Equipment

2.5.1 Provide a list of furniture, fixtures and equipment (FFE) to be included in the Facility which includes 3 categories of FFE: Category A FFE, Category B FFE and Category C FFE. Responsibilities and requirements for each of these categories are described in Appendix 1F.

2.5.1.1 Category A FFE will be Design-Builder supplied and installed in the Facility.

2.5.1.2 Category B FFE will be supplied by the Owner and Design-Builder will install.

2.5.1.3 Category C FFE will be supplied by the Owner and installed in the Facility by the Owner after the Substantial Completion Date.

2.5.2 All systems, equipment, products, components, and other materials incorporated into the Building will be new, unused and of a type and quality intended for use in a permanent building.

2.5.3 Notwithstanding Section 2.4.1 of this Schedule, reclaimed wood may be used with prior approval of the Owner, which approval may be granted or withheld by the Owner at the Owner's discretion.

2.6 Indicative Design

An Indicative Design has been provided.

2.6.1 The Design-Builder may refer to the Indicative Design in the development of the design, but the Owner makes no representation or warranty as to the reliability, accuracy, completeness or correctness of any aspect of the Indicative Design.

2.6.2 The Indicative Design is provided as a reference to demonstrate the functional and operational objectives for the Facility and is not intended to illustrate a singular design solution.

2.6.3 The Design-Builder will be completely responsible for all aspects of the Design and Construction of the Facility whether or not it uses all or any part of the Indicative Design.

2.6.4 The Design-Builder will independently verify the reliability, accuracy, completeness and correctness of any information contained in, or inferred from the Indicative Design if the Design-Builder uses any such information in the Design.

2.7 Design Overview

2.7.1 The Project, named George Pringle Secondary School, is located at 3770 Elliott Road, in the City of West Kelowna, BC. The scope is to construct a Facility that will include:

2.7.1.1 a non-combustible School
2.7.1.2 an area of 11,900m2

2.7.1.3 a student capacity of 1200, grades 9-12

2.7.1.4 an Indigenous space

2.7.1.5 greenhouse gas reduction strategies

2.7.1.6 two outdoor fields

2.7.1.7 a separate childcare Building.

2.7.1.8 site work

2.7.1.9 maintaining an Existing Gymnasium

2.8 Occupancy Capacity

2.8.1 Design the Building to have the following occupancy capacity at Substantial Completion, except where otherwise required by applicable Laws or Standards:

Occupant Type	Count
Students	1200
School Staff	140
NLC Staff	15
NLC Users	60
Total	1415

Part 3 Education Delivery Principles

3.1.1 The Design-Builder will design the Facility to enable the Owner to deliver its educational programs around the following principles:

3.1.1.1 21st Century Learning.

3.1.1.2 Ecology and the Environment: spaces will support a science curriculum which provides better representation of ecology and environmental learning through flexible laboratory, classroom and outdoor learning spaces.

3.1.1.3 Indigenous Perspectives and Knowledge: spaces will support place-based learning with an emphasis on Indigenous perspectives and ways of knowing.

3.1.1.4 Flexible Learning Environments: spaces will provide teachers with greater flexibility in creating learning environments that are relevant, engaging, and novel. Flexible learning environments consider local context and place-based learning.

Part 4 Project Principles

4.1 Design Values and Vision

4.1.1 The Design-Builder will design and construct the Facility to have a form and character that:

4.1.1.1 is an expression of forward-thinking education and architecture executed with a dynamic, elegant, west coast contemporary aesthetic; and

4.1.1.2 respects the influence of the Indigenous culture of the community and recognizes the unceded traditional territory of the West Bank First Nation on which it is located.

4.1.2 The Facility will be designed around an open centralized concept that visually connects the school community.

4.1.3 The Facility will be by its nature a high-performance teaching tool, showcasing innovation and sustainability.

4.2 Design Objectives

4.2.1 Without limiting any other requirement of this Agreement, the Design-Builder will design and construct the Facility to:

4.2.1.1 support education delivery principles outlined in Part 3 of this SOR.

4.2.1.2 provide a safe, comfortable and secure interior and exterior environment.

4.3 Operational Sustainability and Integration

4.3.1 Design and construct the Building to achieve a minimum Design Life of 50 years, from Substantial Completion. Individual components and systems of the Building will have a Design Life which at minimum is consistent with Good Industry Practice or such period as may be expressly specified in Table 4.4 of this Schedule. The performance, including thermal performance, of the Building systems will be designed to be sustainable throughout the Building lifespan Design Life will include operational function and integrity of all systems and equipment.

Table 4.4

Component	Minimum Design Life (years)
Fan Coils	15
Boilers	25
Fans	
Centrifugal	25
Ventilating Roof-Mounted	20

Dedicated Heat Recovery Chiller	20
Hardscape Finishes	20
Pumps	20
Air Handling Units	20
Energy Recovery Ventilators	20
Sawdust Collector	20
Domestic Water Heater	
Air Terminals	27
Ductwork	30
Dampers	20
Coils	20
Insulation (Blanket)	24
Insulation (Molded)	20
Domestic Hot Water Heater (Condensing Gas)	10
Domestic Hot Water Heater (Electric)	10
Pumps	20
Geoexchange Ground Heat Exchanger (GHX)	50

4.3.2 Demonstration and Training

4.3.2.1 Program structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual specification sections.

4.3.2.2 Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following; as applicable:

(a) Basis of system design, operational requirements, and criteria:

(i) System, subsystem, and equipment descriptions.

(ii) Performance and design.

(iii) Operating standards.

(iv) Regulatory requirements.

(v) Equipment function.

(vi) Operating characteristics.

(vii) Limiting conditions.

(viii) Performance curves.

(b) Documentation:

(i) Emergency manuals.

(ii) Operations manuals.

(iii) Maintenance manuals.

(iv) Project record documents.

(v) Identification systems.

(vi) Warranties and bonds.

(vii) Maintenance service agreements and similar continuing commitments.

(c) Emergencies.

(i) Instructions on meaning of warnings, trouble indications, and error messages.

(ii) Instructions on stopping.

(iii) Shutdown instructions for each type of emergency.

(iv) Operating instructions for conditions outside of normal operating limits.

(v) Sequences for electric or electronic systems.

(vi) Special operating instructions and procedures.

(d) Operations:

(i) Startup procedures.

(ii) Equipment or system break-in procedures.

(iii) Routine and normal operating instructions.

(iv) Regulation and control procedures.

(v) Control sequences.

(vi) Safety procedures.

(vii) Instructions on stopping.

(viii) Normal shutdown instructions.

(ix) Operating procedures for emergencies.

(x) Operating procedures for system, subsystem, or equipment failure.

(xi) Seasonal and weekend operating instructions.

(xii) Required sequences for electric or electronic systems.

(xiii) Special operating instructions and procedures.

(e) Adjustments:

(i) Alignments.

(ii) Checking adjustments.

(iii) Noise and vibration adjustments.

(iv) Economy and efficiency adjustments.

(f) Troubleshooting:

(i) Diagnostic instructions.

(ii) Test and inspection procedures.

(g) Maintenance:

(i) Inspection procedures.

(ii) Types of cleaning agents to be used and methods of cleaning.

(iii) List of cleaning agents and methods of cleaning detrimental to product.

(iv) Procedures for routine cleaning

(v) Procedures for preventive maintenance.

(vi) Procedures for routine maintenance.

(vii) Instruction on use of special tools.

(h) Repair:

(i) Diagnosis instructions.

(ii) Repair instructions.

(iii) Disassembly; component removal, repair, and replacement; and reassembly instructions.

(iv) Instructions for identifying parts and components.

(v) Review of spare parts needed for operation and maintenance.

4.4 Design Sustainability

4.4.1 Passive Design Strategies: GHG Reduction Strategy

4.4.1.1 Utilize passive design principles to guide the design of the Building to optimize Occupant health and comfort and minimize energy use by minimizing reliance on mechanical and electrical systems. Optimize the Building orientation, form and thermal performance of Building elements (including architectural, structural, envelope and passive mechanical) for interaction with the local microclimate.

4.4.1.2 Combine the following passive building design strategies to ensure inherent synergies produce optimal comfort and building energy performance:

(a) Site orientation of the Building:

(i) design the Building facades so that they will take advantage of passive solar heating during colder months and reduce overheating in warmer / hotter months; and

(ii) design the facades of the Building to minimize unwanted heat loss.

(b) Interior Space Planning:

(i) use the Building's orientation and massing to decrease energy use and increase thermal comfort; and

(ii) place Building functions with particular thermal requirements in areas of the Building that can provide those conditions with minimal mechanical intervention.

(c) Passive Heating:

(i) harness solar radiation and capture internal heat gains to add free thermal energy to the Building; and

(ii) provide passive solar heating strategies and a well-insulated envelope to minimize energy losses and harness and store solar gains.

(d) Central Cooling and Heating System Energy Recovery:

(i) All components work year-round to recover all the internal heat before adding heat from storage. Any excess heat that cannot be reused is stored in the buffer tank. Excess heat is stored in the geo-exchange system when buffer tank cannot accept additional heat. Only provide heat for gas fueled appliances when there is no stored heat available from the geo-exchange system.

(e) Passive Cooling:

(i) use passive cooling strategies to prevent the Building from overheating by blocking solar gains and removing internal heat gains.

(f) Natural Light:

(i) reduce the need for artificial electric lighting by distribution of diffused Natural Light throughout the Building's interiors.

4.4.1.3 Landscape

(a) Use mature, native vegetation and landscape features to reduce ambient temperatures, reduce the heat island effect of the Building, protect the Building from sun, wind and precipitation, and reduce solar intensity.

4.4.1.4 Buffer Spaces

(a) Locate Buffer spaces directly along-side the Building perimeter and use buffer spaces to improve Building energy performance by widening the range of outdoor temperatures in which thermal comfort can be maintained in the Building with low mechanical energy consumption.

(b) Integrate occupied buffer spaces as transition spaces to capitalize on the wider thermal comfort range in spaces like corridors and entryways, as opposed to other, more tightly conditioned spaces.

(c) Incorporate a main entry vestibule into the Building design, maintained at wider thermal comfort ranges, to help reduce the mechanical system energy consumption by limiting the loss of heated air during winter and cooled air during summer.

4.4.2 Windows

4.4.2.1 Design windows to achieve the optimal combination of heating, cooling and use of Natural Light in conjunction with security requirements.

4.4.2.2 Provide easily accessible means for window washing and maintenance.

4.4.2.3 Select glazing to maximize daylighting while minimizing SHGC unless this is proven to assist in meeting energy reduction targets.

4.4.2.4 Provide minimum double low-E coated, commercial or institutional quality window units.

4.4.3 Solar Shading

4.4.3.1 Use external shading devices and roof overhangs to intercept, absorb and/or reflect solar radiation before it reaches the exterior glazed surface of the building envelope.

4.4.3.2 Design shading devices to their relevant facade orientation and to be able to provide the appropriate performance to meet both winter heating and summer shading/cooling requirements while maintaining occupant comfort.

4.4.4 Air and Moisture Tightness

4.4.4.1 Use an air- and moisture-tight building envelope to eliminate unwanted air and moisture infiltration.

4.4.4.2 Design the Building to optimize air tightness and minimize air infiltration.

4.4.5 Thermal Bridging

4.4.5.1 Design and detail façade connections, window and door perimeters, roof and corner joints, foundations and walkway/building slabs to minimize thermal bridging.

4.4.5.2 Account for thermal bridges in accordance with the Building Envelope Thermal Bridging Guide (BETBG) workbook and as described in Schedule 8.

Part 5 Facility Principles

5.1 Building Location

5.1.1 The Building location will be within the area of the Site as shown on the Site Plan.

5.1.2 The architectural design will optimize views to nearby mountains and waterways. The Building's main entrance will be visible from the primary site entrance.

5.1.3 Not In Use

5.2 Construction Phasing and Demolition

5.2.1 Existing Services

5.2.1.1 During construction, that the site has free and clear emergency access and egress, access to 16 parking stalls at all times and has a pedestrian pathway to the front door at all times.

5.2.1.2 The scope of work for the project includes the landscaping around the Existing Gymnasium, including irrigation, grass, access and egress paths to the front door, emergency exiting paths from the side doors and emergency vehicle access and egress.

5.2.1.3 The scope of work describes connectivity and integration of the Existing Gymnasium with the overall Site and new School.

5.2.1.4 Locate all existing utilities and service lines and protect from damage during Construction.

5.2.1.5 All temporary services will be removed/decommissioned, and the Design Builder will provide permanent services to the Existing Gymnasium as

required by the City and utilities.

5.2.1.6 Surfaces that are disturbed outside of the Site are made good to maintain a consistent finished surface or product.

5.2.1.7 When encountered, cap off inactive services at property line using methods approved or as required by Authorities Having Jurisdiction. Remove inactive service lines, and stake and record location of the capped service.

5.2.1.8 Service tie-ins must be performed during times acceptable to the Owner and by Authorities Having Jurisdiction.

5.2.1.9 Record locations of all new, existing, relocated and removed service lines.

5.2.2 Existing Gymnasium

5.2.2.1 The Existing Gymnasium is required to remain fully functional and ready for continuous use by the Owner from the Effective Date through Total Completion. It is a stand-alone building that has temporary services connected to it, including fire alarm, gas, power, water, sanitary, phone, PA connection, intrusion, LAN.

5.2.2.2 The Design Builder will ensure that a minimum of 16 parking stalls will be provided within a maximum of 70 m of the Existing Gymnasium entrance. A minimum of 26 stalls of the overall project requirement will be designated for and near the Existing Gymnasium in the final design.

5.2.2.3 The Design Builder will ensure that the design will provide connectivity between the Existing Gymnasium and the new School.

(a) Concrete surfaced path minimum 2400mm wide connecting the access points between the main door of the Existing Gymnasium and an Entry door to a corridor of the School building will be provided.

(b) Accessible access will be provided to the Existing Gymnasium.

5.2.2.4 The Design builder will provide landscaping, parking, access, egress and permanent services for the Existing Gymnasium including access for a delivery truck and emergency services.

5.2.2.5 Replace existing irrigation system remaining on the Site.

5.2.2.6 Remove all retaining rock walls on the property.

5.2.2.7 Remove remaining asphalt and hard surfaces on site with new.

5.2.2.8 Paint/finish the Existing Gymnasium to match the School and make good any finishes of the exterior of the existing gym including doors, outside face and edges, jambs, block, metal panel/flashings, exposed conduit that have been damaged due to the renovation process.

5.2.2.9 Replace George Pringle Elementary sign with George Pringle Secondary sign.

5.2.3 Childcare

5.2.3.1 The childcare building will be a separate Building with all services to connect

to the School.

5.2.3.2 Indoor Requirements

(a) Indoor requirements to meet the childcare licensing requirements for the location.

(i) The requirement is for 2 spaces, one for each age cohort (0-36 months and 3-5 years of age). Design-Builder is to follow the Child Care Licensing Regulation (https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/332_2007).

(ii) Office, washrooms (minimum one accessible), laundry, storage room, copy area, additional sink, millwork storage cubby for children.

5.2.3.3 Outdoor Requirements

(a) Outdoor requirements to meet the childcare licensing requirements for the location, including play space areas, shade, parking, access and egress.

(b) Play space to be placed with visual connection from the childcare building for supervision.

(c) Age groups are 0 – 5 years

(d) Play space area to be minimum 6m2 per child.

(e) Provide fully accessible playground, which at a minimum will have:

(i) Age-appropriate play structure, 2 sensory items, 2 interactive pieces, balancing beams, rocks, climbing apparatus.

(ii) 1200mm wide bike path within the fenced play area

(iii) Rubber play safety surface

(iv) Two benches, one waste receptacle

(v) 1600mm chain link fencing, galvanized or vinyl.

(vi) Two access gates. Must have a double acting swing complete with Butter Fly latch hardware system.

(vii) Landscaping, planting, trees and grass, with irrigation.

5.3 Access

5.3.1 Building Access

5.3.1.1 The main School and NLC Entries will be intuitive and welcoming for faculty, Staff, students and the public.

5.3.1.2 Not in Use

5.3.1.3 Not in Use

5.3.1.4 Locate and configure main access points to the School to provide Direct Visual Connection to the Administration department.

5.3.1.5 Open space at Building entrances will be legible, identifiable, and relate to pedestrian and/or vehicular routes as applicable.

5.3.1.6 Open space design at entrances will convey the interior programming and intended users permitted in the Building.

5.3.1.7 Entries will be weather protected by canopies or building overhangs.

5.3.1.8 Interior and exterior finishes will complement one another, unifying the transition between exterior space and the built environment:

(a) entrance vestibules will be provided at each public entrance to the School.

(b) entrance vestibules will have full transparency from the exterior and from the interior immediately in front of the vestibule.

(c) entrance vestibules will be configured and sized to preserve the airlock effect for climate control.

5.3.1.9 There are 4 after-hour uses that require access independent from academic spaces.

(a) Drama Room, & ancillary spaces.

(b) Gymnasium Activity Space & Gym Ancillary Space.

(c) Multi-Purpose Room, Learning Stairs and Learning Commons (Library) while restricting access to the main facility.

(d) Indigenous and Indigenous Support rooms.

These spaces may share access points but require independent access control. These spaces must have access to the required amount of washrooms for the space when used independently.

5.3.1.10 Spaces for after hours access use will be secured by lockable doors and/or security screens, all of which must allow for emergency exiting.

5.3.1.11 Where air handling equipment is located on the roof, it must be provided with direct access via a stairwell or at the floor level outside of a stairwell where such access is level and walkable. Provide 450mm wide concrete pavers from the stairwell to and surrounding any rooftop equipment. Access by an exterior stairwell from an adjacent roof level that has acceptable access is also permitted."

5.3.2 Parking, Loading and Vehicular Traffic

5.3.2.1 Provide pedestrian and vehicular Site access as follows:

(a) Site access will prioritize pedestrian access.

(b) Crosswalks will be located no less than 5m from corners or Site entrances.

(c) Design traffic circulation systems to minimize potential traffic conflicts at heavy traffic periods and to minimize traffic/pedestrian conflicts, both on and off Site.

(d) Include a dedicated pick-up/drop-off for seven 80-passenger school buses in an end to end configuration associated with the primary Site access and drop-off lane immediately in front of the school.

(e) Bus drop off area will be provided with a painted red line on the curb to the loading side and a painted red line between the designed bus drop off zone and the adjacent drive-thru traffic area. The painted line will continue the full length of the bus drop off, separating the bus drop off from the drive aisle while allowing for safe turning radii.

(f) Bus drop off from the front of furthest bus will be no more than 100m from midpoint of the main entry of the school and will not require students to cross lanes of traffic.

(g) Bus drop off aisle will be no less than 3.66 metres wide, allowing for 10.36 metres length per bus.

(h) Provide smooth, level and accessible pedestrian paths a minimum of 2.1 metres in width, adjacent to vehicle passenger drop-offs, to connect to the entry plaza.

(i) Provide smooth, level and accessible pedestrian paths a minimum of 3 metres in width adjacent to the bus drop off.

(j) Clearly define the vehicular access points and drop-off zones to ensure safety and security of the students and users of the Site.

(k) Separate the long-term parking from the drop-off area to ensure the traffic flows smoothly.

(l) Provide pathways per the AHJ.

5.3.2.2 Parking

(a) General Requirements

(i) Vehicular and pedestrian routes will be clearly identifiable, intuitive and welcoming when arriving to, leaving from, and within parking.

(ii) Avoid a monolithic impervious surface. Create smaller lots that minimize impervious surface and maximize stormwater infiltration.

(iii) Provide measures that create safe and secure pedestrian access to, from, and within parking areas at all times of the

day or night.

(iv) Parking zones will be designated as for the Neighborhood Learning Centre, School and emergency vehicles.

(v) Alternative Forms of Transport

See 8.7.26 for electric vehicle charging stations.

(vi) Provide a minimum of 272 parking spaces distributed as follows:

1. Staff/faculty parking spaces accessed from the primary Site entrance near the entrance to the School.

2. Additional to 5.3.2.2.(a).(vi), Technology Education (TED) Compound to have up to 10 parking stalls, limited by the access requirements for the minimum waste truck turnaround.

(vii) Provide a minimum of 4 spaces of hard-surfaced parking for the Neighborhood Learning Centre.

(viii) Provide 4 Accessible spaces, 4 loading spaces, 7 full size bus drop-off spaces and 15 car drop-off spaces. Accessible spaces provided will be located nearest to Building entries and will be provided with a 2.1m minimum sidewalk access without crossing roadways.

(ix) Provide secure bicycle parking spaces in a 2m high chain link fenced area with locked gate access to accommodate a minimum 20 bicycles:

1. secure bicycle parking will be located 10-50 metres from the main Building entrance.

2. 25% of secure bicycle parking spaces will be weather protected the area provided for bicycle parking is in addition to the required NSM area of the School's entry.

(x) Provide a concrete pad to accommodate a 7.4m x 2.4m x 3m school bus located in a less prominent location. Allow for the addition of future chain link fencing to secure and provide visual screening.

(xi) Provide a concrete pad in a location suitable for post-disaster gathering area to accommodate a 6.1m x 2.4m shipping container for earthquake supplies.

5.4 Building Servicing

5.4.1 Locate equipment, fixtures and distribution systems to provide:

(a) convenient access for intended use.

(b) convenient access for ongoing maintenance.

(c) safe clearances around equipment, fixtures and distribution systems.

(d) flexibility for future changes; and

(e) minimum interference with functionality of spaces.

5.4.2 Concealment & Fitting

5.4.2.1 Conceal pipes, ducts and wiring in wall, floor and ceiling construction of finished areas using covering material consistent with room finishes. In finished spaces with exposed structure where services cannot be routed outside of the exposed space or otherwise concealed in a consistent manner, minimize exposure of services and finish in an architecturally appropriate and consistent manner with the finishes of the room. In service spaces that are not normally visible to the users of the building, concealment of necessary servicing is not required.

5.4.2.2 Perform cutting, fitting and patching to make work fit neatly, cleanly and tightly together.

5.5 Movement Control

5.5.1 The circulation model for the Building will:

5.5.1.1 utilize each stairwell as open for circulation use.

5.5.1.2 exterior doors at stairwells will be exit-only.

5.5.1.3 clearly identify areas that are restricted.

5.5.1.4 minimize the need for wayfinding signage.

5.5.1.5 minimize the number of control points (doors); and

5.5.1.6 provide a minimum of one elevator.

5.6 Landscaping Design Principles

5.6.1 Landscape Design Criteria

5.6.1.1 General Requirements

(a) The landscape design will comply with the Standards set out in the current Canadian Landscape Standard, except where modified by the requirements of this Statement of Requirements.

(b) The irrigation system design will meet or exceed standards set out in the current IIABC Standards for Landscape Irrigation Systems, except where modified by the requirements of this Statement of Requirements.

(c) The landscape and Site design will be completed by qualified personnel:

(i) Preparation of the landscape design, construction documents and provision of field services during construction will be completed by a Landscape Architect registered in B.C. The Design-Builder will cause the BC Registered Landscape Architect to sign and seal all landscape construction documents and Landscape Schedules.

(ii) The irrigation design will be completed by an IIABC Certified Commercial Designer.

(d) Perform the landscape design and implementation to avoid any negative impacts on local waterways.

(e) Plant selections will be made with safe removal of discarded sharps in mind. Groundcovers and single or multi-stemmed plants that cannot be pruned to allow visibility below foliage are not to be used.

(f) The landscape will be designed so that activity areas align with maintenance level standards outlined in the Canadian Landscape Standard as follows: main entrances and plaza areas will be 'Level 2 Groomed'; stormwater management areas will be 'Level 5 Background & Natural Areas'; all other areas will be 'Level 3 Moderate'.

(g) New planting will not include:

(i) Platanus x acerifolia (London plane);

(ii) Aesculus hippocastanum (common horsechestnut);

(iii) Aesculus x carnea (red horsechestnut);

(iv) Populus balsamifera & P. sp. (cottonwood and other poplars);

(v) Salix sp. (willow);

(vi) fruit bearing fruit trees;

(vii) bedding/seasonal plantings; or

(viii) groundcovers.

(h) The landscape design will include a minimum of 12 benches or 36m of seating walls placed throughout the Site. Exact locations and types will be determined in the user consultation process.

(i) There will be no vegetation located below the building overhangs and no grass areas located immediately adjacent to boulders. Grass will be located where there will be no or minimal need to trim around objects.

5.6.1.2 Tree Retention, Protection and Removal

(a) All trees protected under Municipal Tree Preservation /Protection

Bylaws will be retained, protected against construction related damage, and maintained throughout Site preparation and Construction.

(b) Tree protection zones will be enclosed with fencing including a solid wood frame and orange snow fencing or metal fencing. Signage noting 'Tree Protection Zone' will be posted on the above noted fencing.

(c) Work that may affect the health of retained trees within tree protection zone shall be overseen, where typically required, by an ISA Certified Arborist. The tree protection zone will be identified in the Project Management Plan.

5.6.2 Landscape Construction Criteria

5.6.2.1 General

(a) All plants will be nursery grown and comply with the requirements of the current Canadian Nursery Landscape Association (CNLA) Canadian Standards for Nursery Stock, except where modified by this Statement of Requirements.

(b) Landscape construction will be completed by qualified personnel:

(i) The irrigation installation will be completed by an IIABC Certified Irrigation Technician, and the irrigation contractor will be a member in good standing of the Irrigation Industry Association of BC and have met the qualification standards currently applied to contractors by that organization.

(ii) All pruning will be completed by an ISA Certified Arborist or by a professional gardener trained in arboriculture or horticulture.

5.6.2.2 Topsoil, Compost and Mulch

(a) Growing medium will be Loamy Sand to Sandy Loam, as per the Canadian System of Soil Classification, for all areas except stormwater management areas.

(b) Growing medium in stormwater management areas will be Sandy Loam to Loam, as per the Canadian System of Soil Classification.

(c) Mulch will be used to reduce invasive and noxious plant growth, improve water retention in soil and improve the appearance of planting beds.

(d) Mulch will be organic. Plastic film, woven or non-woven fabrics and stone mulch is not acceptable. Mulches such as vegetative compost or leaf mulch will be used.

(e) Do not use bark mulch and/or shredded bark mulch.

5.6.2.3 Plants and Planting

(a) Minimum sizes of new freestanding trees and shrubs will be as follows:

(i) Coniferous trees – 2m height and 4cm caliper; # 15 pot.

(ii) Deciduous trees – 3.75m height and 6.5cm caliper; wire basket.

(iii) Ornamental trees– 2.75m height and 4cm caliper; #15 pot.

(iv) Evergreen shrubs – minimum #5 pot; container grown.

(v) Deciduous shrubs – minimum #2 pot; container grown.

(vi) Herbaceous plants - minimum #1 pot with the following exception: rapidly growing plants may be planted as SP#4 if planted in spring and before the end of May. Plugs are not acceptable.

(vii) Live stakes and bulbs are acceptable if the bulbs and stakes are of non-invasive and drought tolerant species.

(b) All plants are to be guaranteed for the Warranty Period. The Design-Builder will replant any trees that, within the Warranty Period, are visibly dying, dead, leaning or have root balls where the root flare is not visible.

(c) Planting will be drought tolerant.

5.6.2.4 Sod Lawns, Multi-Purpose Fields, and Seeding

(a) There are two multipurpose fields, one large and one small playing field. They will have drainage suitable for year-round use.

(i) First field to accommodate:

1. Soccer Field Dimensions: Width 70 yards (min) x Length 120 Yards.
2. High School Football: Width 55 Yards x Length 120 Yards Long
3. Add minimum 3.0m safety zones around field (4.0m adjacent to roadways) and 5.5m end zones.

(ii) Second field to be minimum of Width 55 yards x Length 80 yards.

(b) There will be a minimum of 5.5 metres of sod perimeter between the Multi-Purpose Field and trees, planters and other landscape areas.

(c) The Multi-Purpose Field and all grass areas with significant sun exposure will be surfaced with large roll turf sod. Example: ‘Sport Turf’ sod supplied by Anderson Sod Farm.

(d) All other grass areas will be seeded as follows:

(i) Microclover/Low Maintenance & Wildflower Mix under Gary

Oak Trees. Example supplier: Premier Pacific Seeds Ltd;

(ii) All Purpose Sun & Shade with Microclover Mix in bioretention areas. Example supplier: Premier Pacific Seeds Ltd; and

(iii) Envirolawn Mix in remaining grass areas on Site (must be shade tolerant for shady areas). Any grass areas in shade will be seeded with shade tolerant seed mix. Shaded grass areas will be kept to a minimum. Example supplier: Premier Pacific Seeds Ltd.

(iv) Custom grass seed blends for specialty areas are acceptable. The seed mix must be composed of drought tolerant, non-invasive, native and adaptive species.

(e) Sod will be un-netted and soil based. Soil base will match, as much as possible, soil conditions of Site.

(f) Turfgrass sod will be Nursery (Cultivated) Turfgrass Sod No. 1 Premium grade in all areas designed for Level 2 'Groomed' maintenance, and No. 3 Commercial grade in all areas designed for Level 3 'Moderate' maintenance. Stormwater management areas will be sodded with No. 3 Commercial grade sod or seeded. Maintenance levels will be as outlined in the Canadian Landscape Standard and indicated in this document.

(g) The Multi-Purpose field will include:

(i) an underground drainage system consisting of an array of 100mm diameter perforated pipes with granular surround at minimum 6m offset;

(ii) pipes discharged into a suitable drainage system;

(iii) pipes with minimum 450mm cover and will not to conflict with the irrigation system;

(iv) a minimum 1% crown or cross fall on the field surface level and field subgrade; and

(v) field drainage design and installation to follow best practices for community and secondary school sports fields

(h) If any portion of the site is to be naturalized using hydraulic or mechanical seed, the proposed seed mix is to be submitted for review. Design Builder to ensure establishment by watering or temporary irrigation. Seeded areas will be considered complete if the cover is growing vigorously at a height of 20mm or greater. Establishment may be relaxed under evergreen tree canopy.

5.6.2.5 Irrigation

(a) Provide an automatic High Efficiency (HE) irrigation system that achieves 100% coverage for the Multi-Purpose Field. The system will include a rain shut-off device and an exterior controller with a 365-day calendar.

(b) System components will be as follows, or equivalent as approved by the Owner:

(i) Heads: RainBird 8004 sprinklers with #12 or #14 nozzles at 50 square foot spacing, except where a smaller rotor is required, in which case RainBird 3500 heads will be used;

(ii) Valves: Rainbird;

(iii) Device Server: IQ Advanced Software;

(iv) Modem: IQ Ethernet comm Card;

(v) Cable: 25 pin to 9 pin;

(vi) Antenna: IQ Ethernet Antenna ;

(vii) Antenna: 'Lo Pro';

(viii) Industrial Flow Sensor: PV228-Size Data sized to fit mainline; and

(ix) Brass Master Valve: EFB-CP 1"-2" or BPES 3".

(c) The irrigation sprinkler system controller will be mounted on the Building exterior in a pad-lockable SS box at a location approved by the Owner, and providing maximum visibility of the Multi-Purpose Field and grounds.

(d) Tree pits will be provided with drip irrigation loops. Drip irrigation will be zoned separately.

(e) All pressurized lines will be copper, cross-linked polyethylene (PEX) or CSA approved Schedule 40 PVC pipe.

(f) All lateral lines will be SDR-21 PVC pipe (aka Class 200 PVC Pipe).

(g) Sleeves are required under all paved surfaces.

(h) All sprinklers will be installed on swing joints. One inch (1") swing joint will be an 'O' ring for the 640 heads. All other swing joints will be manufactured.

(i) All turf valves will be installed on swing joints using brass street elbows and brass nipples.

(j) All valves will be grouped in lockable steel boxes or vaults, that allow sufficient access to effect repairs and maintenance. Vaults are required for all Multi-Purpose Field valves. Vaults or boxes for all other grass areas.

will be located near water source and in low traffic lawn areas, not by doorways or gates.

(k) Sprinklers and turf valves will be flush mounted at finish grade.

(l) Valves will be in securable vaults which are flush with finish grade and parallel to the nearest wall or sidewalk, whichever is closer.

(m) Provide one complete 'blow down' (winterization) and one spring start-up after installation.

Part 6 Building Design Principles

6.1 Building Requirements

6.1.1 The Design-Builder will design the Building to reflect the school's hybrid organizational structure which combines Learning Communities with flexible learning environment components which can support a departmental approach for specialized curricular components if desired.

6.1.2 The Design-Builder will design the Building to allow students to see into various areas of interest.

6.1.3 The Design-Builder will design the Building to provide for collaborative, social learning through design of informal student social spaces, in various locations and configurations. Requirements for such spaces are as follows:

6.1.3.1 use spaces adjacent to exterior glazing in circulation spaces and areas overlooking the Multi-purpose Space.

6.1.3.2 provide five Learning Communities of four classrooms, support spaces and Inclusive Education rooms each, to support the education of 100 students per Learning Community.

6.1.3.3 provide student social spaces for small group and independent study**.**

6.1.3.4 provide opportunities for outdoor learning areas at grade and/or upper floor levels. No outdoor learning areas to be located on the roof and;

6.1.3.5 provide a seating space as a Gathering Stair for group learning, workshops, performances, special presentations and socialization.

6.1.4 Calculate student washroom requirements and distribute proportionally for each floor.

6.1.5 Provide a single GN washroom within each Learning Community for student use, as part of the total washroom fixture requirement.

6.1.6 Allow for visual supervision of all common areas through horizontal and vertical visual connections between circulation spaces, avoiding non-visible spaces and long, aligned, non-articulated corridors. Minimum requirements are as follows:

6.1.6.1 Provide Direct Visual Connections between all levels of the entry Lobby and Multi-Purpose Space.

6.1.7 Allow for visual connections within the School between spaces occupied by students and adjacent occupied learning areas to provide opportunities for supervision and exposure to new activities and ideas.

6.2 Architectural Design Principles

6.2.1 The following architectural design principles have been established for the Project:

6.2.1.1 The Building will provide an environment suitable to celebrate activities and accomplishments.

6.2.1.2 The Building will optimize Natural Light and views in the regularly occupied interior spaces. Implement strategies to deliver Natural Light deeply into spaces and provide effective ties between the interior and the exterior while balancing heat loss, solar gain and glare.

6.2.2 Building Entrances and Exits

(a) The main School entry will be easily identifiable and provide a welcoming impression with views through to the Building interior.

(b) The main School entry will be universally accessible.

(c) All Building entrances and exits will be legible, identifiable, and relate to pedestrian and vehicular routes, as applicable.

(d) Where steps are used to access entrances or exits, accessible ramps will be provided adjacent to the stair.

(e) No access ramps or grades will be greater than 1:20, with the exception of the accessible ramp between each of the two below connections:

i) the lower parking area to the Existing Gymnasium entrance, and

ii) the connection of the lower parking area to the entry to the school

(f) All Building entrances and exits will be weather protected.

6.3 Structural Engineering Principles

6.3.1 Buildings will be designed in accordance with the BCBC. Building material and construction will comply with all applicable standards of the Canadian Standards Association (CSA).

6.3.2 Structural Design Responsibility

6.3.2.1 The Design-Builder will retain:

(a) A Structural Engineer of Record (SER) who will:

(i) be a Professional Engineer, specializing in structural engineering.

(ii) perform the duties of engineer of record, responsible for the structural design of all structural elements and connections to the structures.

(iii) review all work by the specialty structural engineers and supporting registered professionals and certify that the design meets the requirements of this Contract and this SOR.

(iv) coordinate structural and geotechnical criteria required for foundation design and ground improvements as required.

(b) Any specialty structural engineers or supporting registered professionals who may be used for the design of components and connections will be directed by the SER. Designs by the specialty structural engineers or supporting registered professionals will be signed and sealed by the specialty structural engineers or supporting registered professionals registered in the Province of British Columbia.

6.3.3 Design Loads

(a) Design loads and load combinations are to comply with the BCBC.

(b) The importance category of all buildings is to be a minimum of High Importance.

6.3.4 Reinforced Concrete

6.3.4.1 Design Requirements

(a) Design and construct reinforced concrete structures including foundations to resist stresses produced by load combinations in accordance with BCBC and CSA Standards A23.1, A23.2 and A23.3.

(b) Concrete will use Portland-Limestone (GUL) Cements in accordance to CSA A3001.

6.3.5 Structural Steel

6.3.5.1 Strength Limits

(a) Design and construct all building structural steel structures to resist stresses produced by load combinations in accordance with BCBC and CSA Standards S16.

6.3.5.2 Vibration Limits

(a) Design and construct all building structural steel structures in accordance to vibration limits as per BCBC.

(b) Composite concrete and steel deck floors are not to be used for polished concrete floor finishes

6.3.6 Substructure

6.3.6.1 Foundations

(a) Design and construct all foundations to resist stresses produced by load combinations in accordance with BCBC and geotechnical recommendations.

6.3.6.2 Sub Grade Enclosures

(a) Sub grade enclosures for mechanical and electrical services and equipment will resist floor and traffic loading in accordance with BCBC Table 4.1.5.3 and 4.1.5.9.

(b) Design lateral soil pressure in accordance with geotechnical recommendations.

6.3.6.3 Slab on Grade

(a) Design slab on grade to resist uniform and point floor loading in accordance with BCBC.

6.3.6.4 Water and Gas Mitigation

(a) Provide dewatering and gas mitigation if required.

6.3.6.5 Substructure Related Activities

(a) The Design-Builder will retain a geotechnical engineer registered in BC for the purpose of geotechnical design of the selected foundation solution, in conjunction with the SER. The geotechnical engineer will review and approve implementation of their designed prior to installation of structural foundations.

(b) Excavation slopes will comply with the geotechnical recommendations prepared by the Design-Builder's geotechnical engineer and Occupational Health and Safety Regulations requirements.

6.4 Mechanical Engineering Principles

6.4.1 Engineering Design Principles & General Requirements

6.4.1.1 Provide mechanical systems to serve the Facility that are designed to meet all programmatic requirements while considering long term maintenance impact, equipment longevity and life cycle, energy efficiency, occupant comfort, and system response time.

6.4.1.2 Provide mechanical systems that respond to the needs of programmed space requirements described in Section 7 and Appendix 1B - Room Data Sheets, including the specialized mechanical systems which will be needed in various spaces to meet these needs.

6.4.1.3 All mechanical equipment will be installed in areas only accessible by maintenance staff. Where equipment is installed in public areas, such equipment shall be inaccessible to the public and located within the ceiling or in lockable cabinets.

6.4.1.4 Mechanical

(a) Mechanical and mechanical systems include fire suppression/protection, plumbing systems, HVAC systems and controls, including specialty systems within these disciplines.

(b) Mechanical and plumbing equipment will be configured and located in such a way that maintenance and repair can be performed without entering any classrooms, except for minor equipment such as plumbing fixtures that serve a particular classroom. If this equipment cannot be located elsewhere, then it is permitted to be located within the classroom it serves. Equipment that generates noise or other distractions such fans, terminal equipment, or other equipment with rotating components must not be located in classrooms, office spaces, or any other areas that would be considered objectionable.

(c) The mechanical, plumbing and fire protection systems will be designed to ensure continual operation at levels required by this SOR. Standby capacity and redundancy will be included in system design as required by Part 8 Facilities Services of this SOR.

(d) The mechanical systems will be designed to provide a comfortable and productive environment for the Occupants and provide the environmental and infrastructure needs of all equipment.

(e) The mechanical systems will be designed to minimize impact on the natural and physical environment and greenhouse gas emissions through energy efficiency, optimization of resource use, and simplification of the systems.

(f) The mechanical systems will be designed and located to be hidden or blend into the overall Building. The design and location of equipment will mitigate noise.

(g) Not in use.

(h) Mechanical systems will be designed to facilitate equipment maintenance and replacement. Design submittals, indicate how equipment replacement can occur (access etc.). For example, Design shall facilitate replacement of all major and larger equipment. shop lifts, appliances etc.. Easy access will be provided and shown on drawings for moving the new equipment in and out of the mechanical rooms and energy plant without disruption to Facility operations.

(i) Water, glycol and all other fluids used within mechanical systems will be treated to prevent corrosion, algae growth, buildup of deposits, disease, bacteria and to prolong the equipment life.

(j) The mechanical design will incorporate the following levels of

redundancy:

George Pringle Secondary School			
Redundancy Schedule			
Mechanical Equipment Type	Application	Required Level of Redundancy	Notes
Dedicated Heat Recovery Chiller	Primary Heating/Cooling System	No Redundancy	
Boiler	Primary Heating System	See Note	The boiler array shall meet the design heating load including full skin losses and ventilation load with the Dedicated Heat Recovery Chiller out of service as well as the ventilation system functioning fully but with 50% of the heat recovery capacity inoperable. The number of boilers shall be selected such that if one boiler is inoperable, then the remaining boilers will satisfy a minimum of 75% of the design load described above.
Pump	Cooling Primary Circulation	No Redundancy	
Pump	Cooling Secondary Circulation	No Redundancy	
Pump	Heating Primary Circulation	No Redundancy	
Pump	Heating Secondary Circulation	N+1	N=Heating Terminal Equipment demand.
Pump	Geoexchange Circulation	N+1	N=Geoexchange Flow to meet performance requirements.
Pump	Heating Coil Recirc Pump	No Redundancy	The system must be designed to detect a failed coil recirculation pump and fail-safe such that opening the coil's control valve will still direct heating water through the coil even with the pump inoperable.
Pump	Domestic Hot Water Recirc	No Redundancy	
Heat Recovery Ventilator	Ventilation	No Redundancy	
Fan Coi	Occupant Comfort	No Redundancy	
Air Handling Unit	Occupant Comfort	No Redundancy	
Split System Fan Coil and Condensing Unit	IT Equipment Cooling	N+1	N=IT equipment demand. Primary cooling will be provided by the chilled water system while backup cooling will be provided by separate direct expansion cooling system.
Split System Fan Coil and Condensing Unit	Occupant Comfort	No Redundancy	
Furnace	Occupant Comfort	No Redundancy	
Low Temperature Forced Air	Space Heating	No Redundancy	
Low Temperature Forced Air	IT and Electrical Equipment Cooling	No Redundancy	
Low Temperature Forced Air	Space Heating and Cooling	No Redundancy	
Radiant Heat	Space Heating	No Redundancy	
Unit Heater	Space Heating	No Redundancy	A minimum of 2 units are required where indicated on Appendix 1B Room Data Sheets.
Exhaust Fan	Ventilation	No Redundancy	No single fan system will serve more than 50% of a the building
Domestic Hot Water Tank	Domestic Hot Water Service	No Redundancy	The number of domestic hot water heating units shall be selected such that if one unit is inoperatble, then the remaining units will provide a minimum of 50% of the design domestic hot water load.
Domestic Hot Water Tank	Science Room Domestic Hot Water Service	No Redundancy	

(i) Not In Use

(ii) Not In Use

(iii) Not In Use

(iv) Not In Use

(v) Not In Use

(vi) Not In Use

(vii) A condensing boiler heating system shall be provided as backup for the geoexchange system. The boilers shall be designed for the same supply and return temperatures.

(k) Provide water, sanitary, storm and gas utilities as required and sized to suit the consumption and discharge needs of the Facility.

(l) Mechanical services in electrical and Communications Rooms shall maintain a clear height of 2.13 metres (7'-0") above the finished floor. Slab penetrations above these rooms shall be equipped with sleeves which terminate 75mm above the slab to prevent water from entering the sleeves. Concrete curbs around mechanical slab penetrations would be acceptable in lieu of sleeve projections."

(m) All pipes, ducts and fittings, vessels and equipment with the exception of piping conveying fluids between 18 °C and 40 °C, shall be insulated to conserve energy, prevent condensation, attenuate noise and prevent accidental burns, All pipes, ducts and fittings, vessels and equipment will be insulated as required by code.

(n) All building services and ductwork will be run inside the Building envelope.

(o) Public, Staff and service entrances will be protected by auxiliary heating.

(p) No "drop in anchors" will be used to support, hang, or brace piping, ductwork, or other equipment.

6.4.2 Service Access Panel Door

6.4.2.1 Supply flush-mounted tamperproof and lockable access panel doors in non-accessible type ceilings and walls where necessary for access to service and/or to inspect mechanical equipment, accessories, and life safety devices.

6.4.2.2 Unless otherwise noted, access doors will be minimum 610mm x 610mm (24" x 24") for body entry; 300mm x 300mm (12" x 12") for hand entry; 200mm x 200m (8" x 8") for cleanout access.

6.4.2.3 Locate access doors so that all concealed items are readily accessible for adjustment, operation, maintenance and inspection.

6.4.2.4 Access doors will not be located within Washrooms and will be in service areas or janitor closets.

6.5 Electrical Engineering Principles

6.5.1 All electrical systems and equipment required for the Facility will be provided and configured in line with the details and indicated in this SOR.

6.5.2 Electrical systems, controls and energy management systems will be designed and constructed to minimize peak electrical demand load, utility demand charges and to

eliminate power factor surcharges.

6.5.3 Provide electrical systems that are proven and are the most recent and up to date at the time of the technical submission, with further specification updates to remain up-to-date throughout the build process where they do not impact the budget.

6.5.4 Unless specifically prohibited, integrate systems where integration provides efficiency, operational advantages and/or cost savings.

6.5.5 Include systems and equipment coordinated to provide synergy and reliable electrical performance for the various functions within the Facility.

6.5.6 Incorporate into the design and construction the principle that change will be a constant and inevitable fact within the Facility. Completed electrical systems will permit change while minimizing the cost of change and the amount of disruption to the regular program activities and functions. Electrical rooms, equipment and systems control panels are to have extra space. Spare capacities allowed for in the main equipment (transformers, generators, UPS, and associated switchboards and panelboards) for future flexibility will be separately identified in the equipment sizing calculations.

6.5.7 Locate electrical rooms, electrical system components and major pathways such that they are as close to the centre of the loads as possible to avoid potential interruption due to future changes, to avoid interferences with other services and equipment, to minimize the distances for feeder runs, and to minimize the cost impact of new requirements.

6.5.8 Electrical and Communications Rooms will not have drain pipes, plumbing pipes, water-cooled fan coil units or other sources of water located in the ceiling space.

6.5.9 Provide provisions to minimize the noise and vibrations of electrical equipment / components such as transformers, luminaires and cables to below acceptable levels which will vary within specific areas. Refer to Section 7.9.10.1 (Acoustic Treatment) of this Schedule.

6.5.10 Electromagnetic interference (EMI) will be mitigated in design, selection and installation of electrical equipment. EMI reduction will be achieved by utilizing by using strategies including: electromagnetic shielding for transformers and switchgear; use of ferrous raceways such as EMT as required by electrical code; close spacing of conductors in feeders; running all the phases of a feeder together to cancel net magnetic fields; and locating all distribution transformers in electrical rooms and running feeders in service and ceiling spaces away from occupied areas. Bus duct is acceptable only when used in electrical rooms or in vertical risers from electrical room to electrical room but must be fully enclosed. Should there be an electromagnetic field that results in interference to equipment, the Design-Builder will mitigate the electromagnetic field with appropriate techniques.

6.5.11 Install electrical systems and equipment in a fixed, seismically restrained and permanent manner. Plan installation of equipment to economically occupy the available space~~,~~ and to facilitate easy access to other systems and equipment, including mechanical equipment, which may require inspection or maintenance.

6.5.12 Power throughout the Facility will comprise of a combination of 347/600V (mechanical equipment, elevator) and 120/208V (power, lighting and auxiliary equipment loads).

6.5.13 Rough-in to accommodate a future photo-voltaic system for the Net-Zero Ready

strategy.

6.5.14 Provide conduit runs from the parking lot to the main electrical room for a future photo-voltaic system. Provide spare area for distribution panels within the main electrical room for a photo-voltaic system expansion. Design-Builder to provide 2.5" or larger conduit from the main electrical room to the landscape area adjacent to the main parking lot for future solar PV. Allowances will be made for a PV system of up to 100KW AC.

6.5.15 Service Access Hatches

6.5.15.1 Supply flush-mounted tamperproof and lockable access panel doors in non-accessible type ceilings and walls where necessary for access to service and/or to inspect electrical equipment, accessories, and life safety devices. Lock hardware will be commercial grade.

6.5.15.2 Unless otherwise noted, access hatches will be minimum 610mm x 610mm (24” x 24”) for body entry; 300mm x 300mm (12” x 12”) for hand entry; 200mm x 200m (8” x 8”) for cleanout access.

6.5.15.3 Locate access hatches so that all concealed items are readily accessible for adjustment, operation, maintenance and inspection. Locate in service, storage and Staff accessible areas only.

6.6 Energy Model Principles

6.6.1 Performance Criteria: See Schedule 8 Energy.

Part 7 Facilities Construction

7.1 Division 3 – Concrete

7.1.1 General Requirements

7.1.1.1 All concrete work will comply to the requirements of CAN/CSA A23.1 and A23.2.

7.1.1.2 Design and construct cast in place and precast concrete of appropriate properties for the intended use in accordance with the requirements of all applicable Codes and Standards for the applicable concrete exposure class and to maximize the fly ash content of the mix. All cast in place concrete will be vibrated or densified in accordance with CSA 23.1 Cl. 9.5.2 by a competent place and finish trades person.

7.1.1.3 Repair Honeycombing and bug holes under the direction and discretion of the Structural Engineer of Record to provide required structural performance, durability and finish.”

7.1.2 Quality Requirements

7.1.2.1 Cast in place concrete and concrete materials will be inspected and tested by a CSA certified testing laboratory.

7.1.2.2 Precast concrete materials and workmanship will be inspected and tested by

the precast concrete trades person as part of the Design-Builder's quality control program.

7.1.2.3 Concrete Building elements that will remain exposed to view from the exterior of the Building will be designed and constructed as architectural concrete, as defined in Section 8.3 of CAN/CSA A23.1.

7.1.2.4 Concrete surfaces, excluding exposed concrete floors not covered with Building finishes, will have a smooth-formed finish, as defined in Section 7.10.2.6. of CAN/CSA A23.1."

7.1.2.5 All Exterior Exposed concrete walls and structure of the Building to have an anti-graffiti coating."

7.1.2.6 Concrete floors will be sealed.

7.1.3 Performance Criteria

7.1.3.1 Finish concrete floors with a smooth, dense, steel trowel finish with a Class A Flatness Classification in accordance with CSA A23.1.

7.1.3.2 Repair cracks in concrete floors and walls to suit the floor finish and long-term serviceability requirements of the floor.

7.1.3.3 Waterproof foundation walls surrounding occupied spaces to prevent groundwater ingress. Construction joints will have purpose-made water stops. A perimeter footing drainage system will be installed around the exterior of the below grade spaces.

7.1.3.4 Slabs on grade will be designed and constructed to perform for intended use without deterioration under heavy loads, heavy traffic, abrasive wear and chemical attack and as a minimum will:

(a) Be reinforced to control cracking.

(b) Be designed for loading for all required Equipment and for a minimum live load of 4.8 kPa.

(c) Where no applied finish is required, be sealed to resist penetration and staining from items such as food products, bodily fluids and cleaning compounds.

7.2 Division 4 – Masonry

7.2.1 General Requirements

7.2.1.1 Masonry wall assemblies will only be installed by installers who are members in good standing with the Canadian Masonry Contractors Association in BC.

7.2.1.2 Masonry construction may be considered for exterior walls, foundation walls, exit stairs, elevator shafts, and walls systems where permanence of finishes, both visually and functionally, and ease of maintenance are primary considerations in the exterior fabric of the building.

7.2.1.3 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.

7.2.1.4 Face work will be laid plumb and true with all joints consistent in both width and colour.

7.2.1.5 Apply manufacturer recommended masonry sealers to all exterior masonry.

7.2.2 Concrete Masonry Units

7.2.2.1 Concrete masonry units will not be visible in any interior spaces, except for Support Spaces.

7.2.2.2 Concrete masonry units are acceptable for both independent exterior walls and in exterior wall systems as a structural backing to other finish materials or systems.

7.2.2.3 Concrete masonry units for interior applications may be considered only as structural backing to other finish systems unless specifically noted otherwise in Appendix 1B – Room Data Sheets.

7.2.2.4 Masonry design and construction will comply with Canadian Masonry Contractors Association (CMCA) Masonry Practices Manual, CSA-S304, and all applicable Standards including CSA-A371.

7.2.2.5 Where concrete masonry units are used at exterior areas, internal cores will be grout filled.

7.2.3 Brick Masonry

7.2.3.1 Exterior wall systems comprising brick masonry as a finish veneer to concrete, concrete masonry or metal framing will be a rain screen or cavity wall system.

7.2.3.2 Brick masonry below grade for exterior applications is not permitted.

7.2.4 Stone Masonry

7.2.4.1 Stone masonry, subject to advance written acceptance by the Owner, may be used as a finish veneer to concrete walls or concrete masonry walls. Exterior wall systems in such applications will be a rain screen or cavity wall system.

7.2.4.2 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 and other mineral and organic defects. Manufactured stone products are permitted if reviewed and accepted in advance by the Owner.

7.3 Division 5 – Metals

7.3.1 Performance Criteria

7.3.1.1 Design structural steel, steel deck, and cold-formed steel stud systems to comply with the deflection and vibration criteria outlined in this section."

7.3.1.2 For steel floor and roof construction, the deflection of steel beams, joists, and

girders due to the wet weight of concrete topping slabs will be accounted for. Topping slab thickness may have to vary to maintain floor levelness tolerances. The additional concrete ponding weight will be accounted for in the design of the building.

7.3.1.3 All concrete topping slabs on steel deck will contain minimum reinforcing to mitigate random surface shrinkage cracking. There will be diagonal reinforcing placed at each reentrant corner and corners of floor openings to help mitigate radial cracking.

7.3.1.4 Curing of concrete topping slabs on metal deck will comply to Section 8.3 of CAN/CSA 23.1. In addition, the following details and procedures will be implemented:

(a) Minimize wet weight deflections of steel decking and supporting structure.

(b) Where practical, place concrete in alternate bays. Avoid placing large areas at one time.

(c) Use concrete topping with a low design slump. Add superplasticizer if necessary to increase slump for placing and finishing; and

(d) Provide extra topping slab reinforcement around openings, columns and at corners.

7.3.1.5 Steel 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.

7.3.1.6 Where roof assemblies requires a fire rating, the Design Builder is to provide an appropriate listed fire rated assembly.

7.3.1.7 Where required for fire rating, appropriate spray-applied fire proofing applications which will be tamped while wet to densify the product will be used for floor and roof beams and girders, complete with an applied sealer creating a dense non-friable surface for ease of future attachment of services and equipment.

7.3.1.8 Design the structure to meet the deflection limits of the BC Building Code, and in accordance with the applicable materials Design standards listed in Section 2.1 of this Schedule as a minimum and as required for the non-structural components of the Facility. Notwithstanding the above, the deflection limit will not exceed the levels specified in this Section.

7.3.1.9 Performance Requirements

(a) For concrete floor or roof construction, the maximum deflection occurring after the installation of non-structural elements due to all sustained loads, including long-term creep deflection due to sustained loads, plus immediate deflection due to live load, will not exceed span/480 for the Facility;

(b) For steel roof construction, the maximum live load deflection will not exceed span/360 and the total load deflection will not exceed span/240;

(c) For steel floor construction, the maximum live load deflection will not

exceed span/480 and the total load deflection will not exceed span/360. The total load deflection will include effects of shrinkage of concrete topping slabs; and

(d) The floor and roof perimeter edge will be designed to limit combined short and long term deflection occurring after the installation of exterior wall components, including effects of creep, to a maximum of 25mm.

(e) For non-loadbearing cold formed steel stud construction, the maximum lateral load deflection will not exceed span/240 for interior wall studs and L/360 for exterior wall studs.

7.3.2 Structural Steel

7.3.2.1 Quality Requirements:

(a) Material quality including sourcing and welding quality will be monitored by an independent testing agency. Refer to quality management plan.

(b) The preparation and painting of structural steel components will comply to the Master Painters Institute (MPI) Standards.

(c) Exterior exposed light gauge steel structure will be designed in accordance with CSA S136-16 (R2021), North American specification for the design of cold-formed steel structural members,

(d) and hot dipped galvanized to G90 in accordance with ASTMA653, standard specification for steel sheet, zinc-coated (galvanized) or zinc-iron alloy-coated (galvannealed) by the hot-dip process to a minimum 275 g/m2 or painted with a two-part epoxy paint system.

7.3.3 Cold-Formed Metal Framing

7.3.3.1 Overriding Principles

(a) Load bearing and non-load bearing steel studs are permitted as a component of the exterior wall systems to support exterior wall finishes and form an integral part of the perimeter envelope.

(b) Rain screen walls utilizing cold-formed metal framing will be non-load bearing.

(c) Load bearing steel studs will be independent of the principle structural system.

7.3.3.2 Quality Requirements

(a) Design, detail and construct load bearing steel stud structures to comply with all applicable CAN/CSA standards.

(b) The steel stud manufacturer will be certified in accordance with CSSBI Standard 30M-06 and all applicable CAN/CSA standards including CSA-A660.

(c) Comply to the Association of Wall and Ceiling Contractor's

Specification Standards Manual (AWCC).

7.3.3.3 Performance Requirements

(a) Limit maximum deflection under specified wind loads to L/360 (including masonry veneers), unless a smaller maximum deflection is specifically required due to wall finishes.

(b) Design wind bearing stud end connections to accommodate floor/roof deflections.

(c) Refer to 7.3.1.9(5) for non-loadbearing steel stud deflection limits."

7.4 Division 6 - Wood, Plastics and Composites

7.4.1 General Requirements

7.4.1.1 Provide rough carpentry, wood backing materials, backing boards for mechanical rooms and electrical/Communications Rooms, roof sheathing, copings, cant strips, finish carpentry and architectural woodwork, including exterior fascias, cabinets, casework, frames, paneling, ceiling battens, trim, installation of doors and hardware, and other wood-related products and applications as required:

(a) To meet the requirements of this SOR and as required for operation of the building.

(b) For wood products exposed to view in finished interior and exterior installations.

7.4.1.2 Not In Use

7.4.2 Architectural Millwork

7.4.2.1 General Requirements:

(a) Comply to North American Architectural Woodwork Standards (NAAWS). Comply with Quality Standards Manual for minimum "Custom Grade," and Door and Hardware Institute (DHI) standards for the design, fabrication, materials, installation, and workmanship of finish carpentry and architectural woodwork.

(b) All bottoms of sink cabinet boxes and areas that may come into contact with water will have a marine-grade plywood substrate. Fibre-board or particleboard are not permitted.

(c) Use marine-grade plywood substrate for countertops. Fibre-board or particleboard are not permitted.

(d) For millwork and cabinets, seal all wood surfaces and edges. All door, drawer and other exposed millwork edges will have applied an appropriately sized PVC edge strip, heat applied. There will be no P-Lam to P-Lam edges.

(e) Adhesives will be non-toxic, non-solvent glue to comply with NAAWS Quality Standards Manual, Canadian 'Eco-Logo' program, and CAGBC.

(f) All architectural woodwork hardware will meet the standards of AINSI/BHMA grade 1 Cabinet Hardware.

(g) Provide two-year North American Architectural Woodwork Standards (NAAWS) Guarantee Certificate for all architectural millwork.

(h) Millwork design will be simple in form with minimal moldings and trim. Millwork requirements are as required in Appendix 1B – Room Data Sheets.

(i) NAAWS Custom Grade; submit detailed shop drawings in design submittal appendix for the required millwork for the Owner's review and acceptance following review by the Design-Builder and Architect of Record.

7.4.2.2 Performance Criteria: Provide architectural millwork including all counters, cabinet units, shelving, hardware, finishing and installation as follows:

(a) All cabinets will be flush overlay construction.

(b) Design millwork so that no sharp edges are exposed, provide minimum 25mm radiused corner to countertops.

(c) Incorporate all required mechanical, electrical and communication services into the millwork so that wires and pipes are hidden from view, provide access panels to all services to allow for future adjustment.

7.4.2.3 Hardwood plywood:

(a) plywood only to ANSI/HPVA HP-1-2020, 19 mm C2 Whole Piece Face (C2WPF) 7 ply NOVA #2SSG OS HPVA HP-1, select White Birch, good one or two sides as required.

7.4.2.4 Hardwood lumber:

(a) hardwood only to National Hardwood Lumber Association (NHLA) requirements, moisture content of maximum 6% for interior work, select White Birch, to NAAWS Custom Grade, selected to match white birch plywood.

7.4.2.5 Filler Strip:

(a) All cabinets will be installed with filler strip where end contacts the wall.

7.4.2.6 Interior Trim:

(a) NAAWS Custom Grade, select White Birch.

7.4.2.7 Finishing Hardware:

(a) Cabinet pulls will be 100 mm rectangular shaped, commercial grade, stainless steel

(b) Drawer slides: commercial grade full extension with soft close will be installed on all drawers.

(c) Drawer / door locks: Commercial grade, finish to match adjacent hardware.

(d) Door catches: Double roller catch w/ plastic roller and diamond strike, commercial grade 2, complying to BHMA standards, Example: (large) Richelieu BP55292G and (small): Richelieu BP6032G or Owner-approved alternate.

(i) Radius all exposed plastic laminated edges and corners.

(e) Cabinet & shelf edging:

(ii) 3 mm Birch to exposed or visible edges of cabinets or shelves. 3mm PVC in colour to match cabinet or shelving where edging is not visible.

(f) Cabinet Shelves:

(iii) Will be adjustable unless specifically noted fixed. All adjustable shelves will be seismically restrained by the use of notches.

(iv) Shelf standards: metal finish in metal standard track, recessed into millwork.

(g) Cabinet Tops:

(v) Except as noted below, all cabinets and bookcases with the top less than 1625 mm above finished floor will have the top surface finished with plastic laminate or equivalent wearing surface upon approval of the Owner.

(vi) Cabinet tops in Science Rooms will be epoxy resin or phenolic, chemical and acid resistant.

(vii) Cabinet tops and countertops in Mechanic and Woodworking shops will be minimum 14 gauge stainless steel sheet metal with rolled edges over minimum ¾" plywood backing.

(h) Glass and Glazing:

(viii) Glass in casework or millwork will be tempered or laminated and captured on all sides. Glass will be removable in case of breakage.

(i) Finishing:

(ix) Shop finished in accordance with Section 1500 of the NAAWS Architectural Woodwork Quality Standards. Shelves and drawer fronts within cabinets will be considered "Exposed" for finish application.

a. Millwork will be clear finished.

b. Finish system: Conversion Varnish, Custom Grade.

(x) Plastic laminate:

a. Use high-pressure laminates on all laminate surfaces.

b. CAN3-A172-M79, 1.2 mm thick, (GPR), all smooth finishes.

(xi) Cabinet Locks:

a. Commercial grade. Finish to match surrounding hardware. All keying as approved by the Owner.

(xii) Showcase Locks:

a. Premium track with metal rollers. Track lock and track finger pulls keyed alike.

(j) Loading: Design millwork to withstand edge load of 100 kg per lineal metre of counter. All perimeter counters will be wall hung.

7.5 Division 7 - Thermal and Moisture Protection

7.5.1 Basic Requirements

7.5.1.1 The Design-Builder will retain a building envelope professional to perform an independent building envelope review noting specific provisions for the control of moisture, mold growth and deterioration inside the wall assembly.

7.5.1.2 Design construction assemblies to prevent the ingress of moisture or water vapour from the exterior through the building envelope and the passage of air through the building envelope from the interior spaces to the exterior and vice versa.

7.5.1.3 Design construction assemblies to prevent the ingress of moisture through foundation walls below grade, both subject and not subject to hydrostatic pressure.

7.5.1.4 Materials used in the building envelope assembly will be suitable for the use under the environmental conditions to which each will be exposed, including during the construction period.

7.5.1.5 Materials will be accessible for maintenance purposes provided that materials will not be removable without use of special tools.

7.5.1.6 All drawings will clearly and graphically depict the continuity of the weather-tight plane including air, moisture, and vapor barriers insulation, plus drainage and ventilation of assembly voids.

7.5.1.7 Face-sealed wall assemblies are not acceptable.

7.5.1.8 Consistent with the service life of the building, all components of the exterior

wall assemblies related to the weather-tight plane will be resistant to the deteriorating effect of exposure to the elements.

7.5.1.9 Use of overhangs to protect wall assemblies and glazing is encouraged; design roof to avoid unauthorized access to roof areas and deter climb ability.

7.5.1.10 Exterior envelope assemblies will shed (drain away) water. Materials and assemblies that minimize deterioration when wet and that have good drying capability must be used.

7.5.1.11 Use insulation, air space, or other acceptable means to eliminate direct paths of heat conduction. Door and window frames will be thermally broken.

7.5.1.12 The building envelope will resist air leakage caused by static and dynamic air pressures across the exterior walls, soffits, roof assemblies, windows, glass, doors, and penetrations or interruptions of the envelope system or assembly, in accordance with BCBC requirements.

7.5.1.13 To provide maximum adaptability for future reconfiguration of interior spaces, the Design-Builder will not incorporate a vapour barrier on the interior face of exterior walls or rely on an 'air-tight drywall' approach.

7.5.2 Dampproofing

7.5.2.1 Provide foundation wall surfaces with dampproofing coverage that is sufficient to repel and prevent moisture ingress in accordance with BCBC where no hydrostatic pressure is present and complying to AATC 127 - water resistance: hydrostatic pressure test; 1998.

7.5.3 Waterproofing

7.5.3.1 Provide waterproofing to prevent moisture ingress to occupied spaces below grade complying with ASTM E 96/E 96M - standard test methods for water vapor transmission of materials; 2005 and ASTM C 957 standard for high solids content, cold liquid applied elastomeric waterproofing membrane.

7.5.3.2 All below grade foundation walls, at grade slab edges and footings will be waterproofed.

7.5.3.3 Use membrane waterproofing to prevent water ingress over suspended slabs and decks and associated walls over habitable spaces where water collection is anticipated. Use traffic-bearing fluid-applied waterproofing for mechanical room floor Complying with ASTM E-514, standard test method for water penetration and leakage through masonry.

7.5.3.4 Provide waterproof membranes in exterior walls as part of the building envelope and integral with rain screen or cavity wall assemblies.

7.5.4 Vapor Barriers

7.5.4.1 Provide continuity of vapor seal materials and assemblies in conjunction with adjoining exterior wall construction.

7.5.4.2 Provide a single continuous vapor seal membrane as a secondary moisture shedding plane supported by wall structure; primary moisture shedding plane is the cladding.

7.5.4.3 Provide full adhesion of vapor barrier membranes per performance values of membrane manufacturer's tested assemblies.

7.5.4.4 Prevent water vapor transmission and condensation by means of a continuous vapor barrier membrane in wall assemblies, roofing assemblies, under concrete slabs-on-grade, and at interruptions to the integrity of wall and roof systems such as junctions with dissimilar assemblies, including:

(a) window and door frames.

(b) mechanical and electrical penetrations.

(c) structural and non-structural penetrations such as balconies, canopies, sun shelves and signage.

(d) wall/roof connections.

(e) changes in plane; and

(f) joints between like and dissimilar materials.

7.5.4.5 At underslab conditions, provide continuous vapour barrier not less than 0.15mm thick plastic sheet complying with ASTM E1745, Class A.

7.5.4.6 Conduct dew-point analysis to determine correct placement of vapor barrier within wall and roof assemblies. Coordinate locations of thermal insulation, waterproof membranes, and air and vapor barriers to prevent creation of dew point, resulting in condensation within assemblies.

7.5.5 Air Barriers

7.5.5.1 Provide continuity of air seal materials and assemblies in conjunction with adjoining exterior wall construction.

7.5.5.2 Provide a single continuous air seal membrane as a secondary moisture shedding plane supported by wall structure.

7.5.5.3 Provide full adhesion of air barrier membranes per performance values of membrane manufacturer's tested assemblies.

7.5.5.4 Prevent air leakage caused by air pressure by means of a continuous air barrier membrane in wall assemblies, roofing assemblies, under concrete slabs-on-grade, and interruptions to the integrity of wall and roof systems such as junctions with dissimilar assemblies, including:

(a) Window and door frames.

(b) Mechanical and electrical penetrations.

(c) Structural and non-structural penetrations such as balconies, canopies, sun shelves and signage.

(d) Wall/roof connections.

(e) Changes in plane;.

(f) Joints between like and dissimilar materials.

7.5.5.5 Provide air barrier assemblies that limit air exfiltration and infiltration through materials of the assembly, joints in the assembly, joints in components of the wall assembly, and junctions with other Building elements including the roof.

7.5.6 Thermal Protection

7.5.6.1 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, depending on seasonal conditions, and to avoid the absorption of water, or development of condensation within the insulated assembly.

7.5.6.2 Use thermal protection materials of a type and quality that will provide consistent environmental quality to enclosed spaces.

7.5.6.3 Foamed plastic insulation will not be used below the roof deck on roofs or in any wall construction except for foundation exterior insulation below grade.

7.5.6.4 Primary building insulation will be outside exterior sheathing.

7.5.6.5 Wall cavity insulation will be installed and secured to prevent sagging.

7.5.7 Sheathing

7.5.7.1 In any application sensitive to moisture exposure, condensation, or mold growth, do not use oriented strand board (OSB). Portland cement concrete, concrete masonry, treated exterior grade plywood, cement board, and glass-fibre-faced silicone-impregnated gypsum board are acceptable.

7.5.8 Cladding

7.5.8.1 Wall cladding materials will be durable, suitable for weather exposure and aesthetically integrated with the overall elevation appearance of the building.

7.5.8.2 Masonry, fibre cement boards/panels or smooth/polished face concrete masonry units will be used as the exterior material of the ground floor for no less than 4m from grade except at the entrance to the Indigenous Language & Culture Centre, which may have covered, exterior grade cedar paneling.

7.5.8.3 Steel cladding will be a minimum of 24 gauge.

7.5.8.4 Aluminum cladding will be composite, heavy duty gauge.

7.5.8.5 Fiber cement boards will be a minimum of 10mm thick.

7.5.8.6 Fiber cement panels will be a minimum of 11mm thick.

7.5.8.7 Where fibre cement is used below 4m, it will be provided with additional fastenings and back up support suitable for enhanced impact resistance.

7.7.8.8 The following wall cladding materials are not acceptable on this project:

(a) stucco / EIFS.

(b) fiber-cement panels less than 11mm thick.

(c) fiber-cement boards less than 10mm thick.

(d) wood cladding on surfaces exposed to weathering.

(e) smooth-faced concrete block or cast concrete walls except at service areas.

7.7.8.9 Cladding will be fastened to Building using manufacturer's recommended fastening intervals for commercial grade applications. Face-based fasteners are not to be used.

7.7.8.10 Girt systems will be utilized to maintain a minimum of 19mm air gap behind the rear-most face of cladding material, or greater as recommended by material manufacturer. Girts will be thermally broken.

7.7.8.11 Edges and corners will be detailed to minimize risk of tampering or breakage.

7.7.9 Roofing

7.7.9.1 General Requirements

(a) The roof assembly will:

(i) provide protection from weather.

(ii) resist the general and local effects of wind.

(iii) provide heat insulation and ventilation; and

(iv) be a low maintenance system in accordance with Good Industry Practice to minimize disruption to activities.

(b) All roofing systems will meet or exceed the manufacturer's specifications and the requirements of the Roofing Contractors Association of British Columbia (RCABC) Roofing Practices Manual.

(c) Installation (including monitoring, and reporting installation procedures, climatic conditions and unacceptable conditions) will be in accordance with Roofing Practices Manual published by RCABC (Roofing Contractors Association of British Columbia).

(d) Commissioning and acceptance testing of the roofing system will comply with BCBC and the RCABC Roofing Practices Manual.

(e) Comply with the Roofing Contractors Association of British Columbia Guarantee Corp (RGC) latest standards and requirements for a 10 year Guarantee following Substantial Completion as published in the RGC Roofing Practices Manual.

(f) Warranty will be assigned to the Owner upon Substantial Completion

(g) Comply with RGC Roofing Practices Manual "Acceptable Materials

List," including flexible membrane for reflective roofs – Elastomeric or Thermoplastic (single-ply system), Energy Star compliant (highly reflective) and high emissivity (of at least 0.9 when tested in accordance with ASTM 408).

(h) Roof assembly design including deck, vapor barrier, insulation, board stock, and membranes will comply with BCBC, fire classifications and with RGC requirements for wind uplift, live loads, dead loads, and snow loads. Comply with ULC Class 60 wind uplift classification.

(i) The Design-Builder will make all arrangements and pay all services to provide a 5 year RCABC guarantee for all roof systems.

(j) All roofs will prevent the penetration of water and snow and will provide for the drainage or shedding of water and snow clear of the Building.

(k) Roofs, including those at canopies will not drain to or allow snow to slide onto sidewalks, plazas or other occupiable areas.

(l) Roof-tops will have person-door and ladder access to allow for mechanical and electrical equipment maintenance except where stair access is required. Minimum roof hatch size will be 915mm x 1220mm. Roof hatch will be curb mounted with a minimum of 300mm above the finished roof to enable proper flashing.

(m) Provide roof tie-offs where required for equipment maintenance as per WCB requirements.

(n) Provide a fall restraint safety system for fall protection using equipment located a minimum of 2 metres from roof edge without using roof anchors.

(o) Install saddle flashings at box gutter ends and where parapets intersect walls.

(p) Ensure clips are used at unsupported plywood edges.

(q) Ensure windows on intersecting wall areas are of sufficient elevation to enable proper flashing, with a minimum of 300mm above roofing surface.

(r) Ensure louvered exhaust vents are of sufficient elevation to enable proper flashing. Allow a minimum 300mm height above the finished roof to enable proper flashing.

(s) Ensure proper sash sealants are detailed to prevent leaks into and behind wall flashing.

(t) Design for saddle flashings and diverters to prevent leaks at parapet/wall intersection.

(u) Ensure roof deck slopes away from doors, providing access to the roof deck.

(v) Acceptable roofing systems:

(i) 2-ply SBS membrane roofing system with 2.2 mm base & 3.0 mm cap sheets for roofs between 2 in 12 and 4 in 12 slope.

(ii) Adhered membrane roofing with vapor retarder base, insulation, decking, adhesive and PVC membrane at horizontal roof surfaces with slopes up to 10 degrees (2/12).

(iii) Modified bitumen built-up roof at horizontal roof surfaces with slopes up to 10 degrees (2/12).

(iv) Complete architectural metal roof system with hidden fasteners for slopes greater than 4 in 12.

(w) Roofing systems will include:

(i) flashings and sheet metal;

(x) Roof Edge Flashing and Copings: Capable of resisting wind forces applicable to Building according to FM Global Loss Prevention Data Sheet 1-90;

(y) Quality Standard(s): SMACNA's "Architectural Sheet Metal Manual" and Roofing Practices Manual published by RCABC;

(i) thermal insulation;

(ii) roofing specialties and accessories required for completion;

(iii) interior access systems to roof areas; and

(iv) internal roof drainage, including overflow scuppers, the capacity of which will equal or exceed the capacity of the roof drains and be designed such that they cannot be blocked by debris.

(z) Provide sheet metal flashings that divert water away from membrane flashing termination and protect the membrane from deterioration due to the exterior elements and mechanical damage. Provide roofing membrane continuously under the metal flashings. Ensure that sheet metal components comply with wind uplift requirements established for roofing system.

(aa) Near-Flat Roofs (slopes equal and less than 1:50):

(i) slope all roof surfaces to drains, including valleys and transverse slopes across top of parapets. Provide minimum slope to drain of 1:50 for field of roof or as required for roof material warranty;

(ii) use a minimum of two roof drains per contained drainage area. Overflow scuppers will be provided in an area visible for monitoring; and

(iii) overflow scuppers are not will be located where water flowing will effect walkways, entries or plazas.

(ab Steep Roofs (slopes greater than 1:6):

(i) configure steep roofs and perimeters so that snow, ice and rainwater do not create safety, maintenance or appearance problems. Design to prevent ice and snow from sliding onto areas intended for use by vehicles or pedestrians;

(ii) size and design eaves troughs to accommodate water from contributory roof and wall areas and to resist expected snow and ice loads;

(iii) pitched roofs will be insulated at the sloped roof line such that the space below is heated;

(iv) provide collection gutters at the edges of all sloped roofs;

(v) Provide an engineered snow and ice restraint device to prevent snow and ice from sliding off sloped roofs where such a threat will exist. The design of the Building, including the roof systems will ensure that entrance ways are protected from sliding snow and ice and will ensure that roofs are designed to RCABC requirements to account for accumulations of snow or ice where applicable.

7.7.9.2 Performance Criteria

(a) Deck:

(i) Prepare roof deck following the manufacturer's instructions for roof deck preparation.

(ii) Gymnasium roof will not have nails or screws penetrating into the interior of the Gym.

(b) Deck Overlayment:

(i) Prepare roof deck overlayment following manufacturer's instructions for roof deck overlayment preparation.

(c) Vapour Retarder:

(i) Follow manufacturer's instructions for vapour retarder preparation.

(d) Insulation:

(i) Ensure proper crickets or sloped insulation to prevent or minimize ponding, moss, lichens, early aging of roof. A minimum 2%, up to 5% slope will be used for crickets.

(ii) Provide roof blocking to prevent slippage.

(iii) Map under-deck roof conduit to prevent insulation screw penetration.

(iv) Ensure adequate spacing and number of insulation screws to prevent cupping; pulling away from parapets. Follow manufacturer's guidelines.

(e) Insulation Overlayment and Crickets:

(i) Sloped crickets will have an overlayment. Alternately, install crickets under the main insulation. Use variable length screws through nailable decks. Polyisocyanurate crickets will be used and adhered in adhesive over concrete decks.

(f) Membrane and Bitumen:

(i) Use only compatible materials for overlapping membranes.

(ii) Ensure stripping of insulation overlay joints to prevent burnout of expanded polystyrene (EPS) and extruded polystyrene (EXPS).

(g) Curbs:

(i) All curb heights will be a minimum 300mm.

(h) Parapets:

(i) Do not use gravel stop edges except if permitted by the SBS roofing manufacturer.

(ii) All parapets will be a minimum of 300mm.

(i) Equipment:

(i) Ensure a minimum of 300mm clearance is provided under elevated HVAC units or other equipment to enable inspection and maintenance of membrane.

(j) Smaller Equipment Resting on Roofs:

(i) Install 50mm thick EXPS under loose sleepers to spread and cushion load to prevent sleepers from sinking into the roof.

(k) Large Rooftop Equipment (over 275 kg.)

(i) Support large roof top units on:

1. structural pedestals or raised framework with at least 300mm clearance between the roofing system and the underside of the framework;

2. isolators to limit HVAC related noise and vibration to acceptable levels; and

3. on curbs where access under the unit for maintenance to roofing is not required.

4. It is acceptable to integrate large rooftop units into the roofing system as long as serviceable components are accessible within the rooftop units and not within the ceiling space.

(l) Drains and Scuppers:

(i) Install rainwater leader discharge splash pans to prevent erosion of roof membrane.

(ii) Drain grills will have lock-down clamps, straps, or other means of security to help prevent grill removal.

(iii) Water test drains for defective “O”-rings, U-flo.

(m) Metal Flashing:

(i) Use only double gumlips, or reglets.

(ii) Cross-break wide metal flashing to prevent oil-canning.

(iii) SBS Roofing:

1. Follow the detailed manufacturer’s specification.

2. Ensure adequate SBS torching to prevent blisters and lack of cap sheet bond.

3. Specify SBS roofs for slope over 2 in 12 and up to 4 in 12. Very small roof sections steeper than 4 in 12 can receive an SBS roof, applied parallel with the slope and fastened at the peak.

(n) Architectural Metal Roofing

(i) 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 persons.

(ii) Metal roofing and flashings will be watershedding and not waterproofing.

(iii) Provide a waterproofing membrane below all metal roofing and flashings.

(iv) Drain water will be collected to prevent slipping hazards from ice formation at drain discharges.

(v) Fasteners and roof penetration details that will accommodate thermal movement are required.

(vi) Installation system will use thermal breaks.

(vii) Ponding of water on roofs is not permitted.

(viii) Follow the detailed manufacturer's specification.

(ix) Breadpan metal roofs and install foam closure strips.

(x) Design for hidden fasteners on metal roofs.

(xi) Design for concealed gutters.

(xii) Install adequate clips on metal coping flashings to prevent blow-off under high wind.

(xiii) Specify metal profile roof and KYNAR paint finish to prevent rapid fading, rusting (especially at raw cut edge), lichen build-up.

(o) Fall Protection / Maintenance Access

(i) Provide an engineered snow and ice restraint device to prevent snow and ice from sliding off sloped roofs where such a threat will exist. The design of the Building, including the roof systems will ensure that entrance ways are protected from sliding snow and ice and will ensure that roofs are designed to RCABC requirements to account for accumulations of snow or ice where applicable.

(p) Control zones

(i) Roof markings will be provided permanently denoting control zones.

7.7.10 Fire and Smoke Protection

7.7.10.1 Where an assembly has a fire resistance rating, base assembly rating on tested assemblies from NBCC, NRC, ULC, UL or WH.

7.7.10.2 Use spray-applied cementitious fireproofing or intumescent painting if required, to achieve a fire resistance rating.

7.7.10.3 Spray-applied cementitious fire proofing will comply to BCBC and ASTM E 605 and CAN/ULC –S102 standards.

7.7.10.4 Spray-applied cementitious fireproofing is not to be visible in any parts of the Building except service areas.

7.7.10.5 Integrate barriers into vertical and horizontal space separations to protect against the spread of fire and smoke. Apply protection to exposed building elements (structural and non-structural) susceptible to fire and subsequent damage.

7.7.10.6 Penetrations of vertical and horizontal fire-resistance rated separations will be fire-stopped.

7.7.10.7 Use firestopping and smoke seal systems that consist of asbestos- free materials and systems, capable of maintaining an effective barrier against flame, smoke, and gases.

7.7.10.8 Use firestopping that:

(a) is compatible with substrates.

(b) allows for movement caused by thermal cycles; and

(c) prevents the transmission of vibrations from pipe, conduit or duct to structure and structure to pipe, conduit or duct.

7.7.10.9 When more than one product is required for a firestopping assembly, use products that are compatible with one another and from the same manufacturer. Firestopping products will comply with requirements established for ULC tested assemblies.

7.7.10.10 Use firestopping sealants and coatings that are silicone-based and guaranteed not to re-emulsify if subject to wetting or standing water. Acrylic-based coatings and sealants are not permitted.

7.7.10.11 Field testing will be conducted by an independent testing agency provided and arranged by the Design-Builder.

7.7.10.12 All fire-stopping will be installed by an FM Global-approved firestop contractor or a UL-qualified firestop contractor.

7.7.10.13 The Design-Builder will engage an agency in accordance with ASTM E2174 to inspect all firestopping installation.

7.7.10.14 Firestopping and smoke seal systems will be capable of maintaining an effective barrier against flame, smoke, and gases when tested to CAN/ULC-S115 or ASTM E814 or UL 1479, be acceptable to all applicable Authorities Having Jurisdiction, and not exceed opening sizes for which they are intended.

7.7.11 Sealants

7.7.11.1 Sealant materials will be applied to:

(a) prevent water ingress through the building envelope systems and around openings in the building envelope systems;

(b) seal joints between dissimilar or similar materials and to allow smooth or even transitions; and

(c) seal expansion or controls joints in the building envelope systems and structural systems and to allow movement.

7.7.11.2 Apply sealant materials to achieve:

(a) seals to the building envelope systems and around openings in the building envelope systems as required to prevent water ingress;

(b) seals around and over cavities in or behind surface elements to allow effective infection prevention and control;

(c) sealant around door frames will include joints at bottom of door frames (between floor finish and frames);

(d) sealed expansion or control joints in the building envelope systems or structural systems to allow movement caused by thermal changes.

(e) prevention of concealment of contraband.

(f) prevention of the ability for students to disassemble materials or pick at materials;

(g) for the exterior, use sealants to completely and continuously fill joints between dissimilar and/or similar materials.

(h) for the interior, use sealants (at frames such as those at doors, and windows), to completely fill joints between dissimilar materials using one component, acrylic emulsion, paintable type.

(i) seal all top edge of equipment rails and hand, bumper and crash rails to wall.

(j) caulking to washroom plumbing fixtures will be silicone, mildew-resistant and impervious to water.sealants applied to expansion and control joints in concrete floors requiring self-levelling properties will be two-component epoxy urethane sealants for

horizontal surfaces.

(k) use sealants with self-levelling properties for expansion and control joints in concrete floors using two-component epoxy urethane sealants.

(l) use sealants that allow for minimum 25% movement in joint width; and

(m) in corridors and other traffic areas used by equipment use traffic bearing type sealants suitable to support imposed load without deformation or failure.

7.8 Division 8 – Openings

7.8.1 Basic Requirements

7.8.1.1 Except where fire-rated ceramic glass is required in accordance with the BCBC, construct interior windows and sidelights of tempered glass. For all exterior glazing at doors and sidelights, use tempered glass.

7.8.1.2 Windows and doors will comply to the applicable code requirements.

7.8.1.3 All exterior frames will have the wall air, vapor, moisture membrane mechanically fastened into the frame by the means of a pressure plate.

7.8.2 Doors

7.8.2.1 Provide doors that suit the intended function of spaces or rooms requiring acoustic or visual privacy, security, special HVAC requirements, fire-resistance rated separations or other closures.

7.8.2.2 Provide door openings 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.

(a) Mechanical and electrical room doors will be sized to move pieces of equipment in or out over the Design Life of the Building, and no less than 1067 wide and 2440 high.

(b) For spaces with equipment that would not fit through the door size noted above, provide alternate means for allowing equipment replacement for larger clearance requirements.

7.8.2.3 For all doors: floor mounted rails, slides and/or locking pins are not permitted (top mount only).

7.8.2.4 Glazing in doors (interior and exterior) will allow for proper security, sight lines and the use of Natural Lighting as per Appendix 1B - Room Data Sheets.

7.8.2.5 For acoustic requirements for doors: refer to Appendix 1C - Acoustical Chart.

7.8.2.6 Apply door sizes and designs consistently to rooms of similar use, location, and configuration.

7.8.2.7 Do not permit doors to swing into corridors in a manner that may obstruct traffic flow or reduce the corridor width or inhibit egress, except doors to

spaces that are used infrequently and are not subject to occupancy such as small closets.

7.8.2.8 Door Glazing

(a) For exterior hollow metal door glazing, use sealed units with warm edge, argon filled space in thermally broken frames to prevent heat loss.

(b) Exterior glazing at doors and side lights will be tempered.

(c) For interior door glazing, use tempered laminated safety glass.

(d) Frameless interior doors are not permitted.

7.8.2.9 Exterior Doors

(a) General Requirements

(i) Exterior doors will be commercial exterior-grade, glazed insulated pressed-steel doors except as noted below.

(ii) Pairs of Building entry doors will be a minimum of 915 wide each and 2150mm high.

(iii) Exterior doors will be hung in well-anchored pressed steel frames suited to the type of door.

(iv) Install in an aluminum curtain wall system or storefront glazing system, compatible aluminum doors may be used provided they are designed for high use areas and constructed with sufficient steel reinforcement to withstand the rigors of a high school environment.

(v) Main entry doors and those for Gymnasium access after hours will be provided with a minimum of one power-operated leaf, activated by accessible push plates.

(vi) Door frames will be complete with concealed conduit and strike plates for an access control system at the following locations:

1. Exterior doors – Main entry, entries to the Indigenous space, childcare space, and the entry to the Gymnasium after-hours entrance.
2. Include allocation for 3 more exterior locations.
3. Interior doors providing access control and/or separating School areas from community use areas.

(vii) Coordinate functions of multiple electronic systems where required to eliminate conflicts and ensure smooth operation.

(b) Performance Criteria

(i) Pressed steel doors and frames:

1. Fabricate to Canadian Steel Door Frame Manufacturers Association (CSDFMA) specifications for steel doors and frames.

2. Fabricate from commercial grade sheet steel, Class 1 with ZF075 zinc coating to ASTM A525-87. Knock down frames are not permitted.

3. Exterior doors will be 45 mm thick, fabricated from 14 gauge (1.6 mm) steel with core composed of rigid modified polyisocyanurate, closed cell type; minimum 32 kg/m3 and RSI 1.9. Top of door will be fitted with a weather cap. Frames will be insulated, thermally broken, fully molded type fabricated from 14 gauge (1.6 mm) galvanized steel. Provide weather-stripping.

4. Mortised, reinforced, drilled and tapped to fit hardware manufacturer's templates.

5. Galvanized steel frames with mitred, welded corner joints, ground, filled and dressed smooth. Provide additional reinforcing at door closer mounting locations.

6. Provide exit and egress doors with vision panels.

7. Provide half-light glazing to top and bottom (horizontal stile at access hardware level) to all exterior entrance doors.

8. Glaze with pre-formed, pre-shimmed butyl bedding tape.

9. Glaze with insulated tempered laminated safety glass.

(ii) Aluminum Entrances and Storefronts

1. Aluminum entrances, curtain wall fabrications and doors may form part of the exterior envelope of the Building or provide glazed interior partitions.

2. Aluminum doors will be used within aluminum entrances and curtainwall framing.

3. Aluminum entrances and storefront framing and doors may form part of the exterior.

4. Provide glazed interior partitions as appropriate to comply with the functions of the spaces as defined by Appendix 1B - Room Data Sheets.

5. Use frames that are thermally-broken, flush glazed, aluminum sections, to accept insulating glass units.

6. Incorporate in the frames drained and vented, rainscreen system with a complete air and vapor seal, allowing any moisture entering the frame to drain to the exterior and allowing air into the pressuring chamber.

7. Apply aluminum finish for exposed aluminum surfaces. Finish will be permanent and resistant to corrosion caused by weather exposure and climate.

(iii) Exterior overhead doors:

1. Insulated steel sectional upward-acting type.

2. Design panels to withstand wind load of 0.83kN/m2 with a maximum horizontal deflection of 1/240 of opening width. Door sections will be roll-formed 0.76 mm continuous steel coil, hot-dipped galvanized (G-90), pre-painted with baked-on primer. Back panel will be 0.45 mm steel with baked-on primer. Insulate panels with AF530 Fibreglass or equivalent insulation 50 mm thick, RSI 1.4.

3. Box (hat) shaped muntins and end stiles will be formed of 0.91 mm hot-dipped galvanized steel.

4. Bottom sections will have a tubular neoprene astragal held by a continuous P.V.C. retainer filled to bottom section.

5. Provide full perimeter weather stripping.

6. Electrically operated with remote operation and chain-driven manual override. Track will be heavy duty trolley type lift, with high-cycle springs rated at a minimum 100,000 cycles. Doors will be locked with a cylinder lock compatible with other door hardware.

7. Required locations include Automotive / Mechanics Department, Woodworking Shop Department and the Metals Shop Department.

8. Doors will be tied to building control systems to deactivate mechanical system upon opening.

(iv) Provide exterior door type requirements as specified in Appendix 1B – Room Data Sheets.

7.8.2.10 Interior Doors

(a) Performance Criteria

(i) Interior doors and frames:

1. Wood doors:

- Materials and fabrication to NAAWS Quality Standards, Section 1300, Custom Grade to CSA 0132.2 M1977 with 12 mm min. thick vertical edge strips to match face veneer.

- Provide glazing to all doors to administration and staff offices to accessibility Code requirements.

- Wood doors will have hardware and finishes that suit

the intended function and aesthetics of the Building. Use Grade A faces for transparent finish. Factory finish is required for doors with transparent finish; use UV-cured polyurethane finish system. All wood door edges will be sealed.

- Provide heavy duty commercial grade wood doors in flush design, Custom Grade quality (as defined in the NAAWS standards referred to above), 5-ply bonded particleboard core.

- All wood doors will resist malicious damage and damage from expected use over the life of the building.

- All wood doors will be easily maintainable and repairable.

- All wood doors will comply with fire resistance requirements when used in a rated wall assembly. Provide fire-resistance rated doors with a homogeneous incombustible mineral core and NAAWS Quality Standards Option 5 blocking.

- Frames will wrap around the wall assembly they are installed into, such that the frame projects a minimum 13 mm proud of the face of the wall each side of the frame.

- Frames will be compatible with adjacent wall assembly (in terms of anchorage, fire protection, weight of door and repetitive slamming).

- Doors with an inactive leaf will not be floor bolted. Bolt into frame instead.

- Install finish hardware securely. Fasten to solid wood backing, except where hardware is designed to be through-bolted.
- Glue stiles, rails and faces to the core with Type II water-resistant adhesive complying to ANSI/HPVA HP-1-1004 and ASTM D5572-95(2019) to minimize de-lamination or disassembly as a result of moisture ingress.

- Provide stainless steel door edge guards on wood doors in areas accessible to students and in areas where door abuse is expected.

2. Pressed steel doors and frames:

- Fabricate to Canadian Steel Door Frame Manufacturers Association (CSDFMA) Specifications for steel doors and frames.

- Fire ratings will be identified by labels in compliance

with CAN/ULC S104 and CAN/ULC S105:2016 (R2020)

- Minimum 45 mm thick, fabricated from minimum 1.21 mm (18 gauge) galvanized steel, with steel stiffeners at 150 mm on centre. Interior steel frames will be fully welded units, fabricated from 1.52 mm (16 gauge) galvanized steel.

- Doors will be mortised, reinforced, drilled and tapped to fit hardware manufacturer's templates, and glazed where specified.

- Transom glass sections will be no greater than 1200 mm in width and provided with additional mullions to ensure that the top door jamb is properly supported to minimize sagging and the associated door binding.

3. Interior Aluminum Sliding Doors and Sidelights

   - Interior sliding doors and sidelights will have recessed mounted track with sliding and fixed panel(s), and include single glazing with 6 mm clear fully tempered float glass or as required to meet acoustic requirements complying with NBC 2015 STC ratings.

4. Coiling Counter Shutters – Metal:

   - Operation by hand. Provide continuous extruded aluminum lifting strap on inside face of shutter bottom.

   - Curtain: Extruded aluminum interlocking slat sections. Finish will be clear anodic finish, length and height as shown on drawings. Provide continuous vinyl bumper to bottom bar.

   - Guides: extruded aluminum, 5 mm thick, finished as curtain.
   - Hood: enclosed, counter balanced assembly with aluminum brake formed sheet hood finished as curtain.

   - Counter balance: Provide an enclosed torsion spring balance assembly with 25% overload factor, encased in steel tube to support curtain with a maximum deflection of 1/360th of opening width. Provide adjusting wheel, accessible for setting.

   - Locking: Equip shutters with lockable slide bolts on the inside.

   - The coiling counter shutter will provide fire ratings where and as required.

5. Coiling Security Screen:

   - Grill Curtain: aluminum, 7.9 mm horizontal rods and

hinged vertical connecting links on 152 mm centres. The bottom bar will be tubular in shape. Curtain will be locked in closed position with self-activating lock.

- Guides: Extruded aluminum with a return loop to prevent felt from pulling out of guides. Guides will be complete with wear strip to eliminate metal to metal contact.

- Brackets: Fabricated from steel plate not less than 6.4 mm thick.

- Barrel: To be not less than 152 mm diameter steel tubing and designed to limit maximum, deflection to 2.5 mm per lineal metre of opening width. Grille curtain will be counter balanced by oil tempered springs.

- Operation: Electric motor operation with key-operated push button control. Motor size to suit size and weight of screen.

- Hood: Will be formed to fit the curvature of the bracket.

- Finish: Aluminum, clear anodized.

- Keying cylinder will match the Owner's system.

6. Electrically operated, roll-up fabric gymnasium divider.

- Material: Full height curtain: Opaque solid vinyl coated polyester fabric

-Guides: Top-hung, institutional grade.

-Operation: Electric motor operation with key-operated push button control. Motor size to suit size and weight of the curtain.

-Finish: Selected from manufacturers standards. To be approved by the Owner.

-Full Length of the gym held back from the wall to provide a walk way at both ends. Bottom to hang 50 mm above floor in down position.

(b) Provide interior door types as specifies in Appendix 1B – Room Data Sheets.

(c) Sidelights will be 305mm wide minimum, and match the adjacent door in height.

(d) Door lights will be of maximum size to fill the upper half of the door.

(e) Where not specified in Appendix 1B – Room Data Sheets, provide doors as follows:

(i) common corridor doorways will have door lights to provide visibility except where prohibited by code.

7.8.2.11 Exterior Roll Shutters

(a) Exterior Roll Shutters will be provided on all exterior windows on the first floor. Exterior Roll Shutters will not cover doors, but will cover lites in assemblies incorporating doors. Exterior Roll Shutters will not be provided on full height curtainwalls at the major common spaces, being the multipurpose room, entry foyer and interconnected flex spaces.

7.8.3 Hardware

7.8.3.1 General Requirements

(a) The Design-Builder will engage a door hardware consultant to prepare a representative hardware schedule which meets the quality standards for each type of hardware on the facility. Door hardware schedule will list door number, operation, hand, name of the manufacturer, size, code number and finish. The Design-Builder will submit a fully-itemized complete hardware schedule, developed in consultation with the Owner to meet the requirements of the proposed design. A final copy of this schedule will be submitted to and approved by the Owner prior to construction.

(b) A master keyed system and a grand master keyed system to match the Owner's existing keying system will be provided, to the approval of the Owner.

(c) Provide all hardware necessary for security and the proper operation of the Facility.

(d) Use one manufacturer's products for all similar items.

(e) Galvanized steel bollards will be used as door stops to permit 129 degree opening on all exterior doors, complete with neoprene stopper securely fastened to bollard at point of contact 100-150 mm below lockset, centered on lockset.

(f) All exterior door hardware will be through-bolted.

(g) Finish hardware will comply with all applicable Standards, including the quality standards of the Door and Hardware Institute (DHI).

(h) Provide all finish hardware from one supplier that is a member in good standing of the Door and Hardware Institute (DHI) and has in its employ one or more AHC (Architectural Hardware Consultant).

(i) Hardware will be integrated with the security requirements and coordinated with electrical wiring and power requirements.

(j) Select finishes providing maximum longevity and preservation of the finish.

(k) Provide, where applicable, ULC-listed hardware for the required fire rating.

(l) Provide all doors with bumper protection at walls to avoid damages.

(m) All doors are to have a minimum of three hinges.

(n) Door sweeps will be provided on all exterior doors.

(o) Provide glazing in doors and sidelights to allow for appropriate operational requirements of the spaces they serve.

7.8.3.2 Performance Criteria

(a) Locks and Latches:

(i) Bored and pre-assembled locks to CAN/CGSB-69.17, heavy-duty commercial hardware to ANSI Series 4000, Grade 1, designed with full return lever handles. Strikes: box type, lip projection not beyond jamb. Cylinders: keying system will be compatible with Schlage "Conventional" Series, with "ND" levers**.**

(ii) At exterior doors latches will be protected by a guard plate or other intrusion-shielding device.

(iii) The following lock types are not permitted for outside doors: magnetic pins, padlock, non-supervised code operated, combination lock, and disc tumbler.

(b) Locksets, Latchsets and Cylinders:

(i) Electronic locksets are to be compatible with Schlage “ND” or “NDE” series, or approved alternative.

(ii) Mechanical locksets are to be Schlage, “ND” Series levers with ‘Conventional’ cylinders, vandal proof, ASA 626, or approved alternative.

(iii) All locksets will have the following:

1. Backset: All locksets and latchsets will have 69.8 mm backset.

2. Strikes: All locksets and latchsets will be supplied with Schlage ASA strikes, or approved alternative.

(iv) All cabinet locks will be keyed the same throughout.

(v) Display cases to have track-mounted showcase lock.

(vi) Shutters: Provide key switch in public areas.

(c) Keying

(i) Provide access control door hardware to allow remote control and programming of any door on the system. To be acceptable, any proposed equivalent must be fully compatible with and be demonstrably capable of being seamlessly integrated with the system that is currently in use by the Owner.

(ii) Provide Schlage “Conventional” cylinders or as approved by the Owner. To be acceptable, any proposed equivalent must be fully compatible with and be demonstrably capable of being seamlessly integrated with the Schlage “Conventional” system that is currently in use by the Owner.

(iii) Basic Requirements

1. The Design-Builder will prepare and submit a proposed access control and key schedule for the Building, during the development of construction drawings. The proposed key schedule will include details of the master access control and keying system for the Building and will minimize the requirement for Staff to carry keys and the number and type of keys required for the Building.

2. Provide a restricted keyway system for all lock cylinders in the Building. The restricted keyway system will be obtained from the applicable lockset manufacturer(s) on behalf of, and in the name of, the Owner. The Owner will control the restricted keyway system, such that all spare keys and key blanks will be ordered by an authorized representative of the Owner.

(d) Butts: doors will be equipped with 1-1/2 pairs, 115 mm ball-bearing butt hinges, minimum, non-removable pins, to CAN/CGSB-69.18, brass or bronzed plated, finish C26D.

(e) Exit Devices: to CAN/CGSB-69.19, type modern and be surface mounted. Product will be: Von Duprin, Series XP 98 / 99 vertical rod, C26D finish or Owner-approved alternate.

(i) All exterior double doors will be provided with full height astragal.

(ii) All hardware will be compatible with the security systems wherever electric strikes or door monitoring are required.

(f) Door Kick Plates to high use areas: 1.27 mm thick stainless steel, to CGSB 69¬GP-6M type 6-320, 250 mm high x width of door (less 40 mm on push side).

(g) Threshold: extruded aluminum, full width of door opening, mill finish at all exterior doors, and at interior doors at changes of floor finish and where otherwise required. To accommodate for disabled accessibility complying to ADA requirements . Product will be Pemko or Owner- approved alternate.

(h) Door Pulls: aluminum, finished to C26D, or stainless steel, finished to 630. Provide oversize push plates at each location.

(i) Weather-stripping:

(i) Exterior doors will be fully weather stripped.

(ii) Head and jamb seal: extruded aluminum frame and solid hollow closed cell neoprene insert, clear anodized finish.

(iii) Door and bottom seal: extruded aluminum frame and solid closed cell neoprene, surface mounted with drip cap.

(iv) Door bumpers: neoprene.

(v) All weather-stripping will be rodent-proof.

(j) Sound Seals: all doors through walls where significant sound isolation is required will be provided with:

(i) Perimeter seal will be magnetic weather stripping; and

(ii) Automatic door bottoms will be non-magnetic weather stripping.

(k) Door Closers:

(i) Will be a spring load door opening device. Size to suit doors, aluminum finish, with through bolts at wood doors. Delayed action will be provided where required for handicapped.

Accessibility complying to BCBC, 3.8.1.
Owner's standard: LCN 4111.

(ii) Door coordinating hardware is not required or acceptable on paired doors with closers.

(l) Astragals:

(i) Wood doors: Full height, fastened as required.

(ii) Metal doors: Full height, fully welded steel astragals.

(m) Automatic swing door operator:

(i) surface mounted, self-contained unit, in housing to match width of frame, electrically operated, with two square stainless steel push plate switches. Unit will function as a manual door closer in event of power failure, and will operate at all other times as either manual or automatic device. Provide key-operated on/off switch. Unit, accessories, and signs and labels to meet all requirements for handicapped accessibility complying to BCBC, 3.8.1...

(n) Magnetic hold-open devices for doors:

(i) Wall-mounted magnetic hold-open devices will be incorporated for all doors in general circulation and those

leading to exit stairs.

(ii) Devices will be released upon actuation of the Fire Alarm system and able to be released manually.

7.8.4 Glazing

7.8.4.1 Glass and glazing will comply with all applicable Standards, including the Insulating Glass Manufacturers Association of Canada [IGMAC] Guidelines and the Glazing Contractors Association of B.C. [GCA] Glazing Systems Specifications Manual.

7.8.4.2 Provide assemblies that resist local seismic conditions as defined in the BCBC.

7.8.4.3 Provide assemblies that resist local climatic events as defined in BC Building Code.

7.8.4.4 Use tempered laminated safety glass in all glazed doors and sidelights and the inboard light of a double-glazed skylight.

7.8.4.5 Exterior Glazing

(a) General Requirements

(i) All exterior glazing to be tempered glass.

(ii) Provide as required to meet building energy requirements.

(iii) Exterior glazing will be a minimum of 20% of the Building exterior calculated as an average of all floors above and including the main entry level.

(iv) Optimize daylight and/or Natural Light and views to regularly occupied interior spaces. Use strategies to deliver Natural Light deeply into spaces and provide meaningful ties between the interior and the exterior while balancing heat loss, solar gain and glare.

1. Employ sun shading devices/light-shelves for southwest facing glazing.

2. Reflective or darkly-tinted glass is not permitted.

3. Applied solar films are not permitted.

(v) Provide vertical exterior glazing to each required space.

(vi) Glazing will start no higher than 1000mm above the floor level or at the ceiling height (whichever is lower) of the associated space.

(vii) Follow "Glazing Systems Specifications Manual" recommendations as published by the Glazing Contractors Association of B.C. for glazing systems selection, specifications and installation. Minimize heat gain within the rooms by use of screening and sun-shading.

(viii) Provide at least two operable windows per typical Classroom (Classroom 22.02 and Exploration Classroom 22.03) space, as required by Appendix 1B – Room Data Sheets with limiters on operable windows where required for security or safety reasons as determined by the Owner.

1. Locate operable windows on the exterior of the Building to provide natural ventilation for Occupants except operable windows to interior central space may be used where such windows provide natural, passive ventilation and borrowed daylighting.

(ix) Glazing will provide for excellent optical clarity with ease of maintenance over the design life of the Building.

(x) Design glazing and interior surrounds to allow uniform, unobstructed movement of conditioned air across the glass and frame.

(xi) Select glazing in consideration with the lighting and mechanical systems to prevent glare and solar overheating.

(xii) Provide uniform glazing sizes for the purposes of maintenance and ease of replacement.

(xiii) Based on known local climatic data provide windows to Good Industry Practice that comply with the following standards:

1. CAN/CSA-A440-00/A440.1-00, Windows and its appended Special Publication;

2. User Selection Guide to CSA Standard CAN/CSA-A440.1-00;

3. Windows: Aluminum Association Standards (AAS), and the American Architectural Manufacturers Association (AAMA) field testing specifications;

4. Air-tightness – per CAN/CSA-A440.0 and CGSB Requirements 82.1;

5. All exterior glazing will be installed and maintained from the exterior of the Building; and

6. Provisions will be made in the building cladding for maintenance of the exterior glazing.

(xiv) Operable windows will be a minimum of 400 mm high; be top hung, and have outward opening lights.

(xv) All operable windows must be lockable and secure when not open.

(xvi) When width of opening exceeds 610 mm, provide operable windows with a minimum of two handles.

(xvii) Extended Warranty

1. Sealed glazing units will be warrantied for a minimum of five years.

(xviii) Field Testing

1. Representative samples of installed glazing systems will be field tested for compliance to required performance criteria.

(b) Performance Criteria

(i) Glazing systems will be commercial grade, meeting requirements of CAN/CSA-A440-M90. Minimum allowable rating for windows will be as required for the location under applicable regulations. Light weight residential quality windows will not be used.

(ii) System Design:

1. Allow no water infiltration into the Building.

2. Ensure no condensation forms on interior surfaces of aluminum before exposed areas of sealed glazing units reach dew point.

3. Thermal and structural expansion and contraction will be accommodated.

4. Through-joints at window sills, heads, jambs, and interconnections will not be permitted

5. It is unacceptable to rely on caulking for weatherproofing.

6. Maintain continuity of air and vapour seals as part of wall construction.

7. Glazing in doors and sidelights will be 200 mm above finished floor.

8. The use of glass block walls in any wall system is not permitted.

9. Provide glazing systems that ensure ease of glass replacement and maintenance.

10. Use High Performance (double or triple pane, low "e" glass with argon fill) glazing or better.

11. Tempered Laminated safety glass will be used at all exterior doors, sidelights, and transoms, and glazed openings within 900 mm above the finished floor.

(iii) Analysis of energy requirements and environmental loading

on HVAC systems will be performed in conjunction with glazing design.

(iv) Translucent, insulated fiberglass panel systems are acceptable for use in spaces where day-lighting is required but glare will be avoided complying to ASTM E 2141.

(v) Window/wall interface:

1. Completely seal off the perimeter of the window's rough opening with a rubberized asphalt peel-and-stick membrane. Ensure the integrity and drainage of the weather-tight plane of the wall assembly is enhanced, rather than impeded by, the membrane. Use glass fibres or foam insulation to finish all voids.

2. Flashings will be of a suitable corrosion-resistant material, and pre-finished metal will be used where exposed.

3. Exterior window sills will be flashed and sloped away from the window and will have a projection drip. The backs and ends of sill will be turned up to form a three-sided pan. Make ends, laps and intersection of sill flashings watertight. Treat flashing edges so as not to form a safety hazard at the exterior.

4. Provide flashing at window heads.

(vi) Operable Windows

1. Meet requirements of IGMAC (Insulating Glass Manufacturers Association of Canada).

2. Glazing tape, where employed, will be pre-formed, pre-shimmed butyl, and have corners sealed with acrylic-based sealant.

3. Use neoprene or EPDM glazing gaskets.

4. Weather-stripping:

a. Operable windows will be fully weather-stripped using neoprene material or heavy-duty EPDM.

(c) Aluminum Curtain Walls

(i) Aluminum curtain walls will comply with all applicable Standards, including the Aluminum Association Standards (AAS) and the American Architectural Manufacturers Association (AAMA) field testing specifications.

(ii) Incorporate in the curtain wall framing a drained and vented system complete with air and vapor seal, allowing any water entering the framing/system and the glazing detail cavities to drain to the exterior and allow air into the pressuring chamber.

(iii) Provide curtain wall framing that incorporates a thermal-break.

(iv) For exposed aluminum surfaces, provide a finish that is permanent and resistant to corrosion resulting from weather exposure and climate.

(v) Provide assemblies that resist local seismic conditions and climatic events as defined in BC Building Code.

(vi) Applied solar films are not permitted.

(d) Aluminum Windows

(i) Aluminum windows will comply with all applicable standards, including the Aluminum Association Standards (AAS) and the American Architectural Manufacturers Association (AAMA) field testing specifications. Provide Architectural Grade windows unless otherwise noted.

(ii) Incorporate in windows a drained and vented system complete with air and vapor seal, allowing any water entering the framing/system and the glazing detail cavities to drain to the exterior and allow air into the pressuring chamber.

(iii) Provide windows that incorporate a thermal-break.

(iv) For exposed aluminum surfaces, provide a finish that is permanent and resistant to corrosion resulting from weather exposure and climate.

(v) Provide assemblies that resist local seismic conditions and climatic events as defined in BC Building Code.

(vi) Applied solar films are not permitted.

(e) Aluminum Framing Systems

(i) Anchors for the framing will be located within the vertical tube sections or on the sides of the tubes as strap anchors. The anchors will be designed to allow for thermal expansion and contraction of the frame. The design of the anchors will not interfere with the adhesion of the air, vapor, and moisture membranes from the wall directly to the tube face of the section.

(ii) Mechanically retain the air seal membrane to the tube face of the section with the use of an aluminum anti-rotation channel or equivalent.

(iii) Gaskets and weather seals will be mechanically keyed in dry glazing systems for both interior and exterior applications.

(f) Clerestory Glazing

(i) For exposed aluminum surfaces, provide a finish that is permanent and resistant to corrosion resulting from weather exposure and climate.

(ii) Clerestory windows will be fully accessible for maintenance and cleaning from the interior and exterior of the Building without disruption to the Building operations.

(iii) Air seal and water seal connections to curbs and walls will be fully accessible and will not be dependent on construction sequence.

(iv) Provide drainage of water entering the glazing system to the exterior under all conditions.

(v) Design glazing to prevent condensation on the interior face of the glazing or framing system. Provide interior gutters to catch water in the event condensation occurs. Drain condensation gutters to the interior.

(vi) Provide dry glazing.

(vii) Glazing framing systems will provide for the mechanical attachment of air, vapor, and moisture membranes.

(g) Tubular Natural Lighting Devices (light tubes)

(i) Tubular natural lighting devices are permitted where required to provide necessary Natural Light to interior spaces.

(ii) Provide tubular natural lighting devices as follows:

1. transparent roof mounted skylight dome and self-flashing curb, reflective tube and ceiling level diffuser assembly;

2. complying with the International Code Council ICC AC-16; and

3. minimum tube diameter will be 530mm.

7.8.4.6 Interior Glazing

(a) General Requirements

(i) Provide interior glazing in locations and quantities to meet the intent of the building principles related to maximization of Natural Light, daylight, views, meaningful ties between the interior and the exterior and visual connections between interior spaces for supervision.

(ii) Interior glazing will be laminated safety glass and fire-rated where required.

(iii) Except for glazing in wood doors, glazing will be in pressed steel frames to same requirements as door frames.

(iv) Interior glazing sill heights and sidelights will be a minimum 200 mm height above finished floor. Sidelight head height to match adjacent door.

(v) Where not specified, size, configure, and adequately construct windows to suit rooms that require Natural Light, views and/or natural ventilation.

(vi) Coordinate glazing heights with adjacent wall protection, handrails, and other accessories to achieve functional and aesthetic cohesiveness.

(b) Performance Criteria

(i) Interior glazing will:

1. be conventional commercial grade window construction; and

2. provide normal security and resistance to abuse.

(ii) Interior Glazing Selection Criteria

1. All windows will be able to be re-glazed in place.

(iii) Interior Glazing Schedule

1. Doors & Borrowed lites: minimum 6mm tempered and as required to maintain overall wall acoustic requirements.

2. Exit and corridor doors: 6mm tempered.

7.9 Division 9 – Finishes

7.9.1 Basic Requirements

7.9.1.1 Select the appearance of finishes and colours to create and promote a calm and respectful environment, prevent glare, and minimize artificial lighting requirements**.**

7.9.1.2 Final selections for finish colours will be approved by the Owner.

7.9.1.3 Custom colors and finishes are not to be used.

7.9.1.4 Materials and assemblies will be designed and constructed to minimize maintenance requirements.

7.9.1.5 In areas where finishes and systems of installation will occur and water is anticipated to be present as part of cleaning or other procedures, allow water to collect and exit without causing damage to the finishes or substrate.

7.9.1.6 In areas where finishes or systems of installation may come in contact with water, chemical agents or other liquids as part of cleaning or other

procedures, water, chemical agents or other liquids will be allowed to collect and exist without causing damage to the finishes or substrate.

7.9.1.7 Interior finish materials will 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.

7.9.1.8 Interior materials will be of a high performance quality to withstand regular and repeated abuse and cleaning.

7.9.1.9 Interior materials subject to corrosion from exposure to moisture or other corrosive agents and where painting is insufficient to protect from corrosion/damage will receive a special protective coating sufficient to protect against corrosion. Such materials include interior masonry in Shower, structural and miscellaneous steel and galvanized steel.

7.9.1.10 Provide acoustic wall treatment as required to meet the acoustic requirements specified in Appendix 1C - Acoustical Chart and Section 8.3.6.2 (Acoustical Treatment) of this SOR.

7.9.2 Interior Walls and Partitions

7.9.2.1 Basic Requirements:

(a) Design and construct the interior components of the Building in accordance with the following:

(i) provide acoustic separations as required to account for the specific functions to be carried out in the relevant spaces affected as specified.

(ii) design and select interior walls and partitions, partition systems and interior finishes:

1. for ease of cleaning and maintenance;

2. to maximize permanence and durability, including impact resistance;

3. to maximize flexibility and adaptability of services;

4. with low VOC emissions so as to minimize adverse impact on indoor air quality and indoor environmental quality;

5. to meet acoustic requirements as specified .to accommodate required building services without compromising security and safety.

(b) Use of steel framing

(i) Interior wall framing will comply with all applicable Standards,

including the Canadian Sheet Steel Building Institute Standards (CSSB1) and the Association of Wall and Ceiling Contractors of B.C. (AWCC) Wall & Ceiling Specification Standards Manual for materials and workmanship for interior walls, including steel studs and furring and GWB ceiling suspension systems.

(ii) Use prefabricated non-load bearing steel studs for interior partitions and furring with no axial load other than its own weight, the weight of attached finishes, and lateral loads of interior pressure differences and seismic loads.

(iii) Construct steel stud framing to accommodate electrical, plumbing and other services in the partition cavity, and to support fixtures, wall cabinets, and other such wall-mounted items. Provide reinforcement and backing.

(iv) Account for in 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.

(v) Design assembly to accommodate construction tolerances, deflection of building structural members, and clearances of intended opening.

(vi) Where GWB systems are required to provide fire resistance ratings, design wall assemblies tested by fire testing laboratories acceptable to Authorities Having Jurisdiction.

7.9.2.2 Performance Criteria

(a) The interior walls will be designed and constructed to provide a safe and secure place for Occupants and provide the required level of fire rated protection stipulated by the BCBC.

(b) Materials and work quality for interior walls, including steel studs and furring and GWB ceiling suspension systems, will be to Good Industry Practice. Non-load bearing channel stud framing will comply to ASTM C 645 and CAN/CGSB-7.1-98.

(c) Interior walls and partitions system design and components will meet the seismic restraint requirements of the BCBC.

(d) The interior walls and partition systems will provide acoustic separations of internal walls and partitions.All walls will be constructed floor to underside of structure above.

(e) Interior walls will be designed and constructed using durable materials and will be secured in a fashion.

7.9.3 Wall Finishes

7.9.3.1 General Requirements

(a) Refer to Appendix 1B, Room Data Sheets.

(b) Provide wear-resistant, low maintenance wall finishes appropriate for various uses of the interior spaces; use of double layer of gypsum board is not permitted. In areas prone to wear, provide birch panel to door height.

(c) Painted concrete or painted concrete masonry is an acceptable finish in storage rooms.

(d) Wall coverings are not permitted.

(e) Use systems from the single manufacturer and dye lot etc. to suit performance level required and selected from readily available stock.

(f) Paint all gypsum board surfaces. Concrete and concrete masonry surfaces will be filled.

(g) For MDF and gypsum board surfaced wall assemblies, provide a 100 mm high (x thickness of wall finishes) strip of pressure treated fir plywood at the wall/floor interface except where gypsum wall board is required to meet fire rating of wall assembly.

(h) Provide solid wood backing in all frame walls for solid connection to all room fixtures and equipment including chalkboards, tackboards, monitors. Minimum backing will be 19 mm fir plywood. Final locations will be reviewed with the Owner prior to covering.

7.9.3.2 Performance Criteria

(a) Gypsum board:

(i) Gypsum board work to CSA A82.31 except when specified otherwise.

(ii) Gypsum board: to CSA A82.27M, Type X, 15.9 mm is minimum standard.

(iii) Finish gypsum board in accordance with the Levels of Finish as prescribed in Section 9.6 of the AWCC manual as follows:

1. Level 1 finish: use for completely hidden areas including under plywood wall protection.
2. Level 2 finish: use in storage and service areas.
3. Level 4 finish: use for areas receiving eggshell or semi-gloss finish.

(b) Ceramic and Porcelain Tilework:

(i) Ceramic tiles will be applied on walls only.

(ii) Porcelain tiles will be applied to floors only.

(iii) Dynamic Coefficient of Friction (DCFO) will be minimum:

1. 0.55-0.56 for outdoor applications; and

2. 0.42 for indoor Public Spaces.

(iv) Ceramic tilework will comply with all applicable Standards, including the Terrazzo Tile and Marble Association of Canada (TTMAC) Specification Guide 09 30 13 Tile Installation Manual.

(v) For installations on wet and exterior surfaces, use floor tiles that have the following static coefficients of friction as per the American Society for Testing and Materials International (ASTM):

1. Level Surfaces: Not less than 0.50 for wet and dry conditions.

2. Stair Treads: Not less than 0.60 for wet and dry conditions.

3. Ramp Surfaces: Not less than 0.60 for wet and dry conditions.

(vi) For exterior installations, provide frost-resistant exterior tiles with a moisture absorption rating of 3.0% or less.

(vii) Provide control joints and expansion joints in compliance with the recommendations of the TTMAC Tile Installation Manual.

(viii) Provide crack isolation membranes to resist crack transmission from the substrate due to lateral movement; design for use in thin-set applications of tile over a cracked substrate. Use elastomeric sheets or trowel-applied materials suitable for subsequent bonding of ceramic tile.

(ix) Set ceramic tile with latex modified mortar and all grout will be epoxy based.

(x) Fix tiles with low toxicity cement. Grout will be of a colour complementary to the tiles and easily maintained. White grout will not be used.

(xi) Ceramic tile will be CAN-75.1 M77, Type 5, class MR4, minimum 108 x 108 x 6.4 mm size, cushioned edges, glazed pattern, colour as approved by the Owner.

(xii) Cementitious backer board:

1. will be used instead of gypsum board (except where Gypsum board is required for fire rating) over studs in wet areas. Install backer boards in accordance with the manufacturer's written instructions to the full height of the tiling or other wall finish. Protect the substrate 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. Cementitious backer board will be:

a. Rigid lightweight concrete board;

b. Glass fibre reinforcing mesh each face;

c. Thickness: 16mm; and

d. Dimensions: Largest practical sheets to minimize joints.

(xiii) Tilework:

1. Wall tiles to TTMAC detail 200-5-B. Floor tiles to TTMAC detail 200-15.

(c) Plywood paneling:

(i) to CSA 0115, 11mm thick plain sliced veneer face, veneer core, good one side, NAAWS Custom Grade, warehouse matched, Select White Birch, for clear finish.

(d) Medium density fibreboard paneling:

(i) to ANSI A208.2; 12.5 minimum, for paint finish. Flame spread rating less than 150.

(e) Acoustic wall panels:

(i) Requirements:

1. composite wood fibre bonded with cement binders such as Tectum Panels; or

2. semi rigid fibre glass with hardened edges and wrapped in an acoustic transparent vinyl fabric.

(ii) Cementitious wood fibre acoustic units:

1. to CAN/ULC-S706-09, Type: 2, Class: 4, Grade: 1
2. Standard units: 1213 mm wide, thickness as required for NRC requirements (minimum 38 mm), bevel, edged, standard white, NRC designation of 0.40. Flame-spread rating of 25, smoke developed 50 or less. Adhesive: type recommended by acoustic unit manufacturer.

7.9.4 Wall Protection and Wall Coverings

7.9.4.1 Wood Feature Wall

(a) Solid or veneered wood, meeting smoke / fire rating requirements as required.

(b) If open jointed wood systems will be used, a black fabric backer will be used to conceal services / structure behind.

7.9.4.2 Vinyl Acrylic Wall Covering

(a) Where vinyl/acrylic wall covering is used, provide vinyl/acrylic high impact rigid sheet, minimum 15mm thickness with colour-matched vinyl/acrylic trim for joint/transitions.

(b) Furnish complete packaged system containing all primers and adhesive. Use water-based and non-hazardous primer and adhesive materials.

7.9.4.3 Dry Erase Wall Covering

(a) Provide pigmented gloss vinyl wall covering presentation surfaces for dry erase markers, including .61 kg/m2, non-woven backing as specified.

(b) Provide trim and other accessories including wall covering trim of anodized aluminum, low profile trim.

(c) For the rooms having whiteboards; the Design-Builder will provide either a whiteboard or dry erase wall covering will be determined pursuant to the Review Procedure.

7.9.4.4 Interior Window Film

(a) General: 4.7mil vinyl, frosted;

(b) Apply to inner face of glazing. Edges will not be captured within window stops to enable replacement of film as necessary; and

(c) Privacy film: 50% opacity to obscure recognition of interior / exterior features.

7.9.4.5 Wall Protection

(a) Provide white birch plywood protection on all walls and exposed corners within corridors to prevent damage due to impact from Occupant traffic.

(b) Apply sheet wall protection and bumper guards in other locations where the there is a potential for impact damage.

(c) Minimum wall protection height is 2220 mm (door height) above the floor.

(d) Wall protection will continue above any handrail/wall bumper to fully protect the wall from damage.

(e) Applied Sheet Wall Protection

(i) Sheet wall protection will be:

1. PVC free;

2. Fire and smoke performance: Class A per CAN/ULC-S102.1; and

3. Smooth or minimally textured without visual fasteners.

(ii) Colour to compliment or match surrounding wall colour.

(f) Corner Guards

(i) Provide 50mm x 50mm x 1220mm (to match height to top of typical wall protection) 18ga stainless steel corner guards at all outside corners where wall finishes are exposed to wear conditions.

(ii) To be installed over finish, not with flange beneath finish to allow for future replacement.

(iii) To be tamper proof.

7.9.5 Painting

7.9.5.1 General Requirements

(a) Materials containing lead or mercury are not permitted.

(b) Paints and coatings will meet the applicable flame spread requirements of applicable governmental authorities and the BCBC.

(c) Use only materials having a minimum MPI 'Environmental Friendly' E2 rating or better based on VOC (EPA Method 24) content levels.

(d) If seamless epoxy wall coatings are used, provide a two component, high solids, zero or low VOC, solvent free, epoxy glaze wall coating which will be seamless, abrasion and chemical resistant, and UV resistant. Coatings will have been tested in accordance with ASTM D1308-Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.

(e) All interior and exterior painting and decorating work will be in accordance with MPI Painting Manual premium grade requirements and will be inspected by the local MPI Accredited Quality Assurance Association's Paint Inspection Agency. The Design-Builder is responsible for the cost for such inspections, and for either the local MPI Accredited Quality Assurance Association's Guarantee, or the Maintenance Bond.

(f) Unless noted otherwise, walls and exposed ceilings will be painted throughout with High Performance Architectural Latex.

(i) Paint Gloss: Paint gloss is defined as the sheen rating of applied paint, in accordance with the following values:

1. Gloss Level 1: Flat or matte: max. 5 units @ 60 degrees to a maximum of 10 units @ 85 degrees. NOT PERMITTED;

2. Gloss Level 2: High Sheen Flat (Velvet-like): max. 10 units @ 60 degrees to a maximum of 10 - 35 units @ 85 degrees. NOT PERMITTED;

3. Gloss Level 3: Eggshell: max. 10 - 25 units @ 60 degrees to a maximum of 10 – 35 units @ 85 degrees. LIMIT USE TO ADMIN OFFICE AND CEILINGS;

4. Gloss Level 4: Satin-like Finish: max. 20 - 35 units @ 60 degrees to a minimum of 35 units @ 85 degrees.
5. Gloss Level 5: Semi-gloss Finish: max. 35 - 70 units @ 60 degrees. doors and frames and other interior metal work, exposed structure;

6. Gloss Level 6: Gloss Finish: max. 70 - 85 units @ 60 degrees. NOT PERMITTED; and

7. Gloss Level 7: High Gloss Finish: More than 85 units @ 60 degrees. NOT PERMITTED.

(g) Painting systems will comply to Table 7.9.5.1-1.

Table 7.9.5.1-1

Interior Material	**MPI Finish System**
Concrete vertical surfaces	INT 3.1C High Performance Architectural Latex
Concrete floors - sealed	INT 3.2F Concrete floor sealer
Concrete Masonry	INT 4.2D High Performance Architectural Latex
Glue Laminated Beams and Columns	INT 6.1F W.B Acrylic, clear
MDF, and wood paneling - opaque	INT 6.4S High Performance Architectural Latex
MDF, wood paneling and trim	INT 6.3Q W.B. Acrylic, Clear
Miscellaneous high contact metal and steel components such as hand railings	INT 5.1E Alkyd
Structural steel such as web joists	INT 5.1C W.B. Dry Fall G5 Semi-Gloss Note: two finish coats required.
Steel piping such as fire sprinkler and gas lines	INT 5.1T Alkyd (over surface tolerant primer)
galvanized metal such as Q-Decks , ductwork	INT 5.3H W.B. Dry Fall
Metal doors and frames	INT 5.3K W.B. Light Industrial Coating (over w.b. primer)
Wood doors	INT 6.3Q W.B. Acrylic , Clear
Gypsum Board	INT 9.2B High Performance Architectural Latex
Exterior Material	**MPI Finish System**

Concrete	EXT 3.1C W.B. Light Industrial Coating
Concrete masonry	EXT 4.2C W.B. Light Industrial Coating
Structural steel such as web joists	EXT 5.1B W.B. Light Industrial Coating (over inorganic zinc)
Miscellaneous high contact metal and steel components such as hand railings	EXT 5.1L Polyurethane (pigmented) over inorganic zinc rich primer and high build epoxy.
Galvanized metal such as Q-Decks	EXT 5.3J W.B. Light Industrial Coating (over w.b. primer)
Metal doors and frames	EXT 5.3J W.B. Light Industrial Coating (over w.b. primer)
Glue Laminated Beams and Columns	EXT 6.1H Polyurethane, Clear, 2 component.

(h) All interior and exterior painted concrete surfaces will be sand-blasted and primed to ensure proper finish adhesion. All cast-in-place or precast concrete to receive abrasive blasting within 25-72 hours after concrete is poured, depending on curing requirements. The Design-Builder will designate minimum 10 square metre sample panel complete with finish for Owner review and acceptance prior to proceeding first coat.

(i) All exposed exterior structural and architectural steel will be sandblasted to the appropriate MPI requirements for the finish system.

(j) Use exterior paints of a quality designed to protect substrate materials from weather and climate conditions.

(k) Colour palette will be selected from a single manufacturer and approved by the Owner.

(l) Provide line painting for exterior parking and traffic areas, and other exterior miscellaneous hard surface playing areas.

(m) Paint all piping and conduit exposed to view in all spaces except in mechanical rooms with the following exceptions: fire-sprinkler piping in mechanical rooms will be painted red and gas piping in mechanical rooms will be painted yellow.

(n) Ensure O&M Manuals include a complete colour & product schedule.

(o) Achieve a visually harmonious and aesthetically coordinated appearance across all areas of the Building.

(p) Use exterior and interior finish materials with surface finishes either as integral to the finish material or field-applied separately to the surface of the finish material.

(q) Treat exterior masonry materials such as brick and concrete block with water-repellent coatings to prevent water ingress into or

through the material.

(r) Paint handrails, doors, and frames with a contrasting colour from walls in consideration of the visually impaired.

7.9.6 Ceilings

7.9.6.1 General Requirements

(a) Refer to Appendix 1B – Room Data Sheets for ceiling finish and height requirements.

(b) Provide compatible finishes and select from readily available stock.

(c) Ceiling reflectance will complement the lighting design.

(d) All ceiling systems and ceiling finishes will:

(i) provide permanence and durability.

(ii) comply with the specified acoustic requirements. promote ease of cleaning and maintenance in order to minimize disruption.

(iii) be compatible with mechanical, plumbing, electrical, building security and communications and ESCS services and fixtures.

(iv) be compatible with ceiling attached equipment; and

(v) be suitable for the function of the space.

(e) All ceiling systems and ceiling finishes will comply with the following:

(i) fire and smoke separation and fire resistance ratings will comply to the requirements of the BCBC.

(ii) suspended ceilings will comply with seismic resistance as required by all applicable codes; and

(iii) requirements of the Specification Standards Manual as published by the Association of Wall and Ceiling Contractors of British Columbia (AWCC).

(f) Provide feature ceiling accents:

(i) Either acoustic baffles or linear / geometrics wood feature ceilings.

7.9.6.2 Performance Criteria

(a) Suspended Acoustic T-Bar Ceiling:

(i) Ceiling tiles will be used as specified in Appendix 1B - Room Data Sheets.

(ii) Acoustic Panel: Non-directional, white ceiling panel, trim edge detail to fit a standard T-bar grid panel size.

(iii) Provide accessibility to the ceiling spaces where access is required to mechanical, electrical or other service systems.

(iv) Provide acoustical panels that are appropriate for the normal occupancy condition range and maximum 70% relative humidity. When the service use temperature and relative humidity are expected to exceed these ranges, use acoustical units specifically designed for such applications.

(v) Use tiles with scratch-resistant surfaces in any area where lay-in ceiling panels frequently need to be removed for plenum access.

(vi) Interior sound levels will be controlled to facilitate a comfortable environment for Occupants and a safe working environment for staff.

(vii) Acoustic ceiling tiles in a suspension system will be installed to provide the levels of sound attenuation to suit the intended function of the room.Ceilings installed in Kitchens and any Washrooms will be capable of being cleaned without wear.

(viii) Suspension system:

1. Completed suspension system to support superimposed loads. Maximum deflection of suspended acoustical ceiling assembly: 1/360th of span to ASTM C635 deflection test.

2. Intermediate duty system to ASTM C635, commercial quality cold rolled steel. Type 1 suspension system: non-fire rated one-directional exposed 19 mm T-Bar grid. Die cut components with interlocking connections. Exposed T-bar grid components to have pre-finished satin sheen. Hanger wire: galvanized soft annealed steel wire to diameter required by loading.

(ix) Accessories:

1. Hanger isolator: 25 mm minimum with rated loads and spring selection in accordance with manufacturer's design tables.

2. Acoustic insulation: sound attenuation blankets as required to meet STC or NRC "Noise Stop” Requirements.

3. Access doors: panels of bonderized steel, prime painted, 1.519 mm thick frame, 97 mm thick door, flush door hinge design.

(x) Edge Trim where suspended ceiling system is separated from adjacent walls: Aluminum vertical edge trim systems will be

compatible with suspension system.

(xi) Acoustic tile:

1. Mineral fibre, non-directional, with a minimum NRC of 50-55 and CAC 30-34 (ASTM E84). Light Reflective LR-1, rated Class 25 (non-combustible) under Flame Spread Index Section of Federal Specifications SS-S-118a, Class 1 Flame Spread Rating to ASTM E84 (Tunnel Test Method). Labeled and listed by Underwriter's Laboratory Inc. or ULC for a Flame Spread of 0-25 under the Hazard Classification, CAN/ULC-S102-10, Standard Method of Test for Surface Burning Characteristics of building Materials and Assemblies.

(xii) Vinyl-faced acoustic tile:

1. Mineral fibre, non-directional, with a minimum NRC of 50-55 and CAC 30-34 (ASTM E84). Light Reflective LR-1, rated Class 25 (non-combustible) under Flame Spread Index Section of Federal Specifications SS-S-118a, Class 1 Flame Spread Rating to ASTM E84 (Tunnel Test Method). Labeled and listed by Underwriter's Laboratory Inc. or ULC for a Flame Spread of 0-25 under the Hazard Classification, CAN/ULC-S102-10, Standard Method of Test for Surface Burning Characteristics of building Materials and Assemblies.

(xiii) ACT - Acoustic Ceiling Tile – Midgrade

1. Material: Mineral fiber with acoustically transparent membrane.
2. Finish: Smooth Finish.
3. Size: 24” x 24” x 1” or larger.
4. Edge: Square Tegular.
5. Grid: 15/16 or 9/16”.
6. Colour: White.
7. NRC: 0.85 or greater.
8. Light Reflectance: 0.86 or greater (per ASTM E1477).
9. Anti-Mold/Mildew coating.
10. Fire Performance: ASTM E84 and CAN/ULC S102 – Flame Spread.
11. Index 25 or Less.

12. Sag Resistance: High.

13. Recycled Content: 75% or higher.

(xiv) ACTT - Acoustic Ceiling Tile - Top grade

1. Material: Mineral fiber with acoustically transparent membrane.

2. Finish: Smooth Finish.

3. Size: 24” x 60” x 1” or larger.

4. Edge: Square Tegular.

5. Grid: 9/16”.

6. Colour: White.

7. NRC: 0.85 or greater.

8. Light Reflectance: 0.86 or greater (per ASTM E1477).

9. Anti-Mold/Mildew coating.

10. Fire Performance: ASTM E84 and CAN/ULC S102 – Flame Spread.

11. Index 25 or Less.

12. Sag Resistance: High.

13. Recycled Content: 75% or higher.

(xv) ACTH - Acoustic Ceiling Tile - High STC

1. Material: Mineral fiber with acoustically transparent membrane.

2. Finish: Smooth Finish.

3. Size: 24” x 24” x 1” or larger.

4. Edge: Square Tegular.

5. Grid: 15/16 or 9/16”.

6. Colour: White.

7. NRC: 0.95 or greater.

8. Light Reflectance: 0.86 or greater (per ASTM E1477).

9. Anti-Mold/Mildew coating.

10. Fire Performance: ASTM E84 and CAN/ULC S102 –

Flame Spread.

11. Index 25 or Less.

12. Sag Resistance: High.

13. Recycled Content: 75% or higher.

(xvi) ACTC - Acoustic Ceiling Tile – Cleanable

1. Material: Mineral fiber with mylar surface.

2. Finish: Smooth finish.

3. Size: 24” x 24” or larger.

4. Edge: Captured in grid.

5. Grid: As appropriate for ceiling system.

6. Colour: White.

7. NRC: 0.50 or greater.

8. Anti-Mold/Mildew Coating.

9. Fire Performance: ASTM E84 and CAN/ULC S102 – Flame Spread Index 25 or Less.

10. Sag Resistance: High.

(b) Suspended Gypsum Board Ceiling:

(i) Suspension system:

1. Completed suspension system to support superimposed loads. Maximum deflection of suspended gypsum board ceiling assembly: 1/360th of span to ASSTM C645 deflection test.

(ii) Main runners will be cold formed steel channels, protected with rust inhibited coating not less than 38 mm 12.7 mm x 1.37 mm thickness. Cross furring will be hot shaped furring channels. Inserts will be able to develop full-strength of hangers, suitable for attachments to surfaces where required. Hander wire: galvanized soft annealed steel wire to diameter required by loading.

(iii) Accessories:

1. Access doors: panels of bonderized steel, prime painted, 1.519 mm thick frame, 1.897 mm thick door, flush door hinge design.

2. Screws to ASTM C646.

3. Stud adhesives to CGSB-1 GP-25M.

(iv) Gypsum board:

1. Gypsum board to CSA A82.27, Type X, 16 mm thick x 1218 mm wide x maximum practical length, ends cut square, edges tapered, with round edge to internal finishes.

2. Finish gypsum board in accordance with the Levels of Finish as prescribed in Section 9.6 of the AWCC manual as follows:

   a. Level 1 finish: use for completely hidden areas; and

   b. Level 4 finish: use for areas receiving paint Semi-Gloss Level 3 & 5.

3. Paint in accordance with Section 7.9.5.

(v) Wood Ceilings:

a. Wood panel systems.

b. Linear wood ceilings.

c. Solid or veneered wood, meeting smoke / fire rating requirements as required.

d. Acoustics: NRC 0.35 minimum.

e. Independently hang ceilings from structure.

f. If open jointed wood systems will be used, an integral black fabric backer will be used to conceal services / structure above.

7.9.7 Floor Finishes

7.9.7.1 General Requirements

(a) Refer to Appendix 1B, Room Data Sheets.
(b) Provide floor and finishes that are compatible and consistent one another and suit the level of finish and performance required.

(c) The floor and floor systems will be complementary and integral to the functional and aesthetic requirements of the interior space.

(d) Use systems from the single manufacturer and dye lot to suit performance level required and selected from readily available stock.

(e) Floor systems will not be installed on any floors until the conditions as required by the manufacturer's recommendation for that particular floor system have been achieved. The Design-Builder will provide testing result to the Owner to verify that the appropriate

moisture levels and conditions required by the manufacturer have been achieved prior to flooring installation.

(f) Provide a flooring solution that uses colour and pattern changes to break-up large expanses of areas, helps to define zones, and creates a visually interesting spaces.

(g) Floor finishes will be used where required for one or more of the following reasons:

(i) protect the structural floor from wear or corrosion;

(ii) provide an attractive appearance; or

(iii) for the comfort and safety of the user.

(h) Floor finishes will be slip resistant in both wet and dry conditions.

(i) Where epoxy flooring is used in wet areas, use water and slip-resistant grade and prevent water or moisture transmission to the substrate. Terminate flooring at the walls in the form of 150mm high flash coved bases. Above 150mm high flash cove, taper flooring material to allow smooth transition of the wall protection over the flooring.

(j) Use permanent, heavy-duty integral materials such as seamless quartz epoxy flooring in areas subject to moisture and heat over extended periods of time.

(k) The transition between epoxy flooring and sheet wall protection will be smooth. The wall protection will overlap the flooring.

(l) Use water resistant and slip-resistant flooring in all washrooms.

(m) Use anti-static flooring materials for MTRs and TRs.

7.9.7.2 Flooring Preparation

(a) Provide self leveling, cementitious underlayment for interior finish flooring.

(b) Verify concrete has been properly cured for at least 28 days and is dry. Perform moisture test outlined in, ASTM D4263. Proceed with installation only after substrates do not exceed a maximum moisture-vapor-emission rate of 3 lbs. of water/ per 1000 sq. ft. (1.36 kg of water/100 sq. m) in 24 hours prior to underlayment installation.

(c) Wood or Concrete substrate shall be structurally sound, properly fastened, and dry. Contractor shall clean subfloor to remove mud, oil, grease, and other contaminating factors before arrival of the authorized applicator.

(d) Wood substrate:

(i) Limit design of subfloor and framing to a minimum L/360

(ii) Wood should be APA rated T&G or back blocked at joints.

(e) Underlayment mix shall be tested for a slump using a 2” (i.d.) x 4” cylinder resulting in a patty size of 8 ½”-9 1/2”.

(f) At least one set of three molded cube samples shall be taken from each day’s pour or every 10,000 square feet whichever is less during the underlayment application. Cube shall be tested in accordance with ASTM C472.

(g) Product compatibility: Manufacturers of underlayment and finished flooring system certify in writing that products are compatible.

7.9.7.3 Performance Criteria

(a) Resilient Sheet flooring:

(i) Comply to ASTM F2034 Type I to minimum gauge 2.45 mm (.096").

(ii) Weld seams using approved products to manufacturer’s directions. Welded seams to run parallel to longest wall space.

(iii) Arrange sheets to ensure fewest seams.

(iv) Standard: Comply with Specification Standards Manual published by NFCA (National Floor Covering Association).

(v) Linoleum sheet flooring will have a homogenous core of primarily natural materials, consisting of linseed oil, wood flour, and resin binders mixed and calendared onto a natural jute backing. Weld all seams.

(vi) Rubber flooring will be solid cushioned sheet or tile formulated with 100% virgin elastomers, reinforcing agents, soil-resisting agents, and migrating waxes compounded to create durability, excellent cleaning characteristics, and 0.08 dry coefficient of friction and defined by ASTM D204. Stud designs to have chamfered edges with a sharply-defined edge at the top for higher slip resistance, easier cleaning, superior maintenance and low vibration design to minimize vibration and noise.

(vii) Heat weld all seams.

(viii) Finish flooring with high speed buffing as per manufacturer’s operational specifications. Do not apply sealer or wax.

(b) Slip Resistant Sheet flooring:

(i) Slip-resistant sheet flooring will have a static coefficient of friction of not less than 0.6 on level surfaces and not less than 0.8 on ramps.

(ii) Comply to ASTM F1913 to minimum gauge 2.00 mm (.080").

(iii) Weld seams using approved products to manufacturer’s directions. Welded seams to run parallel to longest wall space.

(iv) Arrange sheets to ensure fewest seams.

(c) Polished Concrete:

(i) Steel trowel finish: to CSA CAN3-A23.1 with a final finish to suit covering or treatment as per Appendix 1B - Room Data Sheets.

(ii) The use of any exposed concrete flooring will comply to the levels of finish as defined by the Concrete Polishing Council. Refer to the Concrete Polishing Council's Polished Concrete Appearance Chart link below and comply to the following minimum levels of finish:

https://curecrete.com/wp-content/uploads/CPC-Aggregate-Exposure-Chart.jpg

LEVEL	NAME	DISTINCTNESS-OF-IMAGE (DOI) GLOSS	IMAGE CLARITY VALUE, %
1	Flat (Ground)	Images of objects being reflected have a flat appearance.	0 – 9
2	Satin (Honed)	Images of objects being reflected have a matte appearance.	10 – 39
3	Polished	Images of objects being reflected do not have a sharp and crisp appearance but can be easily identified.	40 – 69
4	Highly Polished	Images of objects being reflected have a sharp and crisp appearance as would be seen in a near-mirror like reflection. May require grouting.	70 – 100

Haze Index <10

1. Class A: Cement Fines

2. The level of sheen will be Level 2 – satin or Level 3 – polished, with a Class B – fine aggregate or Class C – medium aggregate exposure Sealed Concrete.

(iii) Concrete Stain:

1. Subcontractors used to install/apply concrete stains will have minimum 10 years verified experience in the installation of concrete floor treatment finishes.

2. Moisture: Ensure concrete substrate is within moisture

limits prescribed by flooring manufacturer prior to applying.

3. Quality of products and workmanship: In accordance with the Specification Standards Manual as published by the National Floor Covering Association [NFCA].

4. Manufacturer's Technical Representative: The Design-Builder will cause the flooring manufacturer to provide a technical representative to inspect the surfaces to which a flooring treatment will be applied to confirm that the substrate is acceptable for the application of flooring treatment. The Design-Builder will cause the manufacturer's technical representative to carry out regular Site inspections to ensure that the installation is carried out in accordance with manufacturer's installation instructions and that deficiencies are corrected.

(d) Porcelain tile:

(i) Will meet the performance standard of the Terrazzo Tile & Marble Association of Canada, c/o the Ceramic Tile Design-Builder's and Industry Association of B.C.

(ii) Fix with low toxicity cement. Grout colour should complement that of the tiles, and be easily maintained. White grout will not be used.

(iii) Porcelain floor tile: cushioned edges, matte finish, with matching coved base and other special shapes as required. The Owner will approve colours.

(iv) Where used on floors, porcelain tile will have a slip coefficient rating of ≥ 0.42or higher.

(i) Rubber Sheet Flooring:

(i) System Description: Heat-welded Rubber Sheet flooring system.

1. Subfloor: Concrete subfloor will be waterproofed beneath the slab and at perimeter walls and on the earth side of below-grade walls. No curing agents or sealers will be applied to the concrete slab.

(ii) Product: 3 mm thick x 1500 mm wide heat-welded rubber sheet flooring system installed according to manufacturer's specifications. Colour selection as approved by the Owner.

(iii) Sheet rubber, prefabricated, calendared and vulcanized

1. Unbacked Rubber Sheet Floor Covering: ASTM F 1859.

2. Rubber Sheet Floor Covering with Backing: ASTM F 1860.

3. Make transitions between two adjoining areas, new-to-new, flush.

(e) Stair Coverings

(i) Provide tactile warning strips and stair nosings to assist the visually impaired complying with ISO/FDIS 23599 Assistive Products for the Blind & Vision-Impaired, Canadian Standards Assoc. N551-12,.

(ii) Abrasive Stair Nosings: Provide slip-resistant stair and landing nosings complying to ASTM D 2047): ≥ 0.5 SCOF.

(f) Rubber Stairs:

(i) Commercial grade.

(ii) Treads: heavy duty, diamond pattern, 6 mm thick, square nose.

(iii) Risers and stringers: sheet rubber material to match rubber base.

(iv) Tactile warning strips: 3 mm thick, 1000 mm x 1000 mm tile.

(g) Carpet Tiles

(i) Use carpet tile that is certified under Canadian Carpet Institute/Canadian Rug Institute (CCI/CRI) Indoor Air Quality Program and having CRI/IAQ Label.

(ii) Use a carpet tile designed to accept wheelchair traffic.

(iii) Static Level: Maximum 3.5 kV static generation at 21ºC and 20% relative humidity per AATCC-134, throughout life of product.

(iv) Emissions: Maximum 0.5 mg/m2/hr TVOC, after installation per Carpet and Rug Institute CRI Green Label Plus™ Indoor Air Quality Carpet Testing Program.

(v) Provide non-solvent, non-toxic, odorless adhesive that, when installed, maintains an acceptable VOC concentration and emission rate. Carpet tile cannot have a PVC backer.

(vi) Carpet tiles will:

1. be 100% solution dyed nylon;

2. have minimum Tarr rating of 3.0;

3. have CRI green label plus for carpet tile and adhesive;

4. have non-PVC backing; and

5. have a minimum 10 year wear, stain, structural integrity and delamination warranty.

(h) Wood Flooring (Gymnasium)

(i) Composite wood, plywood and agrifibre products including core materials, must contain no added urea-formaldehyde resins. Adhesives used to fabricate laminated assemblies containing these products must contain no urea-formaldehyde.

(ii) Hard maple flooring: unfinished 25/32" x 2 ¼" wide MFMA graded 1st or better. Ride-on sanding equipment is not to be used for the gymnasium floors and chatter marks will not be accepted.

(iii) Resilient Pads: 19mm cavity molded rubber pads. Install to plywood as supplied by floor system manufacturer.

(iv) Nails: purpose designed barbed nails for power nailing. 50 mm long as recommended by manufacturer.

(v) Sheathing plywood: to CSA 0151-M1978 sheathing grade, 12.7 mm thick.

(vi) Membrane: 0.15 mm thick polyethylene film to CGSB 70-GP-1a, type 2.

(vii) Staples: as recommended for plywood subfloor installation.

(viii) Base: molded rubber, 75 x 100 mm angle profile, with 10 mm diameter ventilation holes, black colour.

(ix) Floor finish: MFMA Approved Group 5 waterbased system including 3 coats sealer, 2 coats of finish (5 coats).

(x) Game Lines: shall be painted in accordance with the game lines plan. Paints shall be waterborne, manufactured by finish manufacturer and part of finish system with warranty.

(xi) Approved Systems:

1. Action Thrust Floor System by Action Floor Systems.
2. Neoshok Specialty Hardwood System by Connor Sports.
3. Bio-Cushion Classic by Robbins

7.9.8 Base

7.9.8.1 Performance Criteria

(a) Coved rubber base:

(i) Rubber base will be commercial grade, top set coved, 3 mm thick, 100 mm high. Colour will be approved by the Owner.

(b) Porcelain tile coved base:

(i) To match floor tile.

(ii) Include special tile shapes to satisfy corner condition and inside corner conditions.

(c) Provide bullnose top where there is no wall tile above. Ventilated molded rubber base:

(i) As supplied by floor manufacturer.

(ii) All wood floors to have ventilated rubber or wood base.

(d) Wood Base:

(i) Kiln dried (KD), sanded 4 sides (S4S) Birch or other hardwood, 19x100, Clear Finish.

7.9.9 Guardrails

7.9.9.1 General Requirements

(a) Guardrails at stairs, landings and openings in floors will be constructed of glass panels.

(i) Vertical pickets are acceptable at Shop mezzanines and egress stairs only.

7.9.10 Acoustic Treatment

7.9.10.1 General Requirements

(a) Provide absorptive and/or reflective materials to instruction spaces to provide acceptable acoustic conditions for instruction.

(b) Select acoustic treatment to have appropriate impact and wear resistance for each intended location.

(c) The Design-Builder is responsible for any remedial work required to meet specified minimum standard See Appendix 1C.

7.10 Division 10 – Specialties

7.10.1 Signage

7.10.1.1 Interior Signage

(a) General Requirements

(i) The user consultation process will be used to confirm all room names, numbering systems and similar supporting signage.

(ii) Room numbering, signage and drawings / documentations are to utilize matching numbering for purposes of as-built

documents, maintenance manuals, fire safety plans and equipment labeling.

(iii) All Building signage will provide identification, information and assist in wayfinding and orientation.

(iv) Include name and number plates for each room entry door.

(v) Include accessibility signage for all rooms with accessible features.

(vi) Interior signage will be designed and constructed such that no signage materials can be removed by the students.

(vii) Interior signage will be designed to provide direction for Occupants, and to inform students of rules.

(viii) Washroom signage will have male and female international symbols including international accessibility symbol, GN washrooms will have appropriate signage.

(ix) Provide a schedule showing type, configuration, numbering and wording for all rooms. Schedule will be submitted for approval by the Owner. The Design-Builder to coordinate room numbering with mechanical and electrical equipment numbering and labeling.

(x) The detailed requirements for signage language/terminology will be determined pursuant to the user consultation process and Review Procedure.

(xi) Provide a simple configuration of the Building circulation systems and functions so that way finding is inherently easy for members of the public who are not familiar with the Building.

(xii) Design the internal directional signs to include:

1. installation of signage at each point at which a directional decision is required.

2. using consistent terminology with consistent and predictable locations of signage.

3. signage will identify every space in the building and all directional information. Where required, additional braille language will be provided as determined in consultation with the Owner.

4. signage required at each stairwell level; and final signage wording will be determined pursuant to the Review Procedure.

(xiii) Coordinate final locations of all interior signage to satisfy Building operational requirements.

(b) Performance Criteria

(i) Name and number plates will be cast acrylic, with screen-printed numbers or symbols, sandwich paneled units with integral slots.

(ii) All School and NLC rooms are to have a room number or a room name. That name or number will be on a sign 100mm high, length to suit. Numbers will be agreed to with the Owner. Room names will be in Indigenous language, where relevant, English and French, with exact names determined in consultation with the Owner.

(iii) Teaching spaces will receive a teacher's name sign with exchangeable paper inserts. These will be 50mm high, 250mm long.

(iv) All interior doors will receive a 'lamacoid' label on the door header that identifies the adjacent room using a four digit numbering system. Those room numbers will be the same numbers that were used throughout the Drawings and the Specifications. Labels will be 25mm high, 75mm long.

(v) Pictogram signs will be provided for those spaces where and as required by code. Style to match other signage.

(vi) Mounting methods and locations will be specified for different situations. Provide mounting methods and locations schedule.

(vii) Tactile braille language will be provided on all room signage.

7.10.1.2 Exterior Signage

(a) General Requirements

(i) Exterior signage will be required to clearly identify the following: Main and secondary entries, bus entries and exits, bus zones, TED Compound access, vehicular entries, parking areas, dedicated NLC parking, accessible parking stalls, emergency vehicle parking, smoke and vape free campus signage, surveillance notice, loading areas, drop-off areas and no stopping areas and all exterior loading and service areas for the Facility.

(ii) Use universal symbols and graphics.

(b) Performance Criteria

(i) School Name Sign:

1. Provide name sign with location and design will be approved by the Owner, in minimum 300 mm high letters, with street address in minimum 200 mm high letters, and the Owner's logo to the Owner's standards and approval.

2. Reference construction:

a. Cast aluminum letters and numbers in anodized finish, with school name installed in a location as approved by the Owner.

3. Design will be submitted for approval by the Owner.

7.10.2 Room Dividers

7.10.2.1 Performance Criteria

(a) Operable Solid Partition:

(i) Steel, paired hinged panels, manually operated, expandable jamb closure.
Finish: primed and painted steel face panel.

(b) Glass Wall Partition:

(i) Sliding aluminum top suspended glass wall partitions.

(ii) Manually operated.

7.10.3 Washroom Accessories:

7.10.3.1 General Requirements

(a) Refer to Appendix 1B, Room Data Sheets

(b) Install washroom accessories in all washrooms of the Building. Determine the type, size, and number of accessories with regard for the numbers and categories of users.

(c) Use accessories free from imperfections in manufacture and finish.

(d) Shower curtains will be on breakaway track or breakaway rod as appropriate.

(e) Coat hooks will be anti-ligature.

7.10.3.2 Performance Criteria

(a) Flat mirrors:

(i) Install continuous mirror of 6 mm select polished float glass complete with stainless steel frame for full width of wall above lavatories in Washrooms.

(ii) Mirror to extend from top of back splash or 100mm above wall mounted vanities to minimum of 2 metres above finished floor level.

(iii) Electrical fixtures and other wall mounted fixtures are not to be installed through the mirrors.

(iv) Provide specialty products manufactured for the specific purposes intended and installed in accordance with the

manufacturer's directions.

(v) For full wall unframed mirrors, use 6mm thick minimum float glass backed with electrolytically-applied copper plating. Grind smooth and polish all edges.

(vi) For wall mounted posture mirrors, use framed type; one piece, stainless steel channel frame with a No. 1 quality, 6mm thick float glass mirror backed with electrolytically applied copper plating. Back with galvanized steel.

(vii) Safety glazing is required in all washroom areas. Apply laminate to back of mirror. Tempered glass is not permitted.

(b) Grab bars:

(i) Stainless steel, exposed screw attachment beneath escutcheon plate. Will withstand pull of 2.2 kN minimum in any direction.

(c) Tilt-up shower grab bar:

(i) Stainless steel, exposed screw attachment beneath escutcheon plate. Will withstand pull of 2.2 kN minimum in any direction.

(ii) Design will prevent grab bar from falling back down to full horizontal position once grab bar is raised more than 45 degrees from horizontal position.

(d) Hand Dryers:

(i) Hard-wired, heated with touchless control. Surface-mounted style. Die-cast zinc alloy or stainless steel body. Sound level not to exceed 75db on highest setting. Velocity to be adjustable, with minimum velocity of 13,000LFM. HEPA filter.

(e) Shower Curtain:

(i) Opaque anti-bacterial nylon reinforced vinyl shower curtain in widths to suit shower stalls, complete with hooks, hold back hood and chain.

(ii) Shower curtains will be anti-ligature.

(f) Paper towel dispenser:

(i) Touchless operation, hard-wired. Roll dispenser, to be coordinated with the Owner's standards.

(ii) Provide blocking and coordinate locations with the Owner.

(g) Shower Rod:

(i) Stainless steel tube of required length, 25 mm diameter with satin chrome finished flanges. Commercial grade. Shower rod

and anchorage to withstand a downward pull of 0.9 kN.

(ii) Curtain rods will be anti-ligature.

(h) Shower Seat in accessible shower stall:

(i) Folding shower seat with solid plastic laminated slats secured to frame with stainless steel bolts and nuts. Set size: 876 mm x 559 mm.

(ii) Frame 18-8 type 304 stainless steel tubing. Commercial grade. Complete with all mounting flanges.

(i) Install and provide adequate space and backing for the following accessories supplied by the Owner:

(i) Toilet paper dispensers: At every toilet.

(ii) Soap dispensers: At every washroom, minimum 1 per every 2 lavatories.

(iii) Refuse containers: Provide adequate space in every washroom.

(iv) Sanitary Napkin Disposal: Provide at all single GN washrooms and gender specific washrooms (Female).

7.10.4 Washroom Walls and Partitions:

7.10.4.1 Walls in Gender Neutral washrooms be full height, insulated walls complete with solid doors and door hardware (including indicator)

7.10.4.2 Partitions in gender specific washrooms will be solid partitions or manufactured toilet partitions.

(a) Performance Criteria (manufactured toilet partitions):

(i) Sheet steel:

1. Commercial grade, stretcher leveled sheet steel to ASTM A526-71 [1975] with G 90 zinc coating to ANSI/ASTM A525-70. Minimum base steel thickness: 0.1 Panels and doors: 0.8 mm 0.2 Pilasters: 0.9 mm 0.3 Reinforcement: 3.0 mm 0.4 Head rails: 1.0 mm Stainless steel sheet: To ASTM A-666-72 1979 type 3.6 with No. 4 finish.

(ii) Attachment:

1. Stainless steel tamperproof type screws and bolts.

(iii) Hardware:

1. Hinges: continuous hinge running full height of door. Stainless steel, satin finish, 1.6 mm (16 ga.) self-closing.

2. Latch set:

   a. surface mounted, extra-heavy-duty institutional sliding door latch with shock-resistant nylon track, one-piece 4.4 mm (8 ga.) stainless steel keeper.

3. Wall and connecting brackets:

   a. chrome casting or anodized aluminum extrusion.

4. Bumper, chrome plated, non ferrous.

5. Door pull: chrome plated, non ferrous, institutional grade

6. Hinges: continuous institutional grade hinge running full height of door. Chrome plated, non ferrous, 1.6 mm (16 ga.) self-closing.

7. Hook: chrome plated, non ferrous, institutional grade, anti-ligature

(iv) Doors and panels:

1. 25 mm overall minimum thickness; 22 ga. sheet steel with welded seams, faces bonded using waterproof thermal setting adhesive to honeycomb core, minimum 610 mm wide x 1473 mm high for standard compartment.

(v) Pilasters:

1. Minimum 32 mm thick, 1830 mm high, constructed same as door.

(vi) Head rails:

1. Extruded Aluminum 25 x 41 mm. w/6063-T5 finish clear anodized.

(vii) Pilaster shoes:

1. 75 mm high, die formed stainless steel.

(viii) Provide internal reinforcement at areas of attached hardware and fittings.

7.10.5 Shower Partitions:

7.10.5.1 Performance Criteria

(a) Materials:

(i) Partitions between shower and change compartments will be tiled solid walls.

(ii) Shower change area doors will be solid phenolic melamine H.D.

(b) Hardware:

(i) Hinges: continuous institutional grade hinge running full height of door. Stainless steel, satin finish, 1.6 mm (16 ga.) self-closing.

(ii) Latch set: surface-mounted extra-heavy-duty institutional sliding door latch with shock-resistant nylon track, one-piece 4.4 mm (8 ga.) stainless steel keeper.

7.10.6 Whiteboards:

7.10.6.1 Performance Criteria

(a) Whiteboard:

(i) semi-gloss white porcelain enameled 24 gauge. Steel, laminated to 11.1 mm fiberboard with 0.04 mm minimum sheet aluminum backing sheet;

(ii) provide whiteboards with full width extruded aluminum frames, accessory trays, paper holder, map-rails and map-hooks;

(iii) use non-toxic, water based lamination adhesive for whiteboards;

(iv) will be manufactured for the specific purposes intended and installed in accordance with the manufacturer's directions;

(v) will be sized appropriately for purpose; and

(vi) Surface Finish: For use with dry-erase markers wipe clean with dry cloth or standard eraser, and suitable for use as a projection screen.

(b) Tackboards:

(i) vinyl fabric laminated to 14.3 mm fiberboard. Panels will be UL certified flame with spread rating not exceeding 75.

(c) Vinyl faced fiberboard panels:

(i) vinyl fabric, laminated to 14.3 mm fiberboard with long edges wrapped for butt jointing. Panel size 1220 mm high x length required. Panels will be UL certified with flame spread rating not exceeding 75. Colors will be approved by the Owner.

(d) Perimeter trim:

(i) extruded anodized aluminum channel weight 280 g/m minimum.

(e) Pen-tray:

(i) extruded anodized aluminum section with rounded ends,

weight 446 g/m minimum.

(f) Map hook and Paper holder:

(i) extruded aluminum section. Supply and install one hook for each 600mm of map rail.

(g) Horizontal or vertical sliding whiteboards:

(i) sliding panels in tubular aluminum frames, 50 mm x 100 mm for installation on millwork items. Whiteboards will be suspended from track with adjustable roller assemblies and be complete with a continuous aluminum chalk-rail and cover over top mounted track.

(h) Screws: countersunk.

(i) Adhesives: as recommended by manufacturer.

7.10.7 Bicycle Storage

7.10.7.1 Provide both long term and short term bicycle storage (minimum 20):

(a) Bicycle racks will be institutional, exterior grade, stainless steel, fixed to concrete pad with tamper proof fasteners.

7.11 Division 11 – Equipment

7.11.1 Appliances

7.11.1.1 Refer to Appendix 1 F

7.11.2 Maintenance Manuals:

7.11.2.1 Supply operating and maintenance instructions, including spare parts list and optional accessories for all items specified within this SOR in accordance with this Agreement.

7.11.2.2 Identify each item, arranged in sequence and ensure the numbers correspond to the specifications and drawings.

7.11.2.3 Provide an itemized lead sheet at the front of the manual with a list of the contents and the name and phone number of the 24/7 available local service providers.

7.11.3 Gymnasium equipment:

7.11.3.1 General Requirements

(a) For full-sized courts in the Gymnasium and for backstops on wall with bleachers, provide:

(i) Ceiling-mounted retractable basketball backstops and goals: heavy duty squared steel tubing frame, electric operation, regulation size glass rectangular board to full-size courts, regulation size solid arced board to cross courts, with

regulation size goal of 15.9 mm diameter round steel, painted with orange enamel, and heavy duty nylon net. 3.05 metres above floor.

(ii) Basketball backstops that comply to the following:

1. Glass and breakaway goal and padding, meeting the following requirements:

a. ceiling suspended backboards will be motor operated units;

b. wall mounted backboards will be foldaway units manually operated; and

c. product: Viking Alexander Metal Products Ltd or acceptable equivalent.

2. Side swing basketball backstops will be equipped with heavy duty squared steel tubing fame.

3. Provide seismic cable stays complete with pulleys.

a. Product will be Viking Alexander Metal Products Ltd. Model Sandy B #140 or acceptable equivalent; and provide backboard mounted to backstop with adjustable frame which allows adjustment of goal height from 2.4 to 3.0 metres above floor.

(b) Cross courts except as noted above:

(i) wall-mounted retractable basketball backstops and goals: heavy duty squared steel tubing frame. Solid arced board, regulation size, with regulation size goal of 15.9 mm diameter round steel, painted with orange enamel, and heavy duty nylon net. 3.05 metres above floor, manual operation.

(c) Floor sockets:

(i) cast bronze, machined, post socket with anchor projections and bronze cap, 1 7/8” for badminton, 3 ½” for Volleyball, suitable for installation in applicable floor system. Provide equal number of sockets in equipment storage room floor.

(d) Provide 2 sets of volleyball posts and nets, 6 sets badminton posts and nets matching the sockets for secondary school sports.

(e) Provide AV system. Refer to 8.8.14.

7.11.4 Bleachers

7.11.4.1 Performance Criteria:

(a) Retractable bleacher seating

(i) Provide telescopic platforms designed to support and resist, in addition to their own weight, the following minimum forces:

1. Uniform live load; 7.7 kN per metre;

2. Parallel sway load; 350 N per metre; and

3. Perpendicular sway load; 146 N per metre.

(b) Cause the seating supplier to submit an engineering report signed by a Professional Engineer involved in the design and fabrication of telescopic seating.

(c) All structural connections will be made with S.A.E. stress related bolts and self-locking nuts. The use of self-topping screws, or bolts locking nuts, is not acceptable.

(d) Submit shop drawings and product data, including detailed plans and sections and details indicating construction, connections, propulsion system, and installation requirements for review and approval by the Owner.

(e) Provide full operation and maintenance instructions and manuals in accordance with this Agreement.

(f) System description:

(i) Telescopic bleacher system will be comprised of multiple tiered, closed deck seating rows. Bleachers to operate on the telescopic principle, stacking vertically in minimal floor area when not in use.

(ii) First moving row will be secured with both friction and mechanical locks. All other rows will be mechanically locked, operable only upon unlocking and cycling of first row. Each bleacher row will be comprised of risers, deck components and a complete set of supportive columns and braces.

(iii) The operating system will incorporate a lock system permitting the discretionary securement of one, several, or all rows in use or stacked position.

(iv) Dimensional and physical characteristics of the bleachers and the seating plan will be in accordance with all applicable codes, the specifications and approved drawings.

(g) Accessories:

(i) provide guards and rails as required for safety and to meet applicable codes. Supply and install non-slip adhesive backed abrasive tread surfaces to intermediate aisles.

(h) Propulsion:

(i) Furnish and install integral power operator controlled by removable pendant control unit plugging into front of seating bank.

(i) Closed-deck telescoping bleachers, wall attached type, 303 mm rise

x 609 mm run, complete with heavy duty understructure & seat modules, 457 mm long x 305 deep unitized interlocking plastic modules or alternate as approved by the Owner in advance.

7.11.5 Outdoor basketball court:

7.11.5.1 Performance Criteria:

(a) The outdoor 18m x 12m outdoor basketball court will include pole-mounted basketball backstops and goals: heavy duty round arced galvanized steel tubing frame, regulation size rectangular board with regulation size goal of 15.9 mm diameter round steel, painted with orange enamel, and heavy duty nylon net. 3.05 metres above court.

7.11.6 Metal Lockers

7.11.6.1 General Requirements

(a) Provide and install a minimum of 1200 lockers within the School. Lockers are to be half height.

(b) Half height lockers may either be stacked or non-stacked.

(c) Where stacked lockers are not recessed into walls or do not have a bulkhead above them, sloped locker tops are required.

(d) Non-stacked banks of half height lockers are to incorporate a millwork countertop above the lockers. The sides of the ends of rows of lockers will be completed with millwork or half-height walls with edge protection.

7.11.6.2 Performance Criteria

(a) Bodies:

(i) Fabricated from minimum 0.61 mm cold rolled steel. Back and sides will be provided with continuous lock forming, running the complete height of the locker. Door frame will be minimum1.4 mm formed steel channel, welded for a one piece construction, complete with heavy duty padlock hasp.

(ii) Hinges: two 1.8 mm 5 knuckle hinges for each door.

(b) Doors:

(i) outer panel 1.5 mm cold rolled steel, inner panel 0.91 mm cold rolled steel. Sandwich panel construction fully welded with vent louvers and complete with honeycomb core for strength and sound proofing. Door complete with recessed handle box to accept locking device and two rubber bumpers.

(c) Include chrome plated, flush inset handle box, and black plastic number plates with white numbers inset in finger pull. Numbering plan will be approved by the Owner.

(d) Accessories:

(i) Provide 1 shelf and 2 coat hooks in each tier of full height lockers.

(ii) Provide 1 coat hook in each half height locker.

(iii) Equip lockers with 3.1 mm thick cold rolled steel padlock hasp.

(iv) Provide metal trim, and finished end panels except where recessed into walls or finished with millwork end panels.

(v) Provide rubber door bumpers.

(e) Finish: two coats high quality alkyd baked enamel.

(f) Locker Size:

(i) Type 1: Half height, 381mm W x 381 mm D x 914 mm H.

(ii) Type 2: Full height, 305mm W x 457mm D x 1524 mm H.

(iii) Type 3: 1/3-sized, 305mm W x 381mm D x 610mm H.

(g) Base: Provide 100 mm plywood base platform on raised framing to all lockers.

7.11.7 Fume Hood Cabinets

7.11.7.1 Performance Criteria

(a) Product: CSA Approved, ATFH double sided with rear panel containing a smooth sliding counterbalanced sash with 6 mm (1/4") tempered safety glass, 1220 mm wide, in stainless steel front stiles and airfoils. Face velocity 100fpm. Fume hood will be lockable from both sides.

7.12 Division 12 – Furnishings

7.12.1 Window Coverings:

7.12.1.1 General Requirements

(a) Window coverings (to be provided in all classooms and offices) will allow control of exterior light entering the room during daylight hours and provide privacy during daylight and non-daylight hours.

(b) Window coverings will be fully coordinated and complementary with the interior design concept for their respective functional areas.

(c) Use shading fabric of non-PVC or vinyl-coated polyester or fiberglass yarn that is waterproof, washable, rot-proof, flame-

resistant, colourfast to light, glare-reducing, and able to control heat gain while providing external visibility.

(d) Roller Blinds:

(i) Manually operated roller shade system:

1. Standard roll-shade complete with fascia, clear anodized finish, Stainless steel chains complete with child-safe chain retainers to the Owner's approval.

(ii) Electrically operated blinds or roller shade system is required for all high windows above 3048 mm.

(iii) Where used, roller shades systems will operate with a spring wrap mechanism, adjustment - free continuous qualified #10 nickel-plated brass ball chain (50-lb. test) and pulley clutch operating system. System will be chain operated with spring assist when required to reduce pull force to lift heavy or large shades. Fabric will be inherently anti-static, flame retardant, fade and stain resistant, light filtering, room darkening, & blackout fabrics providing 0% - 3% openness factors. Fabric weight 320g/m2 containing fiberglass, polyester, acrylic or vinyl laminates.

(e) Shading Cloth

(i) Cloth will be waterproof, washable, rot proof, flame resistant, fungal and bacteria resistant, colourfast to light and will control heat gain and provide external visibility and reduction of glare.

(ii) Cloth will be selected to suit design criteria for room and solar control and will be:

1. visually transparent single-fabric; and

2. room darkening shadecloth.

(f) Shade Bands

(i) Construction of shade band includes the fabric, the enclosed hem weight, shade roller tube, and the attachment of the shade band to the roller tube. Sewn hems and open hem pockets are not permitted.

(ii) Fabrication

1. Fabricate shadecloth to hang flat without buckling or distortion. Fabricate with heat-sealed trimmed edges to hang straight without curling or ravelling. Fabricate unguided shadecloth to roll true and straight without shifting sideways more than 3.0mm in either direction per 2440mm of shade height due to warp distortion or weave design. Fabricate as follows:

a. provide battens in standard shades as required to assure proper tracking and uniform rolling of the shadebands;

b. for railroaded shadebands, provide seams in railroaded multi-width shadebands as required to meet size requirements and in accordance with seam;

c. provide battens for railroaded shades when width-to-height [W:H] ratios meet or exceed manufacturer's standards; and

d. blackout shadebands, when used in side channels, will have horizontally mounted, roll-formed stainless steel or tempered-steel battens not more than 915mm on center extending fully into the side channels.

(g) Not In Use

7.13 Division 14 - Conveying Equipment

7.13.1 Elevator

7.13.1.1 General Requirements

(a) Provide a single cab elevator to be used as transport for Occupants including Occupants with disabilities or health issues and transportation of furnishings and/or equipment.

(b) Elevator operational functions will be programmable by the Owner, integrated with the Building Management System and have to ability provide local control when enabled by a card reader, key fob or key.

(c) The elevator will be serviceable by non-proprietary service company.

(d) There will be no access to elevator shafts other than as required for maintenance.

(e) The elevator sumps will remain dry under all conditions.

(f) The elevator will have a fail-safe phone.

(g) Durable elevator cab finishes (including stainless steel fronts as well as hand and bumper rails) will be provided. Finishes will be reviewed and approved in advance by the Owner as part of consultation with the Owner.

(i) Finish: Plastic laminate or stainless steel cab with stainless steel buttons and moving blankets. Flooring will be non-slip rubber sheet.

(h) Elevator machine design will not require lubrication after installation.

Provide battery lowering operation of each elevator such that when the loss of normal power is detected, the battery lowering feature is activated. When normal power becomes available, the elevator will automatically resume operation.

(i) The elevator will serve all accessible floor levels. Access to roof is

not required.

7.13.1.2 Performance Criteria

(a) The elevator will have a minimum load capacity of 1,134kg and a vertical speed of no less than 0.75 metres per second (m/s).

(b) Codes, by-laws, and regulations:

(i) Provide equipment and perform work in accordance with:

1. CAN/CSA B44-07, Safety Code for Elevators and Escalators

2. , and CSA B44.1; and

3. CSA-C22.1 - Canadian Electrical Code, Part 1, Safety Standards for Electrical Installations.

4. ASME A17.1 Safety Code for Elevators and Escalators, latest edition or as required by the local building code.

(ii) The elevator will comply with equipment noise Section 8.3.6.2 of this SOR and Appendix 1C - Acoustical Chart.

(c) Seismic requirements:

(i) Elevator system will withstand the effects of earthquake motions determined according to CAN/CSA S832.

(ii) Comply with Section 8.4 [Elevator Safety Requirements for Seismic Risk Zone applicable to the Building, or greater in ASME A17.1/CSA B44 Safety Code for Elevators and Escalators.

(d) Platform size:

(i) minimum 2,108 mm wide x 1524 mm deep; and

(ii) suitable for wheelchair and stretcher access and use and compliant with BCBC requirements.

(e) Elevator door location will be oriented for entry to the side to accommodate regular transport of motorized floor cleaning equipment and a stretcher.

(f) Operation: Elevator requires key switch & fob operation; return to ground function and PA system connection.

Part 8 Facilities Services

8.1 Division 19 – Geoexchange Ground Heat Exchanger (GHX)

8.1.1 Design and Installation Principles

8.1.1.1 General Design and Installation Principles

(a) Design and install the GHX in conformance with ANSI/CSA C448 SERIES-16 - Design and Installation of Ground Source Heat Pump Systems for Commercial and Residential Buildings as a minimum standard (or updated version when it is released). Where specific more rigorous requirements are indicated in the Statement of Requirements, meet the more rigorous requirement.

(b) Design and install the GHX in conformance with the BC Water Sustainability Act (WSA) and the Groundwater Protection Regulation (GPR) authorized under the WSA.

(c) Design and Install the GHX to meet the mechanical HVAC performance requirements stipulated in Division 23 Statement of Requirements and in a manner that results in satisfying energy performance requirements described in Schedule 8 Energy.

(d) Design and install the GHX in accordance with all other applicable regulations, codes, bylaws and ordinances, including safety considerations (particularly relating to trench excavation and heavy equipment operation).

8.1.1.2 Performance Principles

(a) Design and install the GHX as a vertical borehole GHX type of system. Account for the Site conditions including the data identified in the Thermal Property Test Report - George Pringle January 23, 2023.

(b) Design and install the GHX system so that the boreholes are grouped in zones with equal numbers of boreholes in each zone and piped in a fully balanced reverse-return arrangement.

(i) Arrange the boreholes so that each individual group of boreholes represents no more than 20% of the total boreholes (i.e., minimum five groups of boreholes).

(ii) Configure the manifolding arrangement so that zone groups can be isolated from the remainder of the GHX, and the remainder of the borehole groups can be circulated and functional while one or more groups are isolated.

(c) Design and install the GHX to avoid reliance on circuit setter valves for balancing GHX fluid flow.

(d) Design and install the GHX to be inherently balanced with equal circulation path lengths.

(e) Design and install the GHX with an emphasis on maintaining the long-term integrity of the GHX piping.

(i) Before burying the GHX piping, conduct comprehensive pressure testing and segment flow testing of all GHX pipe segments to assure that the GHX piping securely holds pressure and that each segment conducts flow without unexpected flow restriction.

(ii) Consider the use of non-invasive flow measurement device (such as ultrasonic flowmeter) for verifying unrestricted flow in all parallel branches of the GHX system.

(f) Because most of the GHX infrastructure is buried and concealed from view after construction completion, carefully record as-built information, including accurate and complete position survey of all buried infrastructure, record of construction details for all features of the installation, results of testing, and commissioning information.

8.1.2 Qualifications

8.1.2.1 Basic Requirements

(a) Designer Qualifications

(i) Demonstrate training certification applicable for designing commercial/institutional scale GHX systems such as Certified Geothermal Designer (CGD) designation from International Ground Source Heat Pump Association (IGSHPA), or functional equivalent.

(b) Driller and Grouting Certifications

(i) Ensure borehole drilling and grouting activities are carried out under the direct supervision of a BC registered Qualified Well Driller (QWD) per Province of BC groundwater protection requirements.

(c) GHX Piping Installation Qualifications

(i) Demonstrate training certification applicable for installing commercial/institutional scale GHX systems such as IGSHPA commercial installer training.

(d) High Density Polyethylene Tubing Heat Fusion Welding

(i) Ensure only qualified and experienced persons perform heat fusion joining of piping. Qualifications may include heat fusion certification such as provided by International Ground Source Heat Pump Association (IGSHPA), HDPE pipe manufacturer, or fusion equipment manufacturer.

8.1.3 GHX Simulation Modeling

8.1.3.1 Basic Requirements

(a) Use GHX computer modelling software that meets relevant requirements described in ANSI/CSA C448 SERIES-16 - Design and Installation of Ground Source Heat Pump Systems for

Commercial and Residential Buildings.

(b) Maintain records of simulation software inputs and outputs and submit as Shop Drawing Submittal 19 00 10. Include the following information in the submittal:

(i) Software used in the GHX simulation, including the software developer and version number used.

(ii) Peak heating and cooling loads and long-term (monthly/annual) heating and cooling energy used in the simulations.

(iii) Ground thermal properties used in simulations.

(iv) Borehole size and layout characteristics including the borehole diameter, spacing separation between boreholes, and borehole layout grid pattern used in simulations.

(v) Borehole completion characteristics including the diameter size and type of the heat exchange tubing, the type of borehole grout including mix ratio and thermal conductivity, and the borehole grout, and any thermal enhancements accounted for the borehole grout in the simulations.

(vi) Type of antifreeze and concentration used in the simulations.

(vii) Minimum heating season ground loop fluid temperature and maximum cooling season ground loop fluid temperature used in the simulations.

(viii) GHX flowrate accounted for.

(ix) Computational period (number of seasons) used in the simulations.

(x) Software simulation output printout.

8.1.3.2 Performance Requirements

(a) Use the following input parameters in GHX simulations:

(i) Site-specific soil and bedrock thermal properties as documented in the Thermal Property Test Report - George Pringle January 23, 2023.

(ii) Winter design-day minimum entering water temperature from GHX to heat pump: -1.1 °C (30.0 °F)

(iii) Summer design-day maximum entering water temperature from GHX to heat pump: 32.2°C (90.0 °F)

(iv) Coefficient of performance (COP) for heat pump at -1.1 °C (30.0 °F) winter design-day entering water temperature from GHX to heat pump per heat pump manufacturer,

1. Ensure COP is not less than 3.1 at this design condition.

(v) Energy Efficiency Ratio (EER) for heat pump at 32.2°C (90.0 °F) summer design day entering water temperature from GHX to heat pump per heat pump manufacturer.

1. Ensure that EER is not less than 13.1 at this design condition.

(vi) GHX heat exchange fluid selected to be 20% volume concentration propylene glycol.

(vii) Flow in borehole heat exchanger tubing during peak heating or cooling load situations is sufficient to meet Reynold's Number of 2500 or higher.

(viii) Accurate representation of bore-to-bore separation spacing and size and shape of borehole grid array.

(ix) Accurate representation of the borehole completion information including drilled diameter, borehole grout characteristics, and heat exchanger tubing characteristics.

8.1.4 Heating and Cooling Capacity Requirements for GHX Design Basis

8.1.4.1 Performance Requirements

(a) Heating Delivery Capacity from Geoexchange Ground Heat Exchanger (GHX) System

(i) GHX to be adequately sized to provide peak heating delivery and annual heating delivery capacity from geoexchange GHX system sufficient to meet Schedule 8 energy performance requirements, and all performance requirements described in the Statement of Requirements.

(b) Cooling Rejection Capacity to Geoexchange GHX System

(i) Peak cooling rejection and annual cooling rejection capacity of the geoexchange GHX system:

1. Sufficient for the GHX to receive 100% of the peak and the annual rejected cooling load from the conditioned space (including the compressor heat component from the geoexchange heat pumps).
2. Sufficient to avoid auxiliary cooling rejection systems such as a cooling tower or other auxiliary cooling rejection systems (i.e., all cooling heat rejection is to be conveyed to the GHX).
3. Sufficient to meet Schedule 8 energy performance requirements and all performance requirements described in the Statement of Requirements.

(c) Graphical Representation of Peak and Annual Heating and Cooling Building Loads Served by the Geoexchange Heat Pump System

(i) Provide a heating and cooling load duration plot as output from the building energy model in a form similar to the format

shown below, so that the plot represents the peak and annual heating and cooling demands of the building.

(ii) On the load duration plot clearly indicate the portion of the peak and annual heating demand served by the geoexchange heat pump system.

(iii) Additionally, on the load duration plot provide indication that 100% of the peak cooling load and 100% of the annual cooling demand will be serviced by the geoexchange system (with 100% of the cooling rejection heat rejected to the GHX).

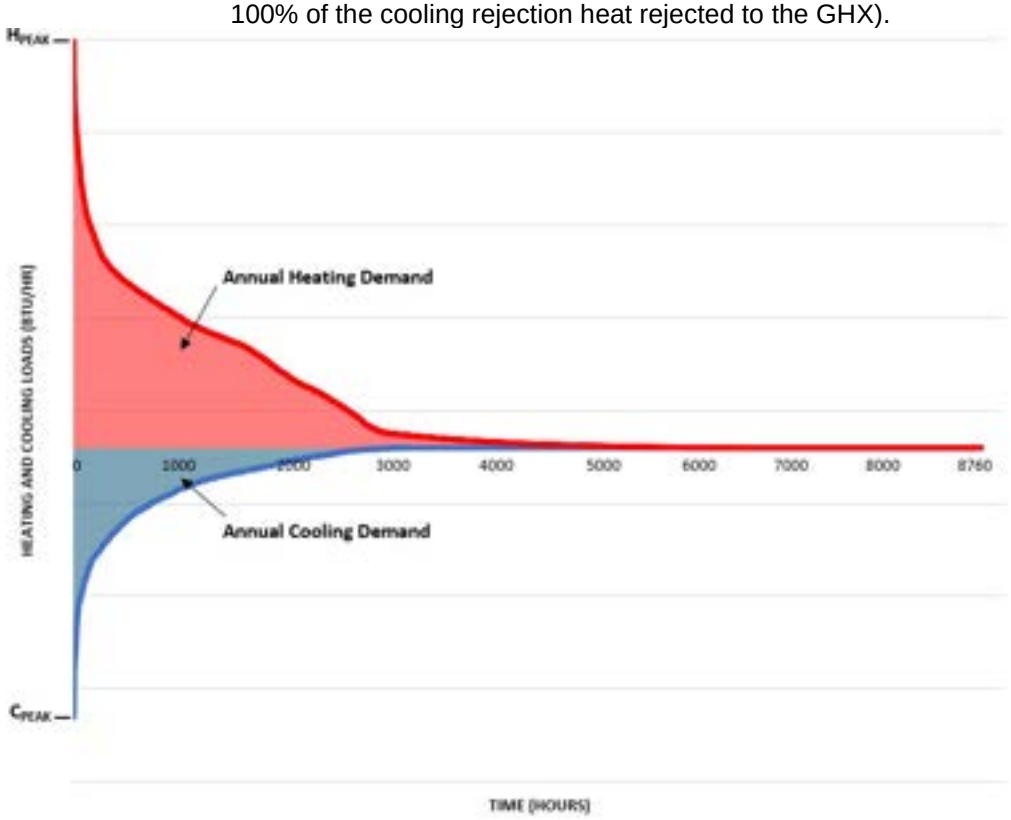

Figure 1. Sample Heating/Cooling Load Duration Plot

8.1.5 Environmental Protection

8.1.5.1 Basic Requirements

(a) Ensure design and installation conforms with all aspects of BC Water Sustainability Act and regulations including the BC Groundwater Protection Regulation authorized under the Act.

(b) Ensure conformance with all other relevant environmental protection regulations, codes, bylaws, and ordinances.

8.1.5.2 Performance Requirements

(a) Ensure no offsite migration of groundwater, drill fluids, or other fluids or slurries occurs.

(b) Exercise measures to manage risks relating to potential flowing

artesian groundwater conditions. In the event such conditions are encountered, the Design Builder has responsibility to stop the flow, per BC Water Sustainability Act and associated regulations.

8.1.6 Borehole Drilling

8.1.6.1 Performance Requirements

(a) Several types of drilling methods are commonly used for geoexchange installation. Select a suitable method for the Site conditions.

(b) Environmental regulations require that borehole drilling is carried out under the direction of a BC Ministry of Environment Qualified Well Driller (QWD). Ensure that a certified QWD is on the project site in a site supervision capacity during drilling activities.

(c) Ensure boreholes are plumb and spaced adequately to reduce risk of crossed borehole paths.

(d) Avoid drilling techniques that cause over-excavating the borehole diameter that can result in reduced heat exchange performance.

(e) Ensure heat exchange loop tubing is verified to be installed to the full target depth of each borehole.

(i) Measure the completed installation with a weighted tape to confirm.

(f) Conduct quality assurance / quality control measures to ensure that the heat exchange loop piping is installed in a manner that protects the integrity of the piping.

(i) Avoid installation methods that may cause kinking of the tubing, scoring of the tubing, or that may lead to other types of potential tubing compromise.

8.1.7 Borehole Heat Exchange Loop Tubing

8.1.7.1 Basic Requirements

(a) Meet the relevant borehole tubing material requirements described in ANSI/CSA C448 SERIES-16 - Design and Installation of Ground Source Heat Pump Systems for Commercial and Residential Buildings.

(b) Use DR11 as a minimum tubing wall thickness.

8.1.8 Borehole Grouting

8.1.8.1 Basic Requirements

(a) Meet the relevant grouting material and placement requirements described in ANSI/CSA C448 SERIES-16 - Design and Installation of Ground Source Heat Pump Systems for Commercial and Residential Buildings.

(b) Environmental regulations require that borehole grouting activities are carried out under the direction of BC Ministry of a Environment Qualified Well Driller (QWD). Ensure that a certified QWD is on the project site in a site supervision capacity during grout placement activities.

(c) For environmental protection and heat exchange performance, design and construct the geoexchange boreholes with continuous column of borehole grout carefully installed from the bottom of the boreholes upward by tremie-pipe pressurized installation method.

(d) Ensure the grout meets a 48-hour setup permeability of 1.0 x 10-7 cm/sec (or lower)

8.1.8.2 Performance Requirements

(a) As an environmental protection measure, design and construct the boreholes so that no vertical migration of groundwater occurs along the boreholes.

(b) Consider the benefits of thermal enhancement of the grout product, though the enhancement shall not compromise meeting the minimum setup permeability requirement.

8.1.9 Ground Heat Exchanger (GHX) Collection and Distribution Piping

8.1.9.1 Basic Requirements

(a) Meet requirements for high density polyethylene (HDPE) pipe described in relevant sections of ANSI/CSA C448 SERIES-16 - Design and Installation of Ground Source Heat Pump Systems for Commercial and Residential Buildings.

(b) Use only heat fusion welding methods for joining HDPE pipe. Do not use mechanical fittings.

(c) Ensure only qualified and experienced persons perform heat fusion joining of piping. Qualifications shall include heat fusion certification such as provided by International Ground Source Heat Pump Association (IGSHPA), HDPE pipe manufacturer, or fusion equipment manufacturer.

8.1.9.2 Performance Requirements

(a) Design and install the GHX to avoid reliance on circuit setter valves for balancing GHX fluid flow. Design and install the GHX to be inherently balanced with equal circulation path lengths (in a manner such as shown in Appendix 1G).

(b) Design and install GHX collection and distribution piping to have low head loss.

(c) Design and install the GHX collection and distribution piping configuration so that it can be efficiently flushed and purged, such as illustrated in Appendix 1G.

8.1.10 Flushing and Purging

8.1.10.1 Basic Requirements

(a) Flush the GHX to introduce clean water to the GHX piping and to remove foreign debris and silt from the GHX so that the ground loop contains only clean water.

(b) Following flushing, purge the GHX to remove air from ground loop piping.

(c) Conduct flushing and purging before burying the collection/distribution pipe so that water flow testing and hydrostatic pressure testing is conducted before the piping is buried.

(d) Flowrate and Pressure Requirements:

(i) Use a minimum purge flow criterion of 0.8 m/s (2.66 ft/sec) through all branches of the GHX piping network.

(ii) Use caution during the purging process to avoid exceeding the pressure rating of the loop pipe.

(e) Pumping Apparatus:

(i) Use a pumping apparatus that conforms in concept with the descriptions of such an apparatus described in Closed-Loop/Ground Source Heat Pump Systems – Installation Guide, International Ground Source Heat Pump Association, 1988.

(ii) Ensure the apparatus has a reservoir open to the atmosphere and the intake for the pump draws from a filtered intake at the bottom of the reservoir. Ensure that the return flow from the ground loop enters the top of the reservoir. Debris flushed from the piping will be trapped in the filter and air purged from the piping will escape from the open top of the reservoir. Ensure that the filter can be cleaned easily during the procedure, so it doesn't clog up and restrict flow.

(iii) Equip the pumping apparatus with reliable gauges to indicate pressure and equip the flushing/purging apparatus with a reliable flowmeter to confirm flowrates.

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(f) Flushing Duration:

(i) Flush for a sufficient duration until clean water with no foreign material and no turbidity is present in the ground loop.

(g) Purge Duration:

(i) Purge for a total period of at least 2 hours for GHX zone at the specified flowrate (longer if air continues to be evacuated at the end of the two-hour period).

(h) Flow Reversal

(i) During flushing/purging, reverse the flow direction through the section at least two times and the total duration that the flow travels in each direction should be approximately equal at the completion of purging. Ensure that the flow reversal apparatus does not introduce air into the system during the reversal procedure.

(i) Record Keeping for Flushing/Purging

(i) During flushing/purging keep records indicating:

1. Time and date that flushing/purging started.

2. Time that flow reversals occurred.

3. Periodic flowrate and pressure measurements.

4. Time and date that flushing completed.

5. Occurrence of any unusual events during flushing/purging

(ii) Maintain records of testing procedures and observations.

8.1.10.2 Performance Requirements

(a) Conduct flushing and purging for a minimum duration indicated in the Basic Requirements. Continue the flushing longer if silt, sand, or other debris is apparent in the flushing discharge from the GHX and if air continues to be removed from the GHX.

(b) Continue the flushing and purging until the water in the GHX is observed to be clear with no evidence of entrained air.

8.1.11 Flow Testing and Pressure Testing

8.1.11.1 Basic Requirements

(a) Flow Testing

(i) Before burial of the piping, conduct flow tests for each GHX zone to verify that all parallel branches are passing flow.

(ii) Conduct the flow test by passing water through each GHX zone at three different flow rates and monitor the total head loss at each flowrate. The three flowrates for the test include: approximately 30% greater than the design flowrate; approximately equal to the design flowrate; and approximately 30% less than the design flowrate.

(iii) For the period of the test, provide temporary pressure gauges on the supply and return pipe ends, an accurate (+/- 5%) flow measuring device, and fittings to appropriately connect the gauges and flow meter to the headers.

(iv) While circulating the flow through GHX zone, measure the flow at

each borehole branch to confirm all borehole flow branches conduct equal flow. Use a non-invasive flowmeter such as an ultrasonic flowmeter to measure flows at the individual boreholes.

(v) Flow Test Records

1. During flow testing keep records indicating:

a. Time and date that flow testing started.

b. Flowrate and pressure measurements.

c. Time and date that flow testing completed.

d. Record of flow observations at each borehole during the testing.

e. Occurrence of any unusual events during testing.

(b) Pressure Testing

(i) After completion of the flow testing, and before burying the GHX piping conduct hydrostatic pressure testing of each GHX zone.

(ii) Meet requirements for pressure testing described in relevant sections of ANSI/CSA C448 SERIES-16 - Design and Installation of Ground Source Heat Pump Systems for Commercial and Residential Buildings.

(iii) Pressure Test Records

1. Record starting and ending pressure readings and the time at which they were taken.

2. Record outdoor temperature and whether the test was conducted under direct sunlight or cloud cover for starting and ending pressure readings.

8.1.12 Backfill and Compaction

8.1.12.1 Basic Requirements

(a) Prior to backfill collect detailed position survey of the location of all boreholes and buried piping. Use registered BC Land Surveyor.

(b) Fine-grained native soils without stones are suitable for bedding of the HDPE piping. Whether native bedding or imported bedding sand is used, ensure the pipe is bedded with 150 mm thickness (below/above/beside) of stone-free bedding. If bedding sand is brought in, allow for removing any offset soil material off site and disposing appropriately.

(i) Compact soils to meet geotechnical engineering requirements for the subject area.

(c) Tracer Wire and Burial Tape

(i) Use wire specifically intended for tracer wire purposes.

(ii) Make all spliced connections in the tracer wire system secure and waterproof using an approved buried service wire closure.

(iii) Place the tracer wire directly above and within a distance of 100 mm from the GHX piping including run-out piping.

(iv) Place yellow buried service warning tape above all GHX piping including run-out pipes. Place the tape at half of the burial depth of the GHX piping.

8.1.13 Antifreeze Installation

8.1.13.1 Basic Requirements

(a) Antifreeze Charging

(i) Only add antifreeze after all headers and interior vault piping has been flushed, purged, flow tested and pressure tested to the satisfaction of the GHX Engineer.

(ii) Volume

1. Estimate the total volume of GHX fluid in each GHX Zone based on the actual piping lengths installed. Confirm the volume with the GHX Engineer prior to installation.

(b) Careful Charging

(i) Add antifreeze such that a pre-measured volume appropriate for achieving the prescribed percentage is introduced into each GHX Zone as a single slug.

(ii) Carefully introduce the antifreeze so that the fluid displaced from the GHX Zone during charging does not inadvertently contain antifreeze.

(c) Circulation

(i) After antifreeze injection circulate all of the zones thoroughly so that even mixing occurs.

(ii) After through circulation collect samples and verify antifreeze concentration.

(d) Record Keeping for Antifreeze Charging

(i) Maintain detailed records indicating the type and the amount of antifreeze placed in each GHX Zone and details about the specific product used including manufacturer, batch numbers, or other identification features of the product.

(e) Maintaining Integrity of GHX Fluid

(i) After full blended circulation of antifreeze has occurred, affix a permanent placard near the manifold that indicates:

1. Geoexchange installing contractor name.

2. Contact person and contact information.

3. Volume of GHX.

4. Type of antifreeze and concentration at date of installation.

8.1.14 Zone Manifold

8.1.14.1 Basic Requirements

(a) Ensure that the GHX zone manifold is designed to:

(i) allow isolation of all borehole zone groups,
(ii) includes ports for flushing and purging with a portable flush cart,

(iii) includes a bypass configuration to allow the GHX to circulate using a flush cart in isolation from the building loop, and allows the building loop to circulate in isolation from the GHX.

(b) A suitable GHX manifold arrangement is shown in the indicative design in Drawings G-1 and G-2.

(c) Include P/T ports on all branches and include bypass valve as shown in Appendix 1G.

8.1.15 Shop Drawing Submittals

8.1.15.1 Submit the following shop drawings for review:

(a) Submittal 19 00 10 – Geoexchange Design Worksheet Submittal documenting GHX simulation inputs and outputs, including:

(i) Software used in the GHX simulation, including the software developer and version number used.

(ii) Peak heating and cooling loads and long-term (monthly/annual) heating and cooling energy.

(iii) Ground thermal properties used in simulations.

(iv) Borehole size and layout characteristics including the borehole diameter, spacing separation between boreholes, borehole layout grid pattern used in simulations.

(v) Borehole completion characteristics including the diameter size and type of the heat exchange tubing, the type of borehole grout including mix ratio and thermal conductivity, and the borehole grout, and any thermal enhancements accounted for the borehole grout in the simulations.

(vi) Type of antifreeze and concentration used in the simulations.

(vii) Minimum heating season ground loop fluid temperature and maximum cooling season ground loop fluid temperature used in the simulations.

(viii) GHX flowrate accounted for in the simulations.

(ix) Computational period (number of seasons) used in the simulations.

(x) Software simulation output printout.

(b) Submittal 19 20 15 – Geoexchange Material Submittal

(i) Submit material issued by manufacturer for all materials including heat exchange tubing, borehole grout, grout thermal enhancements, piping, fittings, insulation, valves, tracer wire, antifreeze product, and manifold.

(ii) Submit HDPE pipe product warranty information.

(c) Submittal 19 20 30 – Geoexchange Qualifications Submittal

(i) Submit designer training and experience qualifications.

(ii) Submit installer training and experience qualifications, including heat fusion training certification.

8.1.16 Record Documentation

8.1.16.1 As built records for inclusion in the Operations and Maintenance manual include:

(a) Accurate, detailed, and dimensioned as-built drawings

(b) Borehole Completion Records for each borehole (in a tabular format similar to Example Template A; Appendix 1G)

(c) Flushing/Purging Record (in a format similar to Example Template B; Appendix 1G)

(d) Flow Testing Record (in a format similar to Example Template C; Appendix 1G)

(e) Pressure Testing Record (in a format similar to Example Template D; Appendix 1G)

(f) Antifreeze Installation Record (in a format similar to Example Template E; Appendix 1G.

8.2 Division 21 - Fire Suppression

8.2.1 Fire Protection

8.2.1.1 Basic Requirements

(a) Provide a sprinkler system and all required equipment designed to the occupancy classification that it protects.

(b) Sprinklers subject to freezing temperatures will be protected by a dry system. Glycol systems will not be allowed.

(c) Provide a double interlocked, cross zoned pre-action supplied sprinkler system in the Main Telecommunications Rooms.

(d) All fire extinguishers will be located in fully recessed, lockable, vandal resistant cabinets with breakable plexi-glass for emergency access. Cabinets will be located in highly visible spaces and located as required by code.

(e) A fire pump will be required if city water pressure and flow is not sufficient. The fire pump will require emergency power supply and will have a transfer switch with is part of the fire pump controller; package mounted in separate mechanically attached enclosure to form one assembly, listed as a complete unit by Underwriters Laboratories.

8.2.1.2 Performance Criteria

(a) Installation, products, workmanship, and testing shall conform to the currently referenced edition of the following:

(i) BC Building Code.

(ii) National Fire Protection Association NFPA-10 – Standard for Portable Fire Extinguishers

(iii) National Fire Protection Association NFPA-13 – Standard for the Installation of Sprinkler Systems.

(iv) Where discrepancies occur between a code, standard or these specifications, the most stringent shall apply.

(b) All equipment and installation will be in accordance with manufacturers' recommendations.

(c) All workers engaged in the construction or modification of the fire protection system shall be journeymen who have Trades Qualifications as Sprinkler Fitters under Province of British Columbia legislation or are indentured apprentices working under the direct supervision of a journeyman who is on the site.

(d) Locate zone shut-off valves so they are within secure back of house spaces, such as a mechanical room, storage room or janitor's closet. All valves controlling water flow will be monitored.

(e) Fire department connection will be installed at a location approved by the Authority Having Jurisdiction.

(f) Submittals include but are not limited to:

(i) Submit to the Owner prior to start of construction:

1. Trades Qualification certificates or other licenses.

2. Certification by the Association of Applied Science Technologists and Technicians of British Columbia for Registered Fire Protection Technicians.

3. Qualifications of technicians installing, testing, and reporting test results on back flow.

a. Shop drawings for all fire protection equipment and accessories must be submitted and reviewed by the Owner or Owners Representative prior to the Design Builder ordering or shipping any subject equipment. Payments will not be processed for equipment not properly documented and reviewed under the terms of submittal.

i) Shop drawings shall be submitted in S.I. (Metric) Units. Shop drawings not submitted in the correct units will be automatically returned without review.

ii) Group shop drawings by specification section for inclusion in Maintenance Manual. Do not combine items into a single submission without separate cover pages for each piece of equipment.

iii) Submit materials and equipment by manufacturer, trade name and model number. Include copies of applicable brochure or catalogue material. Maintenance and operating manuals must be included but are not suitable submittal material on their own.

iv) Review of the shop drawings by the Owner or Owners Representative does not relieve the Design Builder or his supplier of the responsibility to provide the correct and complete equipment, material or installation.

v) Prior to submission, the Design Builder shall review all shop drawings. By this review the Design Builder represents that he has determined and verified all field measurements, field construction criteria, materials, catalogue numbers and similar data or will do so and that he has checked and coordinated each shop drawing with the requirements of the Work.

vi) The Design Builder's review of each shop drawing shall be indicated by his approval

stamp, date and signature on the front of each page. Drawings will not be considered if not previously checked by the Design Builder.

vii) Clearly mark each sheet of printed submittal material, using arrows, underlining or circling, to show particular sizes, dimensions, wiring diagrams, operating clearances, control diagrams, project identification, types, model numbers, ratings, capacities and options actually being proposed. Cross out non-applicable material. Note on the submittal specified features such as special tank linings, pump seals, materials or painting.

viii) The Design Builder shall identify, in writing, on the shop drawings, all aspects, accessories, options etc. that do not conform to the SOR. Failure to do so will result in work being rejected.

ix) The mechanical contractor and the Design Builder shall each review the shop drawings then stamp and initial the front page of each submission package and sign the original transmittal form. The Design Builder's shop drawing review shall include a detailed review of all installation details to ensure that they do not conflict with other trades, and to ensure that the system can be installed as intended.

x) Submit ONE reproducible copy or PDF version of each shop drawing and all supporting material, sufficiently in advance of requirements to allow time for review. Reproducible means photocopy capable for small sheets up to 280 mm by 430 mm (11 inches by 17 inches). Larger sheets shall be printed full scale.

4. Submittals as outlined throughout the SOR.

a. Submit to the Owner during Construction:

i) Submit a Commissioning program for approval. Arrange an acceptable time for the instruction periods once the Owner has approved the program.

ii) Submit Commissioning forms and checklists showing the entire list of actual systems and equipment, including all operations, and set points that will be checked and reported.

iii) Submittals as outlined throughout the SOR

b. Submit to the Owner prior to substantial completion:

i) Record drawings.

ii) Submit a signed statement from the Owner's designated representatives certifying that the demonstration and instruction have been given to his satisfaction.

iii) Submit in writing that the Work is complete, that major and minor construction deficiencies are complete, defects are corrected, and the building is clean and in condition for occupancy.

iv) Submittals as outlined throughout the SOR

8.2.1.3 Documentation, Manuals and Record Drawings

(a) Operating and Maintenance Manual.

(i) Assembly of equipment start-up and functional tests and reports for new, renovated, or necessary existing systems.

(ii) Assembly of equipment and systems operating and maintenance instructions for new, renovated, or necessary existing systems.

(iii) Assembly of final permits for new, renovated, or necessary existing systems.

(iv) Provide one USB memory device labelled and containing the specified materials in Portable Document Format (PDF).

(v) Assemble or develop copies of all certified shop drawings and material required to complete the documentation.

(vi) NFPA Standard No.25, "Standard for the Inspection, Testing and Maintenance of Water Based Fire Protection Systems".

(vii) Contractors shall certify final reproducible Record Drawings to be correct by notation and signature on the drawings.

(viii) Record drawings shall precisely identify the configuration, size and location of all systems and equipment installed under this Division, including but not limited to:

1. All fire protection piping, sprinkler heads, valves, shut off valves, drains, accessories.

2. Miscellaneous; actual room names and numbers, schematic diagrams, riser diagrams.

8.2.1.4 Pipe

(a) Sprinkler System: Steel Schedule 40 for pipe sizes 25 mm to 50 mm (1” to 2”) diameter.

(b) Sprinkler System: Steel Schedule 10 for pipe sizes 65 mm diameter & larger (2-1/2” diameter & larger).

(c) Welded and flange connections, permitted with prior approval of the Engineer.

(d) Valve Station: Steel Schedule 40.

(e) Steel pipe, to the appropriate schedule, shall meet one of the following standards: ASTM A 795, ANSI / ASTM A 53, ANSI / ASME B36.10M, ASTM A 135.

(f) CPVC piping and fittings are not acceptable.

8.2.1.5 Pipe Fittings

(a) All fittings shall be listed for fire protection use.

(b) Sprinkler Piping 25 mm to 50 mm (1” to 2”) diameter: Threaded or Grooved connections, Malleable Iron = ASME B16.1, Cast Iron = ASTM B16.4, or grooved fittings & couplings by Victaulic or SPF/Anvil.

(c) Sprinkler Piping 65 mm (2-1/2”) and larger: Welded, Flanged or Grooved connections. Steel Flanged = ASME B16.5, Steel Buttweld = ASME B16.9, or grooved fittings & couplings by Victaulic or SPF/Anvil.

8.2.1.6 Sprinkler Heads and Escutcheon Plates

(a) Sprinkler heads installed shall be standard coverage, quick response, upright, sidewall or pendant, sized as conditions and density require, and shall be of the proper type and finish for the building and/or areas designated.

(b) Sprinkler heads in attic or ceiling spaces, crawl spaces and on unfinished exposed piping, except where noted, shall be brass finish upright type.

(c) Heads for finished ceilings shall be recessed pendent type, with chrome plated finish and escutcheon plates.

(d) Sprinkler head escutcheons and cover plates shall be part of a listed assembly by the same sprinkler manufacturer and listed for use on the specific sprinkler head it is mounted on.

(e) All sprinkler heads shall be the manufactured within one year of the installation date.

(f) Sprinkler guards shall be by the same sprinkler manufacturer and listed for use on the specific sprinkler head it is mounted on.

(g) Sprinkler piping will be concealed throughout the project, except where specifically noted.

(h) Sufficient heat will be maintained by the Owner, in areas which are theoretically warm spaces, to prevent piping freezing.

(i) Wall, ceiling, and floor penetration – distribution piping greater 65 mm and over: Cast metal floor and ceiling plates with set screws.

(j) Wall, ceiling, and floor penetration – sprinkler piping less than 65 mm: Chrome finished split rings, complete with fastening screws.

(k) Provide sleeves whenever pipes pass through concrete or concrete block walls. Maintain a 12 mm annular clearance between sleeves and pipe. Pack sleeves with flexible material equal to and to maintain fire rating of wall.

8.2.1.7 Alarm and Supervisory Switches

(a) Control valves shall have factory installed integral supervisory tamper switches.

(b) Provide waterflow alarm switch c/w test & drain valve on bulk feed mains running through building, standpipe systems and sections of underground pipe running under the building.

8.2.1.8 Automatic Valves – Wet Systems

(a) For each wet pipe system or zone, provide a factory pre-trimmed riser manifold:

(i) For each bulk feed main to separate zones, provide a factory assembled riser manifold:

1. Main drain shall be piped to a suitable discharge location that is capable of handling routine full flow, full pressure residual tests.

8.2.1.9 Backflow Preventers

(a) Provide a listed fire protection backflow preventer immediately downstream of the combined water connection.

(b) Confirm water supply has been flushed in accordance with NFPA-24 flushing volumes prior to installation, flushing water shall not pass through the backflow preventer.

(c) Installation shall conform to the AWWA cross connection standard, plumbing code, and the local water authority.

(d) Test the completed assembly in accordance with the latest cross connection testing standards, testing technician must have valid cross connection tester certification.

8.2.1.10 Fire Department Connection

(a) The Fire Department connection shall be chrome flush plate type, accessible and within 45 metres (150') of a fire hydrant. Coordinate final location with the Architect and local Fire Department.

(b) External pumper connection is to be isolated by an approved swing check valve in line. The valve shall be fitted with a removable hand access plate for servicing, ball valve for pressure relief.

(c) Provide 12 mm (½") ball drip check valve down stream of the check valve, pipe to drain or exterior, provide union connection for servicing.

8.2.1.11 Fire Water Connection

(a) Connect fire water to tee connection on incoming combined water service, downstream of the supervised building shut-off valve.

(b) Provide a fire water header pipe to serve as the feed pipe to connect dry sprinkler systems, pre-action sprinkler systems, wet sprinkler systems, wet sprinkler zones, standpipe systems, hose valves for forward test flow, header drainpipe, and the Fire Department connection piping.

8.2.1.12 Hangers

(a) All pipe hanger assemblies and riser restrain shall be installed in accordance with NFPA 13, and as noted below.

(b) Exposed piping, with less than 2,400 mm (8') clearance to floors, shall be provided with two times the number of hangers required by Code. Spacing shall be equal or adjusted for maximum benefit.

(c) Riser supports shall be provided at ground level and at each third level above. Where risers are supported from the ground, the ground support constitutes the first level of riser support.

(d) Hanger rods shall not be bent. When fastening to the structure is not at right angles to the piping, provide a manufactured swivel connection.

(e) Provide surge restraint at pendent sprinklers.

8.2.1.13 Identification and Labelling

(a) Piping shall be labelled identifying pipe description and area served, provide directional arrows for flow. Install at 12 meter intervals and on each side of a wall or floor penetration. Piping with sprinkler heads directly attached or standpipes with hose valves directly attached do not require labelling.

(b) Valves, switches, equipment, and devices shall have stamped or engraved metal tags or engraved plastic lamoid tags. The tags shall identify description, normal position, and area/zone served.

8.2.1.14 Inspections and Tests

(a) Pressure Tests:

(i) Fire Sprinkler / Standpipe System Piping: shall be tested to 1,400 kPa for two hours, or 345 kPa more than maximum static pressure if maximum static pressure is greater than 1035 kPa.

(ii) Should tests indicate defective work or variance with specified requirements, make changes immediately to correct the defects.

(b) Functional Tests:

(i) Sprinkler system tests shall be executed with all trim and accessories in normal operating condition, air compressors and excess pressure pumps in auto mode, accelerators and retarders enabled, etc.

8.2.1.15 Nameplates & Plaques

(a) At each sprinkler station there shall be:

(i) Hydraulic design information signs.

(ii) A set of sprinkler system record drawings showing all low point drains and inspector test stations, kept in a plastic zip lock bag next to sprinkler head cabinet.

(iii) Written emergency instructions on how to drain the system, replace heads and restore system to normal, framed under glass.

(iv) A valve schedule relating each tag number to a valve description, sprinkler zone & location, framed under glass.

(v) General information sheet, framed under glass.

(vi) Graphic representation of building identifying extent and type of each sprinkler system and zones c/w locations of main sprinkler station, control valves, flow switches, low point drains, FDC and fire alarm panel, framed under glass.

(vii) List of the spare sprinkler head stock, framed under glass, with the following information: Quantity, make, model, sin #, temperature, k-factor, and finish of each type of sprinkler head.

(viii) Spare sprinkler head cabinet complete with sprinkler heads, wrench, valve handles for all inspector test stations. The cabinet shall not be positioned where room temperatures

would be detrimental to spare sprinkler heads.

8.2.1.16 Pipe and Pipe Fittings

(a) Steel Pipe Threaded Connections:

(i) Threaded steel connections up to and including 2” [50 mm].

(ii) Make screwed joints with standard NPT configuration. Use approved nontoxic joint compound and teflon tape.

(iii) Use reducing tees, reducing elbows, or reducing couplings for all pipe size reductions, bushings will only be permitted for upright sprinkler heads where future dropped ceilings are anticipated.

(iv) Use branch sized reducing tees or saddle type branch connections for directly connecting branch lines to mains in steel piping.

(v) Grooved Pipe Connections:

1. Grooved steel connections for piping 32 mm (1-1/4”) and greater.

2. Make grooved connections in accordance with grooved coupling manufacturer’s recommendations.

3. Use grooved mechanical coupling and mechanical fasteners only in accessible locations.

4. Use flexible grooved fittings where required to allow for some angular deflection, contraction, and expansion.

5. Welding procedures for pipe-o-lets or groove-o-lets shall be in accordance with NFPA-13.

(b) Route piping in orderly manner and maintain proper grades.

(i) Install to conserve head room and interfere as little as possible with use of space.

(ii) Run piping parallel to walls.

(iii) Group piping wherever practical at common elevations.

(iv) Slope piping as required and arrange to drain at low points.

(v) At high points, provide collecting chambers and listed float operated automatic air vents.

(c) Install piping to allow for expansion and contraction without unduly stressing pipe or equipment connected.

(i) Provide clearance for proper installation of fittings, and for access to valves, drains and unions.

(ii) Wet system piping is not to be run in areas which are unheated and considered theoretically cold.

(iii) Piping shall be run in such a manner as not to pass under light fixtures.

(iv) Make minor piping placement changes on site due to site conditions at no extra cost.

8.2.1.17 Placing Into Service

(a) After testing, systems are to be completely drained and the main isolation valves are to be chained and locked shut.

(b) When the entire fire protection system has been completed to the satisfaction of the Engineer and the Owner, including deficiencies, this Contractor shall demonstrate the complete operation and maintenance required to the Owner's representative, the Engineer, and the local Fire Department.

8.2.1.18 Sleeves

(a) Set sleeves in position in advance of other work. Provide suitable reinforcing around sleeves.

(b) Extend sleeves through potentially wet floors 50 mm (2”) above finished floor level.

(c) Where piping passes through floor, ceiling, or wall, close off space between pipe and sleeve with non-combustible insulation or approved non-combustible insulation, fire rated as required to match the rating of the penetrated surface.

(d) Size large enough to allow for movement due to settlement, expansion and to provide for continuous insulation.

(e) Sleeves penetrating vapour barriers shall be sealed at penetrations.

8.2.1.19 Sprinkler Heads & Escutcheons

(a) Head type, configuration and placement shall comply with the specification and occupancy requirements as well as notation requirements on plans. Ensure heads are approved for range required to provide coverage, sprinkler heads installed shall match hydraulic design of the sprinkler system in every aspect.

(b) All sprinkler heads shall be the manufactured within one year of the installation date.

(c) Sprinkler head escutcheons and cover plates shall be by the same sprinkler manufacturer and listed for use on the specific sprinkler head it is mounted on.

(d) Provide extended escutcheons if necessary to clear obstructions.

(e) Align heads in common locations.

(f) Heads in T -bar ceilings shall be positioned on both centerlines of standard lay-in panels. If it is not possible to install heads on both centerlines, heads are to be installed on one centerline which is common with adjacent panels. All heads in T-bar ceilings are to be aligned in both directions. Heads are not to be re-positioned from the locations shown on drawings to reduce the number of heads.

(g) Temperature rating shall suit the specific area considering the proximity to heat producing elements and maximum ceiling temperatures as outlined in NFPA-13.

(h) All sprinkler heads used in horizontal concealed spaces shall be listed for such use in accordance with NFPA-13.

(i) 12 mm (1/2”) extensions fittings for individual sprinkler heads are not permitted.

(j) Where piping is being used to feed upright sprinklers from below the ceiling, the hole is to be cut to allow the passage of pipe and head, and an escutcheon plate shall be used to finish the opening. Provide insulation and sealant if piping passes from heated to unheated space.

(k) Sprinkler head protective caps and straps shall remain in place during construction and removed prior to the time the system is placed into service.

(l) Provide a stock of spare sprinkler heads c/w manufacturers head wrench for each type of sprinkler, minimum head quantities and types shall be in accordance with NFPA-13 requirements. Spare sprinklers shall be housed in manufactured spare head wall boxes, located at the main valve station.

8.2.1.20 Sprinkler Head Guards

(a) Any sprinkler head that is subject to mechanical injury shall be protected with a listed head guard as required by NFPA-13.

(b) Sprinkler guards shall be by the same sprinkler manufacturer and listed for use on the specific sprinkler head it is mounted on.

(c) Examples of areas in which sprinklers considered at risk from mechanical damage and require guards are as follows:

(i) Areas where sprinkler heads are less than 2,400 mm above floor.

(ii) Gymnasiums.

(iii) Electrical Rooms.

(iv) Elevator Machine Rooms.

(v) Custodial Rooms.

(vi) Special areas as required by Fire Insurance Company.

(vii) All exterior sprinkler heads.

8.2.1.21 Valves

(a) Check Valves:

(i) Install a check valve on each incoming Fire Department connection.

(ii) Install a check valve on each sprinkler zone immediately downstream of the control valve, on each zone on buildings over two stories in height.

(b) Drain Valves:

(i) The system drains shall be minimum sizes as required by NFPA-13, they shall discharge into a suitable hub drain (or run to outside of the building). Ensure drain locations can handle the discharge of the drain valve in the fully open position at full city water pressure, without backup or damage.

(ii) Auxiliary drains shall be run to a point where they are accessible and equipped with valve, nipple, and cap or drum drips, locations and sizes for all trapped piping shall be as per current NFPA requirements.

(iii) Drains shall be positioned so as not to cause undue destruction of landscaping or create water or ice hazards. Discharges shall be located to prevent damage during full flow testing. Selection of locations is the responsibility of this Division.

(iv) Drains shall be provided with NPT, male threads at discharge, and threaded cap.

(v) A copy of location and size of all control valves, drains and low points on these systems shall mounted at valve station.

(vi) Drainpipe and fittings exposed to weather shall be galvanized.

(c) Control Valves:

(i) Install a supervised control valve for each fire water supply connection or feed main, sprinkler system, sprinkler zone, standpipe riser.

(ii) Control valves shall be accessible.

(iii) Sprinkler floor control valves and shall be mounted within 7 feet (2,100mm) from the finished floor, or provided with a permanent access ladder.

(d) Test Pipes and Valves:

(i) A test valve shall be provided for testing each water flow alarm device.

(ii) Wet System Flow Switch: A test & drain valve sized in accordance with NFPA 13, with a factory installed orifice to provide a flow equivalent to one sprinkler of a type installed on the system. Pipe the discharge to a safe location capable of handling full pipe diameter residual flow testing, without damage.

(e) Forward Flow Test Valve:

(i) Forward flow test valve shall be provided downstream of the system backflow preventer. Provide a normally closed control valve and adequately sized discharge piping to the building exterior, that can handle the full discharge of the sprinkler systems highest hydraulic demand.

(f) Relief Valves:

(i) Provide a 12 mm (½") relief valve on each sprinkler system or zone, set relief valve at maximum 275 kPa (40 psi) for dry systems and 1035 kPa (175 psi) for wet systems or zones.

8.3 Division 22 - Plumbing

8.3.1 Provide individual water, fire protection, natural gas, sanitary, and storm services as required and sized to suit the usage needs of the Facility. Sewer, storm and water service penetrations will be designed for flexibility and movement. No service will be buried in concrete.

8.3.1.1 Basic Requirements

(a) All plumbing materials will be in accordance with BC Plumbing Code. Provide materials, equipment and labour to install plumbing as required by Provincial and local codes as specified herein.

(b) Provide utility meters for domestic water and natural gas services to the Facility. The location of the water and gas meters will be coordinated with the appropriate utility provider. Each meter will have the ability to connect to the Facility BMS and will also have remote readers compatible with the municipal water meter program.

(c) Provide dedicated utility water and gas meters to the childcare Building. A requirement to connect to Facility BMS.

(d) The meters will be used to accurately measure water flow and natural gas consumption in peak flow conditions as determined by BC Plumbing Code and CSA b149.1:20.

(e) Provide new equipment, CSA approved.

(f) Submittals include but are not limited to:

(i) Submit to the Owner prior to start of construction:

1. Trades Qualification certificates or other licenses

2. Qualifications of technicians installing, testing and reporting test results on back flow preventer.

3. Shop drawings for all plumbing equipment and accessories must be submitted and reviewed by the Owner or Owners Representative prior to the contractor ordering or shipping any subject equipment. Payments will not be processed for equipment not properly documented and reviewed under the terms of submittal.

   a. Shop drawings shall be submitted in S.I. (Metric) Units. Shop drawings not submitted in the correct units will be automatically returned without review.

   b. Group shop drawings by specification section for inclusion in Maintenance Manual. Do not combine items into a single submission without separate cover pages for each piece of equipment.

   c. Submit materials and equipment by manufacturer, trade name and model number. Include copies of applicable brochure or catalogue material. Maintenance and operating manuals must be included but are not suitable submittal material on their own.

   d. Review of the shop drawings by the Owner or Owners Representative does not relieve the contractor or his supplier of the responsibility to provide the correct and complete equipment, material or installation.

e. Prior to submission, the Contractor shall review all shop drawings. By this review the Contractor represents that he has determined and verified all field measurements, field construction criteria, materials, catalogue numbers and similar data or will do so and that he has checked and coordinated each shop drawing with the requirements of the Work.

f. The Contractor's review of each shop drawing shall be indicated by his approval stamp, date and signature on the front of each page. Drawings will not be considered if not previously checked by the Contractor.

g. Clearly mark each sheet of printed submittal material, using arrows, underlining or circling, to show particular sizes, dimensions, wiring diagrams, operating clearances, control diagrams, project identification, types, model numbers, ratings, capacities and options actually being proposed. Cross out non-applicable material. Note on the submittal specified features such as special tank linings, pump seals, materials or painting.

h. The contractor shall identify in writing, on the shop drawings, all aspects, accessories, options etc. that do not conform to the SOR. Failure to do so will result in work being rejected.

i. The mechanical contractor and the general contractor shall each review the shop drawings then stamp and initial the front page of each submission package and sign the original transmittal form. The contractor’s shop drawing review shall include a detailed review of all installation details to ensure that they do not conflict with other trades, and to ensure that the system can be installed as intended.

j. Submit ONE reproducible copy or PDF version of each shop drawing and all supporting material, sufficiently in advance of requirements to allow time for review. Reproducible means photocopy capable for small sheets up to 280 mm by 430 mm (11 inches by 17 inches). Larger sheets shall be printed full scale.

4. Submittals as outlined throughout the SOR.

(ii) Submit to the Owner during construction:

1. Submit to the Provincial Gas Inspection Department, drawings, applicable sections of specifications and detailed drawings as required to obtain approval for the gas installation.

2. Submit a Commissioning program for approval. Arrange an acceptable time for the instruction periods once the Owner has approved the program.

3. Submit Commissioning forms and checklists showing the entire list of actual systems and equipment, including all operations, and set points that will be checked and reported.

4. Submittals as outlined throughout the SOR.

(iii) Submit to the Owner prior to Substantial Performance:

1. Inspection Certificates from authorities having jurisdiction and as required for equipment items to comply with governing Codes and Regulations.

2. Operation and maintenance manuals.

3. Record drawings.

4. Submit a signed statement from the Owner's designated representatives certifying that the demonstration and instruction have been given to his satisfaction.

5. Submit in writing that the Work is complete, that major and minor construction deficiencies are complete, defects are corrected, and the building is clean and in condition for occupancy.

6. Results of all Tests required by the SOR.

7. Submittals as outlined throughout the SOR.

(g) List of acceptable equipment or suppliers is provided below which are approved in principle, but subject to the requirements of the SOR. Request to have alternative materials, equipment or suppliers added to the list of acceptable materials, equipment or suppliers will be considered. Submit proposals to supply alternative materials, equipment or suppliers of equipment in writing:

(i) Acceptable Manufacturers

1. Constant flow valves: Hayes, Victaulic, Griswold

2. Double check backflow preventor: Watts, Febco, Combraco.

3. Reduced pressure backflow preventor: Watts, Febco, Combraco.

4. Floor and hub drains: Watts, Wade, Zurn

5. Domestic water heaters: A.O. Smith

6. Acid waste pipe systems: Orion, Fuseal

7. Acid interceptors: Mifab

8. Fiberglass or polyethylene below grade sediment interceptors: Striem, Zurn

9. Above grade sediment interceptors: Smith, Zurn, Mifab, Watts, Wade

10. Fiberglass or polyethylene below grade oil interceptors: Striem, Zurn

11. Water closets: Toto, American Standard, Kohler

12. Flush valves: Toto

13. Toilet seats: Bemis

14. ADA wall mounted lavatory basins: American Standard

15. Sensor operation lavatory faucets: Moen Commercial

16. Multi-station lavatory systems: Bradley

17. Steel drop-in counter mount basins: Franke

18. Ledge mounted faucets: Moen Commercial

19. Utility sink: Franke, Elkay

20. Wall mounted faucets: Elkay

21. Stainless steel science classroom and laboratory sink: Franke

22. Science classroom and laboratory faucets: Delta Commercial

23. Semi-circular, multi-station washfountain systems: Bradley

24. Gas turrets: Zurn

25. Emergency shower and face wash equipment: Bradley, Haws

26. Laundry boxes: Precision Plumbing Products

27. Electronic trap primers: Precision Plumbing Products

28. Floor mounted rectangular service/mop sinks: Fiat

29. Custodian wall mount faucets: Moen Commercial

30. Bottle filling stations: Elkay

31. Commode washers: RinseWorks

32. Shower mixing valves: Bradley

33. Shower thermostatic mixing valves: Bradley

34. Non-metallic cross linked polyethylene with oxygen barrier pipe systems: Uponor, Rehau

35. Trench Drains: Wade, Watts, Zurn

(h) Provide the plumbing in such a manner as to not disrupt the operation of the School during maintenance or repairs. Design the systems so that regularly occupied areas do not need to be entered when performing these functions. All isolation, maintenance, balancing, and other service valves will be in the corridor ceiling spaces and will be accessible to service personnel.

(i) List of acceptable material or suppliers is provided below which are approved in principle, but subject to the requirements of the SOR. Request to have alternative materials, or suppliers added to the list of acceptable materials, or suppliers will be considered. Submit proposals to supply alternative materials, equipment or suppliers of equipment in writing:

(i) Boiler Condensate Drains:

1. Material: PVC schedule 40

a. Fittings: PVC - solvent weld

(ii) Sanitary Drainage and Vent (above grade including crawlspace):

1. Material: Type M or DWV Copper

a. Fittings: Wrought copper, cast brass - 50/50 solder

2. Material: Cast Iron

a. Fittings: Mechanical joint

(iii) Sanitary Drainage and Vent (buried under building):

1. Material: ABS Solid Core, PVC (CSA Approved) up to 6”

a. Fittings: ABS Solid Core, PVC - solvent weld

2. Material: SDR 35 PVC (CSA Approved)

a. Fittings: gasketed hub and spigot

(iv) Storm Drainage (above grade including crawlspace):

1. Material: Type M or DWV Copper

a. Fittings: Wrought copper, cast brass

2. Material: Cast Iron

    a. Fittings: Mechanical Joint

(v) Storm Sewer (buried under building):

1. Material: Cast Iron

    a. Fittings: Mechanical joint, hub and spigot

2. Material: ABS Solid Core, PVC (CSA Approved)

    a. Fittings: ABS Solid Core, PVC - solvent weld

3. Material: SDR 35 PVC (CSA Approved)

    a. Fittings: gasketed hub and spigot

(vi) Radon Vent:

1. Material: PVC System 15 or equal for non-plenum application. Flame spread rating shall be 25 or less.

    a. Fittings: PVC solvent weld, System 15 or equal as approved by piping manufacturer

2. Material: PVC System XFR or equal for plenum application. Flame spread rating shall be 25 or less and smoke development rating shall be 50 or less.

    a. Fittings: PVC solvent weld, System XFR or equal as approved by piping manufacturer

(vii)Domestic Water (above grade):

1. Material: Type L Hard Copper

    a. Fittings: Wrought copper - lead free solder

    b. Fittings: Cast brass, bronze – threaded

    c. Fittings: Wrought copper or cast bronze, grooved couplings

2. Material: ASTM A312, Type 304, Schedule 10S Stainless Steel:

    a. Fittings: Type 304 stainless steel, press fit

    b. Fittings: stainless steel with grooved couplings. Couplings shall be ductile iron with blue enamel coating.

(viii) Domestic Water (below grade):

1. Material: Type K or Type L Soft Copper

a. Fittings: Cast bronze - Flared tube

2. Material: PVC SCM 150

a. Fittings: Hub and spigot, thrust block at elbows, rod connection at end of line

3. Material: Cast Iron

a. Fittings: Hub and spigot, thrust block at elbows, rod connection at end of line

4. Material: Non-metallic cross linked polyethylene (PEX) to CSA B137.5

a. Fittings: Proprietary compression joint.

b. Below grade piping must be continuous and not have joints.

(ix) Natural Gas (above grade):

1. Material: Steel Schedule 40

a. Fittings: Malleable steel - threaded under 63 mm if approved

b. Fittings: Forged steel - welded 63 mm and over and where required by service

c. Press type fittings are not permitted.

d. Flexible corrugated piping of aluminum or any other material is not acceptable, except at the final connection to equipment.

(x) Natural Gas (underground):

1. Material: Polyethylene

a. Fittings: Thermal bonded

(xi) Compressed Air

1. Material: Under 345 kPa (50 Psi) Type K Hard Copper

a. Fittings: Wrought copper, cast brass - 95/5 solder

2. Material: Steel Schedule 40

a. Fittings: Malleable steel – threaded

(xii)Acid Waste:

1. Material: Polypropylene

a. Fittings: as required by manufacturer

2. Material: Polyethylene

a. Fittings: as required by manufacturer

3. Material: Vulcathene

a. Fittings: as required by manufacturer

(xiii) Relief valve piping – domestic water heater

1. Material: Type M Hard Copper

a. Fittings: Wrought copper, cast bronze - 95/5 solder

(xiv) Foundation Drains:

1. Material: ABS or PVC schedule 40 (perforated)

a. Fittings: Hub and spigot

(j) Pipe fittings shall conform to the following standards:

(i) ANSI/ASME B1.20.1-1983 (Pipe Threads)

(ii) ASTM-197-47 (Materials)

(iii) ANSI B16.3-1977 (Dimensions)

(iv) USAS B2.1-1968 (Pipe Threads)

(v) JIS B 2301-1988 (Screwed Type Malleable Cast Iron Pipe Fittings)

(vi) JIS H 8641-1982 (Zinc Hot Dip Galvanizing)

(vii) JIS G 5702-1988 (Blackheart Malleable Iron Castings)

(k) Insulation Thickness – Above Ground Piping

	Pipe System	Pipe size mm	Thickness mm
(i)			
(ii)	Domestic Cold Water	All Sizes	25
(iii)	Domestic Hot Water	All Sizes	25
(iv)	Re-circulated hot water	All Sizes	25
(v)	Roof drains & rainwater leaders	All Sizes	25
(vi)	Plumbing Vents	All Sizes	25
(vii)	Irrigation Supplies Inside	All Sizes	25

(l) Valves for gas service shall be trimmed and approved for specified service.

(m) Valves used for domestic water recirculation shall be stainless steel and NSF listed for hot potable water.

(n) Provide structural work and equipment required to control expansion and contraction of piping, with pipe loops, pipe offsets, and swing joints. Do not anchor a straight run of steel pipe at both ends. Piping must be allowed to expand or contract through thermal changes by use of pipe bends, loops and supplemental devises, such as expansion couplings.

(o) Label all systems clearly, including painting and labelling of all pipes, ceiling identification dots, valve tagging, and emergency valve identification signage. The following pipe labeling and colour table will be followed:

Pipe Labeling - Figure 1-1

Contents	Background Colour Marking [Background / Legend & Arrows]	Legend
Make-Up Water	Yellow / Black	MAKE-UP WTR
Domestic Hot Water Supply	Green / White	DOM. HW SUPPLY, DHW
Dom. HWS Recirculation	Green / White	DOM. HW CIRC, DHWR
Domestic Cold Water Supply	Green / White	DOM. CW SUPPLY, DCW
Storm Water	Green / White	STORM
Sanitary	Green / White	SAN
Compressed Air (Non-Medical)	Green / White	COMP. A.
Natural Gas	Refer to CGA code	
Fire Protection Water	Red / White	~~FIRE PROT. WTR~~ FP
Condensate Drain	Green / White	COND
Irrigation Water	Per CSA B128.1	
Non Potable Water	Per CSA B128.1	

(p) Ceiling Access Identification will be as follows:

(i) Provide 6mm (1/4") self-adhesive coloured dots to the T-bar framing, adjacent to panel to be removed or to access doors in solid ceilings. Identify the location of equipment concealed above as follows:

1. Yellow - Concealed equipment and cleaning access;

2. Black - Control equipment, including control valves, dampers and sensors;

3. Red - Fire and smoke dampers, fire protection equipment and fire system drains; and

4. Green – Heating glycol, chilled glycol, domestic cold water, domestic hot water isolation valves.

(q) Provide and install all fixtures and equipment to manufacturer's recommendations, and instructions.

(r) Provide the water systems to ensure that water is supplied at minimum water pressure of 210 kPa. Provide multiple pressure reducing valves to ensure pressure uniformity at all flow rates.

(s) Provide water meter with lockable gate valve bypass, backflow preventor, pressure reducing valves, sprinkler valve station and supervised valve in water entry room. Provide 150 mm hub drain for sprinkler and domestic water drain down.

(t) Provide irrigation supply with 350 kPa pressure to most remote head. Provide sewer credit meter as required by the City of West Kelowna. Provide pressure gauge in service room.

(u) Provide durable materials to allow for 24 hour a day operation with minimal downtime. Domestic and non-potable water pipe and fittings in the Building will be Type-L copper, or ASTM A312 Type 304 Schedule 10S stainless steel. PEX-a piping is permitted for use in trap primer lines run below slab. Sanitary and storm piping above ground in the building will be cast iron or copper. Sanitary and Storm pipe and fittings below grade to be ABS Solid Cord or PVC. Radon Vent pipe and fittings to be PVC System 15 or equal for non-plenum applications with flame spread rating of 25 or less.

(i) Maximum pipe velocities for cold water 2.4m/s, hot water 1.5m/s, and hot water recirculation 1.2m/s.

(v) Domestic and non-potable water piping will be connected by soldering, brazing, threading, flange or roll grooved systems. Connections utilizing compression will not be used except for connection of trap primer lines run below slab.

(w) Pressure piping will not be routed underslab. This includes piping such as fire and domestic water lines, ground source and non-potable water systems, and any non-gravity based drainage systems. Services to island sinks in Science Lab to be flexible and routed through PVC conduit to allow removal for service.

(x) Provide services with accessibility to service personnel and serviceability and to avoid interference with other services during operation and maintenance activities. Provide individual domestic water isolation valves for all plumbing fixtures, including water closets, showers, trap seal primers and sinks. All equipment valves and serviceable items will be accessible and removable without adapting wall/ceiling finishes or structure.

(y) Provide floor drains in all mechanical, laundry, kitchen, custodial, and washroom floors, and other areas as required by BC Plumbing Code -and shown on plans, recommended by ASPE, rooms noted in Appendix 1B - Room Data Sheets, and for all devices requiring these drains, including emergency showers, eyewash stations and backflow prevention devices. Ensure all equipment drain piping is terminated at floor drains and floors slope to the drains.

(z) Floor cleanouts in regularly occupied areas are not approved. Ensure ample clearance at cleanout for rodding of drainage systems. Provide cleanouts at the base of each stack.

(aa) Provide domestic water strainers on the incoming services into the Facility. Design will allow for filter maintenance to occur without affecting water flow.

(bb) All piping will be accessible to service personnel. No in-slab domestic water piping is allowed.

(cc) All storm drainage and domestic water piping will be insulated per BC Plumbing Code as required to prevent condensation from developing on the pipe. 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 by BMS and alarmed for both malfunction and service disruption.

(dd) Provide to the owner one full-sized set of reproducible record drawings. Record drawings shall precisely identify the configuration, size and location of all systems and equipment installed under this Contract. Contractors shall certify final reproducible record drawings to be correct by notation and signature.

8.3.1.2 Performance Criteria

(a) The work, including all materials, labour and other services shall conform, but not be limited to the requirements of the latest editions of the following Codes, Bylaws, Standards and Regulations:

(i) British Columbia Building Code.

(ii) Local Building Bylaws.

(iii) WorkSafeBC.

(iv) Canadian Standards Association.

(v) British Columbia Plumbing Code.

(vi) CSA B64.10:17 Selection and installation of backflow preventers/Maintenance and field testing of backflow preventers

(vii) CSA B149.1:20 Natural Gas and Propane Installation Code.

(viii) Technical Safety BC

(ix) EPA – Radon Prevention in the Design and Construction of Schools and Other Large Buildings

(b) Insulate storm drainage, domestic water piping, cooling water and throughout per BCICA quality standards. Where piping and/or piping components are subject to freezing, provide insulation and heat tracing. Provide PVC service jacket on all exposed insulation inside, provide aluminum jacketing outside. Ensure life-safety systems are not installed in locations subject to freezing.

(c) Provide drainage as required to alleviate water pressure exerted onto the bottom of foundations and/or floor slabs.

(d) Provide flushing and disinfection of domestic water systems to AWWA and CSA standards. Provide independent testing by once flushing and cleaning has been completed.

(e) Provide electronically timed trap primers complete with internal air gap, connected to all floor drains, shower drains and hub drains. Each manifold connection shall serve no more than one trap.

(f) Conceal all sanitary, waste, and water piping in walls. Only trap arms and water supply piping will be exposed.

8.3.1.3 Sanitary Drainage System

(a) The sanitary drainage system will be sized for collecting drainage from all plumbing fixtures and equipment. Drainage lines shall be 2% grade unless otherwise approved by the Owner. Underground drainage lines shall be sized at 75 mm minimum unless otherwise noted.

(b) Provide a BC Plumbing Code approved acid-resistant drain waste and vent system for acid disposal applications in all Science Department areas as identified in the Appendix 1B – Room Data Sheets.

(i) Provide a complete acid waste system including piping, connections to lab sinks, traps and acid interceptor.

(ii) Provide where convenient for service personnel access, with pH sensing and pH output signal and low pH alarm to BMS. Provide companion sediment trap upstream of acid neutralizer.

(iii) Use acid resistant drain and vent piping and fittings.

(iv) All traps to be 50 mm trap seal.

(c) Sinks in art classrooms and preparation spaces will be provided with sediment/clay interceptor. Ensure clearance above interceptor for removal of strainer by service personnel.

(d) Provide heavy duty DIN Class C loading area drains or trench drains in Automotive/Mechanics areas as identified in the RDS. Ensure clearance above catch basin for removal of strainer.

(e) Provide oil and particle separation systems in the Automotive/Mechanics and Metals Shop as identified in the Appendix 1B – Room Data Sheets and serving elevator pit drain where hydraulic elevator is used. Provide adequate storage to prevent failure of separation systems in event that the largest oil containing vessel completely empties into drainage systems served. Locate interceptors to be accessible by service personnel for maintenance access, upstream of any sanitary drain connections to the building sanitary drain system.

8.3.1.4 Compressed Air Systems:

(a) For system pressures under 345 kPa use Type K Hard Copper pipe and wrought copper, cast brass fittings - 95/5 solder or Steel Schedule 40 pipe, threaded pipe connections up to 50 mm with malleable steel fittings, welded forged steel fittings above 50 mm. No piping is to be smaller than 25 mm.

(b) A compressed air system will be required for general use for hand tools and cleaning at worktables and along walls in Shop areas. Compressed air piping and outlets serve all areas in Automotive/Mechanics, Woodworking Shop and Metals Shop as identified in the Appendix 1B – Room Data Sheets. Final outlet locations to be determined by Owner with to a maximum of 1 outlet per 30 m2.

(c) Air compressor will be complete with receiver, starter switch, and belt guard, oil & water separator. Provide condensate drain, intake, 2 stage filter and muffler. Operating pressure to be 1,200 kPa at 22 l/s.

(d) Each outlet will be complete with shut off valve, dirt leg, quick connect outlet and pressure regulator.

(e) Ensure reciprocating air compressors operate at specified air volume without oil creep, are non-over loading and operate within 10% of peak efficiency. Air receivers and other accessories shall comply with all applicable codes and regulations for pressure vessels and systems.

8.3.1.5 Gas Piping Systems:

(a) Steel Schedule 40 pipe. Threaded pipe connections up to 50 mm with malleable steel fittings. Welded forged steel fittings above 50 mm. No piping is to be smaller than 25 mm.

(b) The gas piping system will be capable of providing gas supply to all gas fired equipment, without application of diversity factors, at the pressure required by the equipment.

(c) Gas piping design and installation will comply with CSA-B149.1 and the Technical Safety BC regulations.

(d) Prime coat and paint all pipes exposed or above ground piping.
(e) The main incoming gas service will be provided with a seismic actuated shut-off valve.

(f) Provide emergency natural gas shutoff panic switches in each Science Department area as identified in the Appendix 1B – Room Data Sheets equipped with natural gas outlets. Main shut-off valves will be key-operated located below Lab Bench.

(g) Provide locking turrets for all gas turrets in Science Department areas as identified in the Appendix 1B – Room Data Sheets where equipped.

(h) Where gas piping is concealed, locate openings to allow potential gas leaks to communicate to occupied areas.

(i) For gas piping located below slab, provide continuous piping with no fittings below grade. Do not bend pipe beyond manufacturer's tolerances at changes in direction.

8.3.2 Redundancy – Plumbing Equipment

8.3.2.1 Provide for controlled overflow or redundant drainage at all points where blockage of a single drain (e.g. by leaves, snow or ice) could cause ponding.

8.3.3 Floor Drainage, water containment:

8.3.3.1 Provide floor drains at all mechanical, laundry, kitchen, custodian, and washroom floors, and other areas as required by BC Plumbing Code, recommended by ASPE, or required by Appendix 1B - Room Data Sheets.

8.3.3.2 All mechanical rooms floors other than those at grade will be waterproof, and drainage systems will be provided. Curbs will be provided at all penetrations other than floor drains.

8.3.4 Plumbing Fixtures

8.3.4.1 Basic Requirements

(a) All plumbing fixtures will be of institutional quality.

(b) Fixtures of any one type shall be by the same manufacturer. Fittings of any one type shall all be by the same manufacturer.

(c) Provide chrome plated rigid or flexible supplies to fixtures with ¼ turn ball valve type screwdriver stops, reducers and escutcheons.

(d) List of acceptable fixtures, materials and equipment is included in the SOR. Tenders are to be based on use of the specified equipment or equipment included in the acceptable materials clauses. A request for approval to supply alternative fixtures, materials or equipment is required.

(i) Fixtures, materials or equipment alternatives: Identify specific materials or equipment for which alternates are requested. Provide specific technical data indicating dimensions, performance, weight, size, arrangement, etc. and other data as necessary or requested.

(e) Where no list of acceptable materials, equipment or suppliers is included in the SOR sections, Tenders are to be based on use of the specified materials, equipment or suppliers or any other material that complies with the specifications for quality, certification, material, performance, etc.

(f) All wall hung fixtures will be supported by floor mounted carriers.

(g) Water closets will consist of floor mounted elongated bowls with an open front seat and wired or self-powered automatic infrared sensor-activated, electronic flush valves. Handicap accessible toilets will be floor mounted rear outlet bowls with an open front seat and wired or self-powered automatic infrared sensor-activated electronic flush valves. Floor mounted toilets will be a minimum of 432mm (17”) from floor to rim. Flush valves to be concealed behind brushed stainless steel cover plate with manual override and flush mount sensor.

(h) Provide plumbing fixtures identified in the Appendix 1B – Room Data Sheets. Each fixture tag in the Data Sheets has a corresponding tag in the schedules for cross reference. Request to have alternative materials, equipment or suppliers added to the list of acceptable materials, equipment or suppliers will be considered. Submit proposals to supply alternative materials, equipment, or suppliers of equipment by providing an identical schedule, with each value of the alternate equipment compared to the specified equipment value. Photocopied schedules, marked with the alternate characteristics, would be acceptable. Alternates are to be based on use of the specified materials, equipment or suppliers or any other material that complies with the schedules below for quality, certification, material, performance, etc. Each fixture tag in the Appendix 1B – Room Data Sheets has a corresponding tag in the schedules for cross reference.

SD 23	
PLUMBING FIXTURES	
TAG	WC-1
Design Description	ADA FLUSH VALVE WATER CLOSET - CONCEALED FLUSH VALVE
FIXTURE PARAMETERS	WATER CLOSET
	Toto #CT705ULNG
	ADA Right Height Elongated Toilet
	380 mm (15") high
	Vitreous china with CeFiONtect Glaze surface
	Elongated bowl
	White finish
	Floor mounted
	Floor outlet
	4.9 L (1.28 US Gal) per flush
	260 mm x 244 mm (10-1/4" x 9-5/8") water surface
	60 mm (2-3/8") fully glazed internal trapway
	305 mm (12") rough-in
	Bolt caps
	Floor flange same material as the connecting pipe drain
FIXTURE TRIM	SEAT
	Bemis Commercial Heavy-duty Plastic Toilet Seat 1955SSCT-000
	White
	Open front
	Less cover
	Self-sustaining check hinge
	FLUSH VALVE
	Toto EcoPower TET2LA32#SS
	1.28 GPF automatic infrared sensor-activated
	Heavy duty 14”X12” stainless steel coverplate with satin finish
	Solid bronze valve body
	Smart sensor with self adjusting detection range
	Manual flush override

SD 23	
PLUMBING FIXTURES	
TAG	WC-2
Design Description	STANDARD HEIGHT FLUSH TANK WATER CLOSET
FIXTURE PARAMETERS	WATER CLOSET
	American Standard 215CA.104
	Elongated Toilet
	380 mm (15") high
	Vitreous china, Glazed trapway, Everclean Surface
	Elongated bowl
	White finish
	Floor mounted
	Floor outlet
	4.9 L (1.28 US Gal) per flush
	225 mm x 200 mm (9" x 8") water surface
	50 mm (2-1/8") fully glazed internal trapway
	305 mm (12") rough-in
	Bolt caps
	Floor flange same material as the connecting pipe drain
FIXTURE TRIM	SEAT
	Bemis Commercial Heavy-duty Plastic Toilet Seat 1955SSCT 000
	White
	Open front
	Less cover
	Self-sustaining check hinge

SD 23	
PLUMBING FIXTURES	
TAG	WC-3
Design Description	ADA FLUSH TANK WATER CLOSET
FIXTURE PARAMETERS	WATER CLOSET
	American Standard 215AA004
	ADA Right Height Elongated Toilet
	430 mm (17") high
	Vitreous china, Glazed trapway, Everclean Surface
	Elongated bowl
	White finish
	Floor mounted
	Floor outlet
	6.0 L (1.6 US Gal) per flush
	225 mm x 200 mm (9" x 8") water surface
	50 mm (2-1/8") fully glazed internal trapway
	305 mm (12") rough-in
	Bolt caps
	Floor flange same material as the connecting pipe drain
FIXTURE TRIM	SEAT
	Bemis Commercial Heavy-duty Plastic Toilet Seat 1955SSCT 000
	White
	Open front
	Less cover
	Self-sustaining check hinge

(i)

SD 23	
PLUMBING FIXTURES	
TAG	LV-1
Design Description	ADA WALL MOUNTED LAVATORY - TOUCH FREE FAUCET
FIXTURE PARAMETERS	LAVATORY
	American Standard Lucerne 0355.012
	ADA Wall mounted basin
	Vitreous china
	3 holes on 4" Centers
	Recessed self-draining faucet ledge
	Front overflow
	Faucet Ledge
	864 mm (34") Mounting height
	32 mm (1-1/4") trap
	Concealed arms support
FIXTURE TRIM	FAUCET
	Moen Commercial 8551AC
	Deck mount
	Sensor operation lavatory faucet and solenoid located behind metal facia
	1.9 LPM (0.5 GPM)
	4" deck plate
	AC powered, Transformer 104630 to connect up to 8 faucets
	Ceramic cartridge
	THERMOSTATIC MIXING VALVE
	Lawler #TMM-1070
	Bronze body
	Temperature adjusting dial
	10 mm (3/8") inlets and outlet compression fittings
	High temperature thermostatic limit stop
	Shut-off with automatic reset when temperature exceeds 48.8 °C (120 °F)
	Integral checks
	Temperature range from full cold through 46 °C (114.8 °F)
	FAUCET SUPPLIES AND DRAIN
	McGuire #LFH170BV supplies
	Chrome plated finish polished brass
	Commercial duty 1/4 turn ball valve angle stops
	32 mm (1-1/4") cast brass, offset, open grid inline waste strainer
	Polished chrome plated finish
	With overflow holes
	DRAIN AND SUPPLY INSULATION
	Self-extinguishing, cellular foam insulation
	Pre moulded covers to required shape for trap and drain fittings
	Pre moulded covers to required shape for taps and stops
	Stop covers to be 'flip top'
	White

(ii)

SD 23	
PLUMBING FIXTURES	
TAG	LV-2
Design Description	MULTI-STATION LAVATORY - TOUCH FREE
FIXTURE PARAMETERS	LAVATORY SYSTEM
	Bradley SS-2N Express
	Two station
	Infrared water and hand dryer
	Stainless steel cap to conceal trench drain
	Terreon Premium Solid Surface countertop
	Empire Grey
	Coal coloured access panel
	ADA complying wall-hung body and frame
	32 mm (1-1/4") trap
	1.9 LPM (0.5 GPM)
	Individual infrared activation for water and hand dryer for each user
	Individual slow-closing solenoid on tempered water for each user
	Hand dryer to have adjustable speeds
	No soap dispenser
	Bradley Navigator thermostatic mixing valve
	AC powered, 120V/60hz, 20 amp
	864 mm (34”) Mounting height
FIXTURE TRIM	HOSE BIBB
	Watts HY-430 Moderate temperature hose bibb
	Mounted on adjacent wall in accessible location, 750 mm (30") above floor

(iii)

SD 23	
PLUMBING FIXTURES	
TAG	LV-3
Design Description	MULTI-STATION LAVATORY - TOUCH FREE
FIXTURE PARAMETERS	LAVATORY SYSTEM
	Bradley SS-3N Express
	Three station
	Infrared water and hand dryer
	Stainless steel cap to conceal trench drain
	Terreon Premium Solid Surface countertop
	Empire Grey
	Coal coloured access panel
	ADA complying wall-hung body and frame
	32 mm (1-1/4") trap
	1.9 LPM (0.5 GPM)
	Individual infrared activation for water and hand dryer for each user
	Individual slow-closing solenoid on tempered water for each user
	Hand dryer to have adjustable speeds
	No soap dispenser
	Bradley Navigator thermostatic mixing valve
	AC powered, 120V/60hz, 20 amp
	864 mm (34”) Mounting height
FIXTURE TRIM	HOSE BIBB
	Watts HY-430 Moderate temperature hose bibb
	Mounted on adjacent wall in accessible location, 750 mm (30") above floor

(iv)

SD 23	
PLUMBING FIXTURES	
TAG	LV-4
Design Description	ADA WALL MOUNTED LAVATORY - TOUCH FREE FAUCET
FIXTURE PARAMETERS	LAVATORY
	American Standard Wheelchair Users Lavatory 9141.011
	ADA Wall mounted basin
	Vitreous china
	3 holes on 4" Centers
	Recessed self-draining faucet ledge
	Rear overflow
	Faucet Ledge
	864 mm (34") Mounting height
	32 mm (1-1/4") trap
	Concealed arms support
FIXTURE TRIM	FAUCET
	Moen Commercial 8551AC
	Deck mount
	Sensor operation lavatory faucet and solenoid located behind metal facia
	1.9 LPM (0.5 GPM)
	4" deck plate
	AC powered, Transformer 104630 to connect up to 8 faucets
	Ceramic cartridge
	THERMOSTATIC MIXING VALVE
	Lawler #TMM-1070
	Bronze body
	Temperature adjusting dial
	10 mm (3/8") inlets and outlet compression fittings
	High temperature thermostatic limit stop
	Shut-off with automatic reset when temperature exceeds 48.8 °C (120 °F)
	Integral checks
	Temperature range from full cold through 46 °C (114.8 °F)
	FAUCET SUPPLIES AND DRAIN
	McGuire #LFH170BV supplies
	Chrome plated finish polished brass
	Commercial duty 1/4 turn ball valve angle stops
	32 mm (1-1/4") cast brass, offset, open grid inline waste strainer
	Polished chrome plated finish
	With overflow holes
	DRAIN AND SUPPLY INSULATION
	Self-extinguishing, cellular foam insulation
	Pre moulded covers to required shape for trap and drain fittings
	Pre moulded covers to required shape for taps and stops
	Stop covers to be 'flip top'
	White

(v)

SD 23	
PLUMBING FIXTURES	
TAG	LV-5
Design Description	DROP-IN COUNTER MOUNT LAVATORY - TOUCH FREE FAUCET
FIXTURE PARAMETERS	LAVATORY
	Franke Commercial OV1619 Single Bowl Countertop Mount Sink
	Drop-in millwork mount, self-rimming faucet ledge
	416 mm (16-3/8") x 470 mm (18-1/2") oval vanity
	1 faucet hole
	18 GA. (1.2 mm) type 304 stainless steel
	Recessed self-draining faucet ledge
	Rear overflow
	32 mm (1-1/4") trap
	Undercoated to reduce condensation and resonance
FIXTURE TRIM	FAUCET
	Moen Commercial 8551AC
	Deck mount
	Sensor operation lavatory faucet and solenoid located behind metal facia
	1.9 LPM (0.5 GPM)
	4” deck plate
	AC powered, Transformer 104630 to connect up to 8 faucets
	Ceramic cartridge
	THERMOSTATIC MIXING VALVE
	Lawler #TMM-1070
	Bronze body
	Temperature adjusting dial
	10 mm (3/8") inlets and outlet compression fittings
	High temperature thermostatic limit stop
	Shut-off with automatic reset when temperature exceeds 48.8 °C (120 °F)
	Integral checks
	Temperature range from full cold through 46 °C (114.8 °F)
	FAUCET SUPPLIES AND DRAIN
	McGuire #LFH170BV supplies
	Chrome plated finish polished brass
	Commercial duty 1/4 turn ball valve angle stops
	32 mm (1-1/4") cast brass, offset, open grid inline waste strainer
	Polished chrome plated finish
	With overflow holes
	DRAIN AND SUPPLY INSULATION
	Self-extinguishing, cellular foam insulation
	Pre moulded covers to required shape for trap and drain fittings
	Pre moulded covers to required shape for taps and stops
	Stop covers to be 'flip top'
	White

SD 23	
PLUMBING FIXTURES	
TAG	LV-6
Design Description	LAVATORY - MANUAL FAUCET
FIXTURE PARAMETERS	LAVATORY
	Franke Commercial OV1821 Single Bowl Countertop Mount Sink
	Drop-in millwork mount, self-rimming faucet ledge
	450 mm (18") x 525 mm (21") oval vanity
	3 faucet hole, 2" on center
	18 GA. (1.2 mm) type 304 stainless steel
	Recessed self-draining faucet ledge
	Front overflow
	32 mm (1-1/4") trap
	Undercoated to reduce condensation and resonance
FIXTURE TRIM	FAUCET
	Moen Commercial 8422F05
	Deck mount
	4.5 LPM (1.2 GPM)
	4" deck plate
	Ceramic cartridge
	THERMOSTATIC MIXING VALVE
	Lawler #TMM-1070
	Bronze body
	Temperature adjusting dial
	10 mm (3/8") inlets and outlet compression fittings
	High temperature thermostatic limit stop
	Shut-off with automatic reset when temperature exceeds 48.8 °C (120 °F)
	Integral checks
	Temperature range from full cold through 46 °C (114.8 °F)
	FAUCET SUPPLIES AND DRAIN
	McGuire #LFH1708V supplies
	Chrome plated finish polished brass
	Commercial duty 1/4 turn ball valve angle stops
	32 mm (1-1/4") cast brass, offset, open grid inline waste strainer
	Polished chrome plated finish
	With overflow holes

(vi)

SD 23	
PLUMBING FIXTURES	
TAG	SH-1
Design Description	FIELD BUILT TILE SHOWER - PRESSURE BALANCING SHOWER VALVE SET
FIXTURE PARAMETERS	Field built tile shower by others
FIXTURE TRIM	SHOWER MIXING VALVE Bradley 1C Eco Flo S59-1000 pressure balancing valve ADA lever handle off/on and temperature control Allen key volume control S15 5.7 LPM (1.5 GPM) Institutional showerhead Lockable ball joint

(vii)

SD 23	
PLUMBING FIXTURES	
TAG	SH-2
Design Description	FIELD BUILT TILE SHOWER - TEMPERED SUPPLY WITH METERING VALVE
FIXTURE PARAMETERS	Field built tile shower by others
FIXTURE TRIM	SHOWER MIXING VALVE
	Bradley 1C
	Air pushbutton air metering valve
	ADA chrome-plated pushbutton and coverplate
	Forged brass valve body
	Non-hold open, timer adjustable from 5-45 seconds
	S15 5.7 LPM (1.5 GPM) Institutional showerhead
	Lockable ball joint
	THERMOSTATIC MIXING VALVE
	Bradley Navigator S59-4000BY
	Mounted in ceiling, located behind access panel in gypsum ceiling
	Mounting bracket

(viii)

SD 23	
PLUMBING FIXTURES	
TAG	SH-3
Design Description	FIELD BUILT TILE SHOWER - PRESSURE BALANCING SHOWER VALVE SET
FIXTURE PARAMETERS	Field built tile shower by others
FIXTURE TRIM	SHOWER MIXING VALVE
	Bradley 1C
	Eco Flo S59-1000T1 (EFT1) pressure balancing valve with temperature display
	ADA lever handle off/on and temperature control
	T-handle adjustable spray pattern
	Axis (B) 5.7 LPM (1.5 GPM) showerhead
	Chrome-plated brass arm
	Ball-joint (non-lockable)
	Hand Shower (A36) 1500 mm (60") flexible hose
	ADA grabbar
	Inline vacuum breaker
	Transfer valve

(ix)

SD 23	
PLUMBING FIXTURES	
TAG	SK-1
Design Description	CLASSROOM SINK
FIXTURE PARAMETERS	Drop-in single bowl sink with faucet ledge
	Franke Commercial #ALBS7805P-3 Single Bowl Countertop Mount Sink
	Drop-in millwork mount, self-rimming faucet ledge
	765 mm (30") wide x 559 mm (22") long x 125 mm (5")high deep
	18 GA. (1.2 mm) type 304 stainless steel
	3 holes 203 mm (8") center
	Satin finish rim and bowls
	Undercoated to reduce condensation and resonance
	Factory applied rim seal
	89 mm (3-1/2") vandal resistant grid with 38 mm (1-1/2") tailpiece
FIXTURE TRIM	FAUCET
	Moen Commercial Faucets M-Dura #8701 Single handle
	Chrome plated finish
	Solid brass exposed body
	Ceramic cartridge
	225 mm (9") spout
	5.7 lpm (1.5 gpm)
	THERMOSTATIC MIXING VALVE
	Lawler #TMM-1070
	Bronze body
	Temperature adjusting dial
	10 mm (3/8") inlets and outlet compression fittings
	High temperature thermostatic limit stop
	Shut-off with automatic reset when temperature exceeds 48.8 °C (120 °F)
	Integral checks
	Temperature range from full cold through 46 °C (114.8 °F)
	FAUCET SUPPLIES AND DRAIN
	McGuire #LFH170BV supplies
	Chrome plated finish polished brass
	Commercial duty 1/4 turn ball valve angle stops
	32 mm (1-1/4") cast brass, offset, open grid inline waste strainer
	Polished chrome plated finish
	With overflow holes

(x)

SD 23	
PLUMBING FIXTURES	
TAG	SK-2
Design Description	ART ROOM SINK - HAND SPRAY
FIXTURE PARAMETERS	Freestanding utility sink
	FRANKE # SSL2418-1/2 Single Bowl Sink
	Floor mounted
	724 mm (28-1/2") wide x 565 mm (22-1/4") long x 356 mm (14") deep
	14 GA. (2.0 mm) type 304 stainless steel
	Backsplash faucet mount
	Stainless steel tubular legs
	Strainer and integral drain and plug
	89 mm (3-1/2") vandal resistant grid with 38 mm (1-1/2") tailpiece
	Solids interceptor below sink
FIXTURE TRIM	FAUCET
	Elkay #LK943LC wall mounted two handles manual handspray
	Chrome plated finish
	Solid brass exposed body
	Ceramic cartridge
	1100 mm (44") flexible hose with sprayhead and 50 mm (2”) lever handles
	4.6 LPM (1.2 GPM) @ 60 PSI Spray Valve
	THERMOSTATIC MIXING VALVE
	Lawler #TMM-1070
	Bronze body
	Temperature adjusting dial
	10 mm (3/8") inlets and outlet compression fittings
	High temperature thermostatic limit stop
	Shut-off with automatic reset when temperature exceeds 48.8 °C (120 °F)
	Integral checks
	Temperature range from full cold through 46 °C (114.8 °F)
	SOLIDS INTERCEPTOR BELOW SINK
	Watts SI-740-M Clay Trap
	Epoxy coated steel body
	Internal straining baffles
	Gasketed epoxy coated cover
	Removable stainless steel dual chamber basket
	Ensure 350 mm service clearance for removal of strainer

(xi)

SD 23	
PLUMBING FIXTURES	
TAG	SK-3
Design Description	SCIENCE CLASSROOM SINK
FIXTURE PARAMETERS	Drop-in single bowl sink with faucet ledge
	Franke Commercial #LBS9407-1
	Drop-in millwork mount, self-rimming faucet ledge
	522 mm (20-9/16") wide x 511 mm (20-1/8") long x 127 mm (5") high deep
	20 GA. (1.2 mm) type 302 stainless steel
	3 holes 203 mm (8") center
	Satin finish rim and bowls
	Undercoated to reduce condensation and resonance
	Factory applied rim seal
	89 mm (3-1/2") vandal resistant grid with 38 mm (1-1/2") tailpiece
FIXTURE TRIM	FAUCET
	Delta Commercial Faucets W6740-C
	Chrome plated finish
	Solid brass exposed body
	Ceramic cartridge
	150 mm (6") long, 377 mm (14.85") high, heavy-duty gooseneck faucet
	Serrated nozzle
	ADA compliant 70 mm (2-3/4") lever blade handle
	THERMOSTATIC MIXING VALVE
	Lawler #TMM-1070
	Bronze body
	Temperature adjusting dial
	10 mm (3/8") inlets and outlet compression fittings
	High temperature thermostatic limit stop
	Shut-off with automatic reset when temperature exceeds 48.8 °C (120 °F)
	Integral checks
	Temperature range from full cold through 46 °C (114.8 °F)
	FAUCET SUPPLIES AND DRAIN
	McGuire #LFH170BV supplies
	Chrome plated finish polished brass
	Commercial duty 1/4 turn ball valve angle stops
	32 mm (1-1/4") cast brass, offset, open grid inline waste strainer
	Polished chrome plated finish
	With overflow holes

(xii)

SD 23	
PLUMBING FIXTURES	
TAG	SK-4
Design Description	LABORATORY SINK
FIXTURE PARAMETERS	Drop-in single bowl sink with faucet ledge
	Franke Commercial #LBS9106-1-2
	Drop-in millwork mount, self-rimming faucet ledge
	349 mm (13-3/4") wide x 346 mm (13-5/8") long x 152 mm (6") high
	20 GA. (1.2 mm) type 302 stainless steel
	2 hole on 100 mm (4") centers
	Satin finish rim and bowls
	Undercoated to reduce condensation and resonance
	Factory applied rim seal
	89 mm (3-1/2") vandal resistant grid with 38 mm (1-1/2") tailpiece
FIXTURE TRIM	FAUCET
	Delta Commercial Faucets W6700-9
	Chrome plated finish
	Solid brass exposed body
	Ceramic cartridge
	150 mm (6") long, 300 mm (12") high, heavy-duty gooseneck faucet
	Serrated nozzle
	ADA compliant 70 mm (2-3/4") lever blade handle
	THERMOSTATIC MIXING VALVE
	Lawler #TMM-1070
	Bronze body
	Temperature adjusting dial
	10 mm (3/8") inlets and outlet compression fittings
	High temperature thermostatic limit stop
	Shut-off with automatic reset when temperature exceeds 48.8 °C (120 °F)
	Integral checks
	Temperature range from full cold through 46 °C (114.8 °F)
	FAUCET SUPPLIES AND DRAIN
	McGuire #LFH170BV supplies
	Chrome plated finish polished brass
	Commercial duty 1/4 turn ball valve angle stops
	32 mm (1-1/4") cast brass, offset, open grid inline waste strainer
	Polished chrome plated finish
	With overflow holes

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SD 23	
PLUMBING FIXTURES	
TAG	SK-5
Design Description	HOME EC SINK
FIXTURE PARAMETERS	Drop-in double bowl sink with faucet ledge
	Franke Commercial #LBD6408P-1-3
	Drop-in millwork mount, self-rimming faucet ledge
	794 mm (31-1/4") wide x 521 mm (20-1/2") long x 200 mm (8")high deep
	18 GA. (1.2 mm) type 302 stainless steel
	3 holes 203 mm (8") center
	Satin finish rim and bowls
	Undercoated to reduce condensation and resonance
	Factory applied rim seal
	89 mm (3-1/2") vandal resistant grid with 38 mm (1-1/2") tailpiece
FIXTURE TRIM	FAUCET
	Moen Commercial Faucets M-Dura #8711 Single handle
	Chrome plated finish
	Solid brass exposed body
	Ceramic cartridge
	225 mm (9") spout
	5.7 lpm (1.5 gpm)
	THERMOSTATIC MIXING VALVE
	Lawler #TMM-1070
	Bronze body
	Temperature adjusting dial
	10 mm (3/8") inlets and outlet compression fittings
	High temperature thermostatic limit stop
	Shut-off with automatic reset when temperature exceeds 48.8 °C (120 °F)
	Integral checks
	Temperature range from full cold through 46 °C (114.8 °F)
	FAUCET SUPPLIES AND DRAIN
	McGuire #LFH170BV supplies
	Chrome plated finish polished brass
	Commercial duty 1/4 turn ball valve angle stops
	32 mm (1-1/4") cast brass, offset, open grid inline waste strainer
	Polished chrome plated finish
	With overflow holes

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SD 23	
PLUMBING FIXTURES	
TAG	SK-6
Design Description	PASS-THROUGH FUME HOOD SINK
FIXTURE PARAMETERS	Provided with Fume Hood

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SD 23	
PLUMBING FIXTURES	
TAG	SK-7
Design Description	WASHFOUNTAIN - TOUCH FREE
FIXTURE PARAMETERS	Semi-circular washfountain system
	Bradley WF2604
	Four station 1372 mm (54") semi-circular
	Foot activated slow closing control valve
	Terreon Premium Solid Surface countertop
	Whisper Grey
	Floor mounted
	Off-line vent with supplies from above
	Standard height
	38 mm (1-1/2") trap
	11.4 LPM (3 GPM)
	Bradley Navigator thermostatic mixing valve

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SD 23	
PLUMBING FIXTURES	
TAG	SK-8
Design Description	SCIENCE CLASSROOM SCIENCE PREP DOUBLE SINK
FIXTURE PARAMETERS	Drop-in double bowl sink with faucet ledge
	Franke Commercial #LBD6408P-1-3
	Drop-in millwork mount, self-rimming faucet ledge
	794 mm (31-1/4") wide x 521 mm (20-1/2") long x 200 mm (8")high deep
	18 GA. (1.2 mm) type 302 stainless steel
	3 holes 203 mm (8") center
	Satin finish rim and bowls
	Undercoated to reduce condensation and resonance
	Factory applied rim seal
	89 mm (3-1/2") vandal resistant grid with 38 mm (1-1/2") tailpiece
FIXTURE TRIM	FAUCET
	Delta Commercial Faucets W6740-C
	Chrome plated finish
	Solid brass exposed body
	Ceramic cartridge
	Swiveling 150 mm (6") long, 377 mm (14.85") high, heavy-duty gooseneck faucet
	Serrated nozzle
	ADA compliant 70 mm (2-3/4") lever blade handle
	THERMOSTATIC MIXING VALVE
	Lawler #TMM-1070
	Bronze body
	Temperature adjusting dial
	10 mm (3/8") inlets and outlet compression fittings
	High temperature thermostatic limit stop
	Shut-off with automatic reset when temperature exceeds 48.8 °C (120 °F)
	Integral checks
	Temperature range from full cold through 46 °C (114.8 °F)
	FAUCET SUPPLIES AND DRAIN
	McGuire #LFH170BV supplies
	Chrome plated finish polished brass
	Commercial duty 1/4 turn ball valve angle stops
	32 mm (1-1/4") cast brass, offset, open grid inline waste strainer
	Polished chrome plated finish
	With overflow holes

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SD 23	
PLUMBING FIXTURES	
TAG	SK-9
Design Description	MULTI-PURPOSE ROOM SINK
FIXTURE PARAMETERS	Drop-in double bowl sink with faucet ledge
	Franke Commercial #ALBD6405P-1-3
	Drop-in millwork mount, self-rimming faucet ledge
	794 mm (31-1/4") wide x 521 mm (20-1/2") long x 125 mm (5")high deep
	18 GA. (1.2 mm) type 302 stainless steel
	3 holes 203 mm (8") center
	Satin finish rim and bowls
	Undercoated to reduce condensation and resonance
	Factory applied rim seal
	89 mm (3-1/2") vandal resistant grid with 38 mm (1-1/2") tailpiece
FIXTURE TRIM	FAUCET
	Moen Commercial Faucets M-Dura #8711 Single handle
	Chrome plated finish
	Solid brass exposed body
	Ceramic cartridge
	225 mm (9") spout
	5.7 lpm (1.5 gpm)
	THERMOSTATIC MIXING VALVE
	Lawler #TMM-1070
	Bronze body
	Temperature adjusting dial
	10 mm (3/8") inlets and outlet compression fittings
	High temperature thermostatic limit stop
	Shut-off with automatic reset when temperature exceeds 48.8 °C (120 °F)
	Integral checks
	Temperature range from full cold through 46 °C (114.8 °F)
	FAUCET SUPPLIES AND DRAIN
	McGuire #LFH170BV supplies
	Chrome plated finish polished brass
	Commercial duty 1/4 turn ball valve angle stops
	32 mm (1-1/4") cast brass, offset, open grid inline waste strainer
	Polished chrome plated finish
	With overflow holes

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SD 23	
PLUMBING FIXTURES	
TAG	SK-10
Design Description	MUSIC ROOM SINK - HAND SPRAY
FIXTURE PARAMETERS	Freestanding utility sink
	FRANKE # SSL2418-1/2 Single Bowl Sink
	Floor mounted
	1200 mm (48") wide x 610 mm (24") long x 340 mm (13-3/8") high
	16 GA. (1.5 mm) type 304 stainless steel
	Backsplash faucet mount
	Stainless steel tubular legs
	Strainer and integral drain and plug
	89 mm (3-1/2") vandal resistant grid with 38 mm (1-1/2") tailpiece
FIXTURE TRIM	FAUCET
	Elkay #LK943LC wall mounted two handles manual handspray
	Chrome plated finish
	Solid brass exposed body
	Ceramic cartridge
	1100 mm (44") flexible hose with sprayhead and 50 mm (2”) lever handles
	4.6 LPM (1.2 GPM) @ 60 PSI Spray Valve
	THERMOSTATIC MIXING VALVE
	Lawler #TMM-1070
	Bronze body
	Temperature adjusting dial
	10 mm (3/8") inlets and outlet compression fittings
	High temperature thermostatic limit stop
	Shut-off with automatic reset when temperature exceeds 48.8 °C (120 °F)
	Integral checks
	Temperature range from full cold through 46 °C (114.8 °F)
	CLAY TRAP BELOW SINK
	Watts SI-740-M Clay Trap
	Epoxy coated steel body
	Internal straining baffles
	Gasketed epoxy coated cover
	Removable stainless steel dual chamber basket

SD 23	
PLUMBING FIXTURES	
TAG	SK-11
Design Description	LAUNDRY SINK
FIXTURE PARAMETERS	Freestanding utility sink
	FRANKE # SSL2418-1/2 Single Bowl Sink
	Floor mounted
	724 mm (28-1/2") wide x 565 mm (22-1/4") long x 356 mm (14") deep
	14 GA. (2.0 mm) type 304 stainless steel
	Backsplash faucet mount
	Stainless steel tubular legs
	Strainer and integral drain and plug
	89 mm (3-1/2") vandal resistant grid with 38 mm (1-1/2") tailpiece
FIXTURE TRIM	FAUCET
	Elkay #LK940HA08T4H wall mounted two handle faucet
	Chrome plated finish
	Solid brass exposed body
	Ceramic cartridge
	5.7 LPM (1.5 GPM)
	THERMOSTATIC MIXING VALVE
	Lawler #TMM-1070
	Bronze body
	Temperature adjusting dial
	10 mm (3/8") inlets and outlet compression fittings
	High temperature thermostatic limit stop
	Shut-off with automatic reset when temperature exceeds 48.8 °C (120 °F)
	Integral checks
	Temperature range from full cold through 46 °C (114.8 °F)

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SD 23	
PLUMBING FIXTURES	
TAG	NG-1
Design Description	4 WAY GAS TURRET
FIXTURE PARAMETERS	Laboratory valve
	Zurn AquaSpec Z8001B
	Polished chrome plated brass
	3/8" N.P.T. male inlet ball valve
	Pressure rating up to 125 PSI
	Blade handle
FIXTURE TRIM	4 way turret
	Zurn AquaSpec Z88400
	Four 90 degree outlets
	3/8" N.P.T. female inlet and outlets

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SD 23	
PLUMBING FIXTURES	
TAG	NG-2
Design Description	2 WAY GAS TURRET
FIXTURE PARAMETERS	Laboratory valve
	Zurn AquaSpec Z8001B
	Polished chrome plated brass
	3/8" N.P.T. male inlet ball valve
	Pressure rating up to 125 PSI
	Blade handle
FIXTURE TRIM	4 way turret
	Zurn AquaSpec Z88200
	Two 90 degree outlets
	3/8" N.P.T. female inlet and outlets

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SD 23	
PLUMBING FIXTURES	
TAG	EW-1
Design Description	EMERGENCY SHOWER AND EYE/FACE WASH
FIXTURE PARAMETERS	Combination shower eye/face wash
	Haws #8320CRP
	AXION MSR eye/face wash with fliptop dust cover and filter
	Powder coated cast aluminum flag handle activation
	13 mm (1/2") IPS chrome plated brass stay-open ball valve with Teflon seal
	AXION MSR hydrodynamic designed ABS plastic showerhead
	70 LPM (20 gpm) flow control
	Sch 40 galvanized steel pipe and fittings
	225 mm (9") diameter floor flange with epoxy coating
	89 mm (3-1/2") vandal resistant grid with 38 mm (1-1/2") tailpiece
FIXTURE TRIM	THERMOSTATIC MIXING VALVE
	Lawler 911E
	Emergency shower mixing valve
	Vandal resistant temperature adjusting
	Positive hot water shut-off
	High temperature thermostatic limit stop
	Recessed stainless steel cabinet
	Integral isolation valves
	32 mm (1-1/4") N.P.T. inlet and outlet

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SD 23	
PLUMBING FIXTURES	
TAG	LB-1
Design Description	LAUNDRY BOX
FIXTURE PARAMETERS	P.P.P. #MM-500MLB
	20 GA. (1.0 mm) steel box, white powder coat finish
	51 mm (2") rubber drain pipe coupling
	Water hammer arrestor-fabricated of type L hard drawn copper

(xxiii)

SD 23	
PLUMBING FIXTURES	
TAG	TP-1
Design Description	ELECTRONIC TRAP PRIMER
FIXTURE PARAMETERS	P.P.P. PT-12
	Internal air gap
	120V controller
	Solenoid valve and enclosure
	5/8" compression fitting
	Dry wall flush mount cabinet
	Prime coat access panel
	Cylinder lock
	350 mm (14") wide x 400 mm (16") tall x 86 mm (3-3/8") deep

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SD 23	
PLUMBING FIXTURES	
TAG	CS-1
Design Description	CUSTODIAN SINK WITH WALL MOUNT FAUCET
FIXTURE PARAMETERS	Floor Mounted rectangular Service / Mop Sink
	Fiat MSB 3624
	Floor mounted
	915 mm (36") wide x 610 mm (24") long x 254 mm (10") high
	Heavy duty molded-stone
	Stainless steel drain with stainless steel strainer
	75 mm (3") outlet
FIXTURE TRIM	FAUCET
	Moen Commercial Faucets #8230
	Chrome plated finish
	Solid brass exposed body
	Ceramic cartridge
	225mm (9") spout with integral vacuum breaker
	Bucket hook
	Built-in stops and support bracket
	Provide additional 19mm (¾") cold water and valve next to faucet for connection to Cleaning Agent by others
	THERMOSTATIC MIXING VALVE
	Lawler #TMM-1070
	Bronze body
	Temperature adjusting dial
	10 mm (3/8") inlets and outlet compression fittings
	High temperature thermostatic limit stop
	Shut-off with automatic reset when temperature exceeds 48.8 °C (120 °F)
	Integral checks
	Temperature range from full cold through 46 °C (114.8 °F)
	BUMPERGUARD, HOSE BRACKET, MOP HANGER AND BACKSPLASH
	Extruded vinyl bumperguard
	914 mm (36") long hose with 33 rubber spring loaded clips hose bracket
	Stainless steel mop hanger
	20 GA (0.9 mm) type 304 stainless steel backsplash panel
	Removable stainless steel dual chamber basket

SD 23	
PLUMBING FIXTURES	
TAG	CS-2
Design Description	CUSTODIAN SINK WITH WALL MOUNT FAUCET
FIXTURE PARAMETERS	Floor Mounted rectangular Service / Mop Sink
	Fiat MSB 2424
	Floor mounted
	610 mm (24") wide x 610 mm (24") long x 254 mm (10") high
	Heavy duty molded-stone
	Stainless steel drain with stainless steel strainer
	75 mm (3") outlet
FIXTURE TRIM	FAUCET
	Moen Commercial Faucets #8230
	Chrome plated finish
	Solid brass exposed body
	Ceramic cartridge
	225mm (9") spout with integral vacuum breaker
	Bucket hook
	Built-in stops and support bracket
	Provide additional 19mm (¾") cold water and valve next to faucet for connection to Cleaning Agent by others
	THERMOSTATIC MIXING VALVE
	Lawler #TMM-1070
	Bronze body
	Temperature adjusting dial
	10 mm (3/8") inlets and outlet compression fittings
	High temperature thermostatic limit stop
	Shut-off with automatic reset when temperature exceeds 48.8 °C (120 °F)
	Integral checks
	Temperature range from full cold through 46 °C (114.8 °F)
	BUMPERGUARD, HOSE BRACKET, MOP HANGER AND BACKSPLASH
	Extruded vinyl bumperguard
	914 mm (36") long hose with 33 rubber spring loaded clips hose bracket
	Stainless steel mop hanger
	20 GA (0.9 mm) type 304 stainless steel backsplash panel
	Removable stainless steel dual chamber basket

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SD 23	
PLUMBING FIXTURES	
TAG	DF-1
Design Description	BOTTLE FILLING STATION
FIXTURE PARAMETERS	Elkay EZWSGRNM8K
	Recessed in Wall Bottle Filling Station
	Non-filtered 8 GPH
	Refrigerated to maintain 10°C (50°F)
	R-134a, Single Phase Hermetically sealed compressor
	Enclosed adjustable thermostat
	32 mm (1-1/4") outlet
	120V GFCI outlet provided by others behind access panel
	Mounting frame for 305 mm (12") wall depth

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SD 23	
PLUMBING FIXTURES	
TAG	CM-1
Design Description	COMMODE WASHER
FIXTURE PARAMETERS	RinseWorks Aquaus ADST-360 Diaper Sprayer
	Wall hung
	Thumb pressure control
	ABS clad
	Brass valve core
	Ceramic disk seals
	1350 mm (54") stainless steel hose
	NSF rated
	Mounting frame for 305 mm (12") wall depth
FIXTURE TRIM	BACKFLOW PREVENTOR
	Watts 009 reduced pressure backflow preventor
	Recessed stainless steel cabinet

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SD 23	
PLUMBING FIXTURES	
TAG	SI-1
Design Description	SOLIDS INTERCEPTOR
FIXTURE PARAMETERS	Striem AA-M
	Below Grade with traffic rated, bolted gasketed composite cover (910 kg)
	Removable basket
	Polyethylene
	Riser adapter to suit

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SD 23	
PLUMBING FIXTURES	
TAG	FD-1
Design Description	FLOOR DRAIN
FIXTURE PARAMETERS	Watts FD-100-A
	Epoxy coated cast iron floor drain with anchor flange
	Reversing clamping collar
	Nickel bronze strainer

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SD 23	
PLUMBING FIXTURES	
TAG	HD-1
Design Description	HUB DRAIN
FIXTURE PARAMETERS	Watts FD-200-DD
	Epoxy coated cast iron floor drain with anchor flange
	Reversing clamping collar
	Nickel bronze hub funnel

SD 23	
PLUMBING FIXTURES	
TAG	HD-2
Design Description	GENERAL PURPOSE INWALL HUB DRAIN
FIXTURE PARAMETERS	Zurn Z1870 Hub Drain
	304 Stainless Steel
	38mm no-hub outlet

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SD 23		
PLUMBING FIXTURES		
TAG		TD-1
Design Description		TRENCH DRAIN
FIXTURE PARAMETERS		Watts Dead Level D Trench Drain System
		UV Stabilized, Talc-filled, Pre-sloped Polypropylene Channels
		150mm wide ductile iron frame, ductile iron grate
		4" no-hub outlet
		DIN EN 1433 Class C Load Compliant
		3600mm in length or as required to match overhead garage door
FIXTURE TRIM		CATCH BASIN
		600mmX600mmX600mm Basin with ductile iron grate
		DIN EN 1433 Class C Load Compliant

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(i) Provide eyewash and emergency shower fixtures in science labs and Shop areas to comply with ANSI Z358.1-2014 and WorkSafe BC guidelines. Tempering valves will have a cold water bypass. Provide reduced pressure backflow preventer on both hot and cold water supply.

(j) Hose bibs will be provided at each Building entrance and around the Building at 25m intervals and be located in easily accessible areas for maintenance purposes. Hose bibs will be non-freeze key operated, with chrome plated hydrant face, integral vacuum breaker, 3/4 in. (19mm) hose connection.

(k) Provide mechanical mixing valves at all fixtures. mechanical mixing valves to be high temperature thermostatic limit stop, shut-off with automatic reset when temperature exceeds 120 ºF (48.8 ºC), integral checks, offer temperature range from full cold through 46 °C (114.8 °F).

(l) Provide with floor mounted custodian sink a valved and capped 19 mm DCW supply for future chemical feed system provided by owner.

(m) Provide lockable gas valve with quick connect for barbeque connection on building exterior of Staff Room. Shut off valve to be in mechanical service areas.

(n) Locate equipment, fixtures, and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.

(o) Provide comprehensive sub-slab soil gas depressurization systems as identified in the EPA Radon Prevention in the Design and Construction of the Schools and Other Large Buildings document.

(p) Provide 38 mm domestic water service to existing Gym. Tie into existing DCW service below grade.

8.3.4.2 Performance Criteria

(a) Provide isolation valves for all plumbing services and clearly identify the location of all valves. Isolate individual washroom fixtures groups separately to allow for maintenance in one room without affecting other areas.

(b) Provide accessible clean-outs for all sinks and lavatories above the flood-level rim of the sink.

(c) Fixtures requiring backflow preventers will have backflow preventers concealed in wall or located in mechanical room or janitor’s custodian’s room.

(d) Size flush valves for the water consumption of the bowl.

(e) If system pressure exceeds the acceptable delivery pressure, then provide pressure reducing valves. Place the valves in accessible locations in mechanical rooms or chases.

(f) All electronic sensor-activated fixtures will be either self-powered or hardwired. Batteries cannot be used as the primary energy source.

8.3.5 Domestic Hot Water

8.3.5.1 Basic Requirements

(a) Provide domestic hot water systems with sufficient capacity and recovery rate for the hot water requirements of the Building. Calculate domestic hot water demand in accordance with BC Plumbing Code and ASPE Plumbing Engineering Design Handbook.

(b) Ensure delivery within 5 seconds of hot water to all fixtures, the recirculation water line will connect at the hot water connection to the faucet to ensure hot water is delivered within 5 seconds. Groups of faucets can be served by a single recirculation water line connection at the end faucet where there is a common hot water supply with no branch pipe longer than 300 mm.

(c) Design the domestic hot water system to prevent growth and spread of Legionella bacteria within the piping, fixtures, or any other component. Design methods will include eliminating dead-leg piping and minimizing uncirculated piping by connecting the circulation system as close as possible to fixtures.

8.3.5.2 Performance Criteria

(a) Provide the hot water generating equipment with a minimum of 2 units sized at 50% total capacity each.

(b) Generate and maintain domestic hot water at 60°C to minimize conditions for Legionella bacteria.

(c) Recirculate domestic hot water from the distribution system(s) back to the generating equipment.

(d) Monitor hot water supply temperatures via the BMS and provide alarm outputs when the temperature exceeds the design set point.

(e) Tanks used to store domestic hot water must be capable of maintaining a water temperature in the tank of 60°C.

(f) Provide dedicated electric hot water generating equipment to fixtures in the Science Department areas as identified in the Appendix 1B – Room Data Sheets. No other fixtures can receive hot water generated from electric water heaters, other domestic hot water is to be heated with gas fired equipment. Recirculate hot water from the distribution system(s) back to the generating equipment.

(g) Domestic Hot Water Heaters to be placed on 100 mm concrete housekeeping pads.

(h) Domestic Hot Water Heaters with input ratings over 30 kW Electrical or 117.2 kW (400,000 btu/h) Gas and/or greater than 24” (610mm) in diameter shall be certified by ASME.

(i) Gas fired Domestic Hot Water Heaters are to have thermal efficiencies of 95% or higher.

8.3.6 NLC Childcare Spaces – Additional Plumbing Requirements

8.3.6.1 All water closets serving the childcare spaces shall be elongated type with a rim height of 260mm.

8.3.6.2 Provide a separate water meter and a separate gas meter as the childcare spaces are to be located in a separate building.

8.4 Division 23 - Heating, Ventilation and Air Conditioning

8.4.1 General HVAC

8.4.1.1 Performance Criteria

(a) The indoor design temperature will be 22°C.

(b) Indoor temperature setpoints will be adjustable ±1°C through the DDC graphic interface by operating and maintenance Staff.

(c) Control tolerance will be ±0.5°C at the zone temperature sensor with no more than 0.5°C swing in any 15-minute period unless there has been an abrupt load change.

(d) The temperature of separate space within a single control zone may vary by up to ±2°C from the zone setpoint.

(e) The temperature gradient between 200mm and 1800mm above the floor at any point more than 300mm from an exterior wall will not exceed ±3°C. Theatre Lighting and Sound area as identified in the Appendix 1B – Room Data Sheets may exceed temperature gradient but is to not exceed 35°C or maximum ambient temperature rating of the lights, power and equipment, whichever is lower.

(f) Air velocity will not exceed 0.15m/s (30ft/min) on the head and shoulders of a person who is seated.

(g) The work, including all materials, labour and other services shall conform, but not be limited to the requirements of the latest editions of the following Codes, Bylaws, Standards and Regulations:

(i) British Columbia Building Code.

(ii) Local Building Bylaws.

(iii) WorkSafeBC.

(iv) Canadian Standards Association.

(v) Technical Safety BC

(vi) Occupation Health and Safety Regulation – BC

(vii) American Conference of Governmental Industrial Hygienists – Industrial Ventilation: A Manual of Recommended Practice for Design, 31st Edition

(viii) BC Ministry of Education and Child Care – Guidance for HVAC Systems

(h) Demonstration Instruction to Owner

(i) Demonstrate to and instruct representatives designated by the Owner on the complete systems operating and maintenance procedures using the assistance of specialist sub trades and manufacturers' representatives.

(ii) Participate in, and aid the Commissioning Agent in, the Commissioning and Demonstration process for each system. Demonstration and training sessions will be convened separately for each piece of equipment and each individual system. No Commissioning, Demonstration, or Training session shall occur at the same time as any other Commissioning, Demonstration, or Training session.

(i) Label all systems clearly, including painting and labelling of all pipes, ceiling identification dots, valve tagging, and emergency valve identification signage. The following pipe labeling and colour table will be followed:

Pipe Labeling - Figure 1-1

Contents	Background Colour Marking [Background / Legend & Arrows]	Legend
Chilled Glycol Supply	Blue / White	CHILLED SUPPLY CWS
Chilled Glycol Return	Blue / White	CHILLED RETURN, CWR
Heating Glycol	Yellow / Black	HEATING SUPPLY, HWS
Heating Glycol	Yellow / Black	HEATING RETURN, HWR
Geo Source Supply	Green / White	GSS
Geo Source Return	Green / White	GSR
Condensate Drain	Green / White	COND

(i) Hydronic Fill Stations: Provide a sign for each hydronic system indicating:

1. System Name,
2. System Fluid and Concentration,
3. Fill Volume,
4. Fill Pressure

(j) Ceiling Access Identification will be as follows:

(i) Provide 6mm (1/4") self-adhesive coloured dots to the T-bar framing, adjacent to panel to be removed or to access doors in solid ceilings. Identify the location of equipment concealed above as follows:

1. Yellow - Concealed equipment and cleaning access.

2. Black - Control equipment, including control valves, dampers and sensors.

3. Red - Fire and smoke dampers, fire protection equipment and fire system drains; and

4. Green – Heating glycol, chilled glycol, domestic cold water, domestic hot water isolation valves.

8.4.1.2 Submittals include but are not limited to:

(a) Submit to the Owner prior to start of construction:

(i) Trades Qualification certificates or other licenses

(ii) Shop drawings for all mechanical equipment and accessories must be submitted and reviewed by the Owner or Owners Representative prior to the contractor ordering or shipping any subject equipment. Payments will not be processed for equipment not properly documented and reviewed under the terms of submittal.

1. Shop drawings shall be submitted in S.I. (Metric) Units. Shop drawings not submitted in the correct units will be automatically returned without review.
2. Group shop drawings by specification section for inclusion in Maintenance Manual. Do not combine items into a single submission without separate cover pages for each piece of equipment.

3. Submit materials and equipment by manufacturer, trade name and model number. Include copies of applicable brochure or catalogue material. Maintenance and operating manuals must be included but are not suitable submittal material on their own.

4. Review of the shop drawings by the Owner or Owners Representative does not relieve the contractor or his supplier of the responsibility to provide the correct and complete equipment, material or installation.

5. Prior to submission, the Contractor shall review all shop drawings. By this review the Contractor represents that he has determined and verified all field measurements, field construction criteria, materials, catalogue numbers and similar data or will do so and that he has checked and coordinated each shop drawing with the requirements of the Work.

6. The Contractor's review of each shop drawing shall be indicated by his approval stamp, date and signature on the front of each page. Drawings will not be considered if not previously checked by the Contractor.

7. Clearly mark each sheet of printed submittal material, using arrows, underlining or circling, to show particular sizes, dimensions, wiring diagrams, operating clearances, control diagrams, project identification, types, model numbers, ratings, capacities and options actually being proposed. Cross out non-applicable material. Note on the submittal specified features such as special tank linings, pump seals, materials or painting.

8. The contractor shall identify in writing, on the shop drawings, all aspects, accessories, options etc. that do not conform to the SOR. Failure to do so will result in work being rejected.

9. The mechanical contractor and the general contractor shall each review the shop drawings then stamp and initial the front page of each submission package and sign the original transmittal form. The contractor's shop drawing review shall include a detailed review of all installation details to ensure that they do not conflict with other trades, and to ensure that the system can be installed as intended.

10. Submit ONE reproducible copy or PDF version of each shop drawing and all supporting material, sufficiently in advance of requirements to allow time for review. Reproducible means photocopy capable for small sheets up to 280 mm by 430 mm (11 inches by 17 inches). Larger sheets shall be printed full scale.

(iii) Submittals as outlined throughout the SOR

(b) Submit to the Owner during construction:

(i) Calculations and technical data with shop drawings, to support drive selection.

(ii) Submit a Commissioning program for approval. Arrange an acceptable time for the instruction periods once the Owner has approved the program.

(iii) Submit Commissioning forms and checklists showing the entire list of actual systems and equipment, including all operations, and set points that will be checked and reported.

(iv) Submittals as outlined throughout the SOR.

(c) Submit to the Owner prior to Substantial Performance:

(i) Inspection Certificates from authorities having jurisdiction and as required for equipment items to comply with governing Codes and Regulations.

(ii) Operation and maintenance manual.

(iii) Record drawings.

(iv) Results of all Tests required by the SOR.

(v) Submit written report containing results of tests and list of chemicals added system during every attendance.

(vi) Perform tests determining strength of glycol solution before system is turned over to the Owner. Provide test prior to end of guarantee and replenish as required.

(vii) Submit a signed statement from the Owner's designated representatives certifying that the demonstration and instruction have been given to his satisfaction.

(viii) Manufacturer's start-up report for the following equipment:

1. Dedicated Heat Recovery Chiller
2. Boilers
3. Sawdust Collector System

(ix) Fire Damper Test Schedule Sheet

(x) Submittals as outlined throughout the SOR

8.4.1.3 Documentation, Manuals and Record Drawings

(a) Operating and Maintenance Manual.

(i) Provide to the Owner USB memory device labelled and containing the specified materials in Portable Document Format (PDF). This generally includes but is not limited to the following:

(ii) Comprehensive description of the operation of the systems, including the function of each item of equipment within the system.

(iii) Assembly of equipment start-up and functional tests and reports for new systems.

(iv) Assembly of equipment and systems operating and maintenance instructions for new systems.

(v) Assembly of final permits for new systems.

(vi) Labelling and identification schedule.

(vii) Air system balance report.

(viii) Water system balance report.

(ix) Chemical cleaning and treatment report for piping systems.

(x) Warranties, certificates and miscellaneous reports.

(xi) Plumbing Fixture Brochure.

(xii) Filter type, specification, model number, efficiency rating, and thickness, correlated with air handling equipment identification.

(xiii) Completed equipment inventory and submittal sheets.

(xiv) Statutory inspection details.

(xv) Control device setting record sheets.

(xvi) Commissioning report provided by commissioning agent.

(xvii) Carbon monoxide detection system calibration and testing report.

(xviii) Letters of assurance from Seismic Engineer.

(xix) Instructions for emergency operation, maintenance, and shutdown of all systems.

(xx) Assemble or develop copies of all certified shop drawings and material required to complete the documentation.

(xxi) Record drawings shall precisely identify the configuration, size and location of all systems and equipment installed under this Division.

(xxii) Manufacturers' data section is to be indexed and ordered to exactly match the sections of the specifications, including section numbering. Each section of the manufacturers' data section is to include an up-to-date copy of the equipment schedule for that section, with the same format as the equipment schedules in the SOR document. The schedule is to be revised to suit all addenda, change orders, and field changes, as well as manufacturers and model numbers matching the equipment supplied. Assemble or develop complete and correct documentation for the operation and preventative maintenance of equipment and systems provided.

8.4.1.4 HVAC System Design Requirements

(a) General

Design Approach: In general, HVAC systems shall be designed and selected for simplicity, ease of maintenance, and effectiveness in meeting the design requirements. Solutions that are unduly complex tend to cost more, fail sooner, and create more ongoing maintenance issues throughout the life of the building. The following attributes shall be considered in minimizing design complexity:

(i) The heat pump plant configuration must match the schematics provided with the drawing package. All capacities indicated in the SOR and Room Data Sheets are for information only and must be validated by the design team.

(ii) Reduce the number of interactions between parts of the system. Systems with closely coupled components encourage unforeseen interactions that create issues and impede trouble shooting. For example, pumping systems shall be carefully decoupled to prevent changes in flow in one part of the hydronic system from affecting flow in other parts of the system.

(iii) Minimize the use of three-way control valves in thermal plant design. Where three-way valves are required, consider using characterized three-way valves and balancing valves to ensure that flow control is consistent regardless of valve position.

(iv) HVAC designs shall favour systems that modulate capacity. Equipment should respond gradually to changes in load not rapidly as this promotes cycling and encourages control instability. For example, heating water and chilled water valves should designed modulate and not operate only full-open and full-closed.

(v) Install hinged doors for tool free access to the filters.

(vi) Avoid opaque control systems. The control sequence and points list shall be designed and written in tandem with the HVAC design to ensure that the systems operate as intended. Avoid reliance on “black-box” control systems provided by equipment manufacturers. The sequence should allow the controls contractor to control equipment operation, modulation, and staging as much as possible to avoid unintended outcomes. Do not leave the sequence entirely up to the controls contractor. All possible operating modes should be understood as part of the mechanical design process.

(vii) Terminal equipment such as unit ventilators or fan coils are not permitted to be installed within the classroom or in the ceiling space.

(viii) Equipment naming convention

1. Terminal equipment and other equipment that serves individual rooms should be tagged with an alphabetic abbreviation followed by a dash and the number of the room served. For example, a fan coil unit that serves room 203 should be tagged as FC-203. If multiple similar units serve a single room, then decimals should be used. For example, if two fan coil units serve room 203, then they should be tagged as FC-203.1 and FC-203.2.

2. Central plant equipment, except for pumps, should be tagged with an alphabetic abbreviation followed by a dash and the number of the room in which the equipment is located. For example, a boiler installed in room 105 would be tagged as B-105. If multiple similar units are installed in a single room, then decimals should be used. For example, if two boilers are installed in room 105, then they should be tagged as B-105.1 and B-105.2.

3. Pumps should be tagged with the abbreviation P followed by a dash, then the room number in which it is installed, then another dash, then a system number, then an identifier number. Typically, heating water loops have a system number of 1 and chilled water loops have a system number of 2. For example, two chilled water pumps installed in room 105 would be tagged as P-105-2.1 and P-105-2.2.

(ix) Certification. All equipment shall have performance data tested and certified by recognized industry authorities such as AHRI.

(x) Availability of localized parts distribution and servicing is critical in maintaining continued operation of facilities. Equipment selections must consider the availability of parts in western Canada (or closer), while servicing must be readily available in the central-Okanagan; availability within Kelowna city limits for parts & service is generally preferred.

(xi) Radiant heated floors shall be used for background heat only, or to remove the chill from a slab floor. Trim heating shall be provided by an air circulating system. Reliance on heated floors for space heating creates temperature inconsistencies because of the substantial delay between a call for heat and the availability of heat once the slab has warmed sufficiently. Heated slabs often continue to release a significant amount of heat long past the time when it is required, resulting in overheating of the space.

(xii)All heat pump systems must include gas boiler backup heat.

(xiii) Do not use ductless split systems in occupied spaces within the main school building.

(xiv) The following systems shall not be included in the design:

1. Variable Refrigerant Flow systems due to controls opacity and the need for specialist service personnel

2. Chilled beams due to temperature inconsistency

3. Chilled floors due to ineffectiveness and chill at foot/ankle level

(xv) Fan rooms must be able to accommodate service personnel within the room with the fan room door closed. Service personnel must not be in direct contact with students while they work.

(b) Ventilation

(i) Utilize high-induction diffusers such as radial twist models in systems with control strategies that include variable airflow. These diffusers prevent dumping of cold air at lower airflows.

(ii) Do not use floor supply grilles in occupied locations that have mechanical cooling. These produce objectionable drafts during periods of high cooling load.

(iii) Do not provide linear diffusers in occupied areas

(iv) Underground ducting shall be avoided due to the risk of Radon entry. If there is no viable alternative to underground ductwork, then pre-insulated HDPE ductwork such as BlueDuct, which is intended specifically for direct burial application, shall be used.

(v) In general, the air distribution system shall be based on air mixing with sufficient air flow to maintain consistent temperatures. Supply air density shown in Room Data Sheets are minimums which must be validated and confirmed by the design team. All capacities indicated in the SOR and Room Data Sheets are for information only and must be validated by the design team.

(vi) Displacement ventilation systems shall be avoided were possible. Where displacement ventilation systems are specifically permitted by the school district, the supply air temperature during full cooling should not be less than 17ºC. In such systems, the air handlers shall utilize face and bypass cooling coils in order to provide effective dehumidification. Displacement is not contemplated for any of the spaces, but the proponent may propose limited use of displacement ventilation as an alternative if an advantage can be proven for the Owner."

(vii) Air distribution within rooms should be arranged with supply diffusers at high level and return grilles near the floor level. This reduces stratification which improves temperature homogeneity, increases air change effectiveness, and reduces energy consumption. This is particularly important in spaces with high ceilings. Destratification fans can be used to supplement supply diffuser and return grille placement but should not be used in lieu of high-level supply and low-level return.

(viii) All supply, return, and exhaust air will be fully ducted to the space being served. Use of the ceiling space for return air transfer is not permitted.

(ix) All outdoor air systems to occupied spaces must be tempered. Untampered outdoor air shall not be introduced directly into an occupied space.

(x) Roll-up doors shall include end switches that are interlocked to either shut down the room's HVAC system when the doors are opened or activate an alarm in situations where a freezing risk is present.

(xi) Operable windows shall include end switches

(xii) Do not rely on passive ventilation for temperature control or ventilation. The extreme summer and winter temperatures experienced in the Okanagan will result in temperature and draft complaints. Passive ventilation strategies can be used to augment a mechanical HVAC system but cannot be used in lieu of a mechanical HVAC components.

(xiii) Duct systems must have balancing dampers at each branch connection. This applies to supply, return and exhaust ducting.

(xiv) Where possible, all duct systems must include at least one elbow between main ducting and diffusers. Balancing dampers that serve individual supply diffusers must be placed as close to the main duct and as far from the diffuser as possible.

(xv) Balancing dampers installed above drywall ceilings must have access doors sized minimum 300mm x 300mm.

(xvi) Avoid designs that include fire rated ceilings with fire rated diffusers.

(xvii) Installation of supply and return ducting on the exterior or roof of the building is not permitted. Where exterior ducting is required, it shall be adequately fastened to the building structure.

(xviii) Fire dampers with dimensions less than 150mm are not permitted as they are unreasonable difficult to reset during trip testing or in the event of a nuisance trip.

(c) Air Filtration

(i) Electrostatic filters and Ultraviolet lighting systems may be used to augment the require mechanical filtration but shall not be considered a substitution.

(ii) Do not use ionization technologies or other systems that clean the air by introducing other products that are either themselves potential contaminants or could result in toxic by-products as part of a chemical breakdown process.

(d) Boilers

(i) Boilers shall be condensing type with sealed combustion systems.

(ii) Provide boilers with a gas input capacity of 117 kW (399 MBH).

(iii) Boilers with aluminum heat exchangers are not permitted due to potential failures when PH strays from tolerances.

(iv) Boiler combustion air shall be drawn directly from outdoors.

(v) Boiler firing rate must be controlled directly by the DDC system. It is not acceptable to operate boilers via a temperature reset signal with internal boiler controls, as these controls do not typically reflect a building's unique response to changes in water temperature or flow. Using the boiler's internal firing rate controls can result in temperature control instability and capacity cycling.

(e) Chemical Treatment

(i) Only propylene glycol shall be used for freeze protection.

(ii) All chemical treatment products shall be by the same supplier, to ensure that the chemicals are fully compatible.

(iii) In geoexchange systems where lower glycol percentages are required, consider utilizing uninhibited propylene glycol along with a compatible top-up corrosion inhibitor.

(iv) Provide side stream filters, chemical pot feeders, and corrosion coupon racks for all hydronic loops.

(v) For closed loops, corrosion inhibitors shall be nitrite-based and must be compatible with all other additives present in the thermal fluid.

(f) Custom and Semi-Custom Air Handling Units

(i) Ensure that casing insulation is adequate to prevent condensation from forming inside of the air handler.

(ii) Access doors shall be designed to prevent them from swinging outwards under positive pressure or inwards under negative pressure.

(iii) Provide ports between major sections to measure pressure drop through the unit. The balancing agent shall not be required to drill holes in the unit to measure a pressure profile.

(iv) Electronically Commutated Motor (ECM) fans, when used, should be controlled based on speed and not calculated airflow. Airflow-based control can be inaccurate and misleading.

(v) Ensure that any variable speed drives serving outdoor equipment are either inside of a conditioned space or are rated for the extreme temperatures that they may be subjected to.

(vi) Air handlers should be arranged for ease of access, with access sections between coils. Provide full access to fans as well as filter and heat recovery sections.

(g) Evaporative Heat Rejection Systems

(i) Fluid coolers shall be constructed with stainless steel pans and shall have variable speed drives on the fans.

(ii) Open cooling towers are not permitted.

(iii) Adiabatic dry coolers shall have removable media

(iv) Avoid open cooling towers that circulate condenser water as these systems create fouling. Where open cooling towers are necessary, they shall be separated from the rest of the condenser water system with parallel redundant shell and tube heat exchangers.

(v) Evaporative heat rejection systems shall be placed away from air intakes, operable windows, doors, and walkways. Refer to ASHRAE 62.

(vi) Adiabatic dry coolers must be adjusted to minimize domestic water runoff.

(vii) Winterizing and freeze protection must be considered for fluid coolers and open cooling towers. Systems that require heat transfer fluid to be drained during the winter are not permitted.

(viii) Fill systems for fluid coolers and cooling towers shall consist of electronic level sensors and control valves on the incoming water lines. These systems shall be controlled and monitored by the Building Automation System.

(h) Fans

(i) Where possible, fans should be direct-drive with either Variable Speed Drives or ECMs. ECM fans shall be controlled based on speed and not calculated airflow. Do not select belt drive fans where a direct drive option is available.

(ii) Locate exhaust fans as close as possible to the exterior of the building while maintaining adequate service access.

(i) Fan Coil Units

(i) Select fan coils for ambient noise requirements.

(ii) Use ECM fans to control airflow. Airflow shall start at a minimum flow and increase linearly with heating, cooling, and ventilation loads. The minimum airflow shall be 50% but be adjustable through the BMS so that Service Personnel can respond to any draft issues that might occur.

(iii) ECM fans shall be controlled based on speed and not calculated airflow. Airflow-based control can be inaccurate and misleading.

(iv) Install fan coils in dedicated service rooms where filter access is unencumbered. Service Personnel shall not have to move building components to change filters.

(v) Provide a 50 mm filter frame with tool free, continuous piano hinged access doors. Filter access shall be from the front. There must be sufficient clearance to remove the filter freely without stripping dust from the face of the filter. Filter frame size to ensure less than 2.5 m/s face velocity.

(vi) Install fan coils in locations where filter access is unencumbered. Service Personnel shall not have to move wiring, seismic restraints, or T-bar grids to change filters.

(vii) Fan coils to be self-contained, factory assembled and prewired, steel cabinet and frame, coil, controls, drain pan, air filter and holding frame. Cabinet and frame to be minimum 18-gauge steel cabinet and frame with baked enamel finish. Fan and coil configuration to be drawn through with supply fan mounted downstream of coil. Coil type to be extended surface with tubes of copper and fins of copper or aluminum, spaced 60 per 100 mm maximum. Helical fins may be crimped. Drain pans to be 20-gauge galvanized steel extending 75 mm from the face of coil, tubing bends or other points where condensation can form.

(j) Heat Exchangers

(i) The use of Heat exchangers shall be minimized due to loss of approach temperature. Where heat exchangers cannot be avoided, they shall be selected with minimal approach temperature difference of no more than 2°C.

(ii) Heat exchangers on closed hydronic loops shall be either plate and frame type for large applications or brazed plate for small applications.

(iii) Shell and tube heat exchangers shall not be used on closed hydronic systems, except where they serve open evaporative cooling systems.

(k) Dedicated Heat Recovery Chillers

(i) Dedicated Heat Recovery Chiller (DHRC) selection must consider the noise environment in which they are installed. The use of sound deadening kits as well as pneumatic vibration isolation shall be considered.

(ii) The DHRC must permit compressor staging control to be directed by the BMS and not via temperature reset. Direct compressor control permits the tuning of staging methodology to improve run time and reduce cycling. This can also provide better methodology in determining which of the two loads (heating or cooling) is dominant.

(iii) Provide buffer tanks for DHRCs that modulate capacity through discrete staging.

(iv) Refer to the Hydronic Buffer Tank section below for guidance on configuration.

(l) Heating and Cooling Zones

(i) Provide a high level of zoning for HVAC systems so that Service Personnel can adjust temperatures to suit facility operation. This is particularly important in multifunctional areas where activities may vary from low to high physical output. HVAC system zoning must also be carefully arranged to prevent spaces with dissimilar load profiles from being served by a common HVAC zone. For example, interior offices or meeting rooms should not be on the same zone as exterior rooms. Each classroom must have a dedicated HVAC zone. Averaging temperature sensors with adjustable weighting can be used where similar load profiles permit several rooms to be grouped together.

(ii) Do not place room temperature sensors on exterior walls, or in locations where there may be excessive and unrepresentative heat generation.

(m) Hydronic Buffer Tanks

(i) Tanks shall be arranged in a two-pipe configuration, with no more than two connections to the hydronic system. Three-pipe tanks do not allow sufficient temperature control, and four-pipe tanks encourage mixing that will short-circuit supply and return piping systems.

(ii) Utilize internal baffles in situations where the hydronic system connections are too close to allow for full use of the tank volume.

(iii) Provide a buffer tank for all heat pumps and chillers.

(iv) Hydronic buffer tanks shall be installed either in a decoupling line in primary/secondary systems or on the return line in primary only systems.

(v) For heat pump or chiller systems, size tanks based on the minimum allowable cycle time for the smallest compressor stage or the lowest unloaded capacity.

(vi) Tanks shall have automatic air vents piped at the top and capped and valved drain connections at the bottom.

(n) Hydronic Systems

(i) All terminal equipment, coils, source equipment, pumps, heat exchangers, etc. shall have isolation valves and circuit balancing valves. Circuit balancing valves shall not be used for isolation service.

(ii) Hydronic systems that include chiller and heat pumps shall be designed for constant flow to each unit. Modular chillers and heat pumps that consist of multiple separate units that are piped together on common supply and return headers shall be designed for variable flow.

(iii) In hydronic systems that require 20% propylene glycol for freeze protection, use glycol throughout the system rather than using heat exchangers to separate glycol loops from non-glycol loops. The loss of approach temperature across a heat exchanger can be detrimental to energy efficiency in heat pump systems.

(iv) Systems that have glycol shall have pressure controlled by a glycol fill tank. The tank shall have a level switch that initiates an alarm in the DDC system if the level drops below tolerance. Systems with glycol shall not also have a domestic water fill system as this can lead to dilution of the glycol and loss of freeze protection.

(v) Hydronic heating systems shall be designed to operate at maximum 46ºC on the design day. Higher temperature loops are not acceptable.

(vi) Hydronic loops that require variable fluid flow to terminal units must be primary/secondary loop systems, with the primary loop being the heating or cooling source loop and the secondary loop being the building load loop. A decoupling line separates the two loops, which will include a buffer tank where noted in this document. Variable flow primary-only systems, where flow in the boilers, chillers or heat pumps varies based on the building load, are not permitted as these systems are more difficult to control effectively and can result in reduced equipment service lives.

(vii) Automatic Air Vents shall be piped to drain for systems without glycol and to the fill tank for systems with glycol.

(viii) Full line-sized centrifugal air separators shall be installed on all hydronic loops, even if those loops also have buffer tanks. The air separators must be installed on the suction side of the main circulator pumps where the system pressure is lowest. This should also be the point where the fill system and expansion tank are connected to maintains static pressure.

(ix) Hydronic heating systems shall be designed for a maximum supply water temperature of 46ºC during the winter design day.

(x) Hydronic heating systems shall be designed for a temperature differential of 11ºC. Higher temperature differentials are not compatible with heat pumps. Under no circumstances shall a system be designed to split the design-day heating load temperature differential between heat pumps and boilers. For example, no system should be designed with a plant leaving water temperature of 56ºC and return temperature of 35ºC, where the water is heated from 35ºC to 46ºC with heat pumps and then from 46ºC to 56ºC with boiler heat. This would severely limit the effectiveness of the heat pump component.

(xi) Hydronic systems that require variable flow to terminal equipment shall be provided with electronic pressure independent control valves, which are pressure independent two-way control valves that have flow feedback to the BMS. The flow feedback shall be used to control the circulator pump speed and shall be displayed to the operator through the BMS interface for future diagnostics.

(xii) All hydronic heating and cooling systems shall operate with temperature reset based on outdoor air as well as demand. The demand-based reset will progressively relax the loop temperature setpoint based on the most demanding zone's setpoint flow rate as compared with design flow rate.

(xiii) Outdoor air heating coils shall have constant flow circulator pumps where the thermal fluid freeze temperature is above the winter design temperature. A check valve shall be used on the decoupling line to ensure that flow can be maintained if the circulator pump freezes.

(o) Pumps

(i) Circulator pumps with motors ratings of 0.74 kW or above shall be vertical in-line split coupled models.

(ii) Circulator pumps with ECMs or integral VFD's shall be controlled based on external pressure or flow measurement. It is not acceptable to use the internal software approximation as this is less reliable.

(iii) Each pump shall have common tubing connected with isolation valves to the supply and return sides of the pump, as well as upstream of the strainer. A single pressure gauge and a single combination instrument tapping (Pete's Plug) shall be provided for each pump.

(p) Terminal Heating Equipment

(i) In locations where terminal heating equipment is exposed to the public, the casing shall be constructed of minimum 18 gage steel.

(ii) Terminal heating equipment that includes fan assisted convection shall not be installed near desks or other workstations.

(q) Electric Resistance Heat

(i) Limit electrical resistance heat to 1% of the total building peak heating load, provided that the total energy use intensity requirements can still be met.

8.4.1.5 General HVAC System Prescriptive Criteria

(a) The following requirements apply to the Building, except where specifically noted otherwise:

(i) System components will be as follows, or equivalent as approved by the Owner. List of acceptable equipment or suppliers is provided below which are approved in principle, but subject to the requirements of the SOR. Request to have alternative materials, equipment or suppliers added to the list of acceptable materials, equipment or suppliers will be considered. Submit proposals to supply alternative materials, equipment or suppliers of equipment in writing:

1. Acceptable Manufacturers

2. Pipe cleaning and chemical treatment: Debois Chemicals

3. Groove and clamp pipe fittings: Victaulic

4. Non-metallic cross-linked polyethylene with oxygen barrier pipe systems: Uponor, Rehau

5. Roof pad supports: Dura-Blok, Mifab, Taylor

6. Fire stopping materials: Self Seal, Hilti, 3M

7. Constant flow valves: Hayes, Victaulic, Griswold

8. Natural gas pressure regulating valves intended for boiler service: Pietro Fiorentini, Fisher.

9. Valves for grooved pipe: Victaulic

.

10. Circuit Balancing Valves: Victaulic.

11. Reciprocating air compressors: Sullair, Ingersoll Rand

12. Buffer tanks: Niles Steel Tank, Wessels, Grundfos

13. Expansion tanks: Amtrol, Wessels, Grundfos

14. Foam cell piping insulation: Armacell

15. Grooved EPDM fitting insulation: Shur-fit

16. Anti-sweat coating: Shur-fit

17. Boilers: IBC

18. Fan coils: Engineered Air, ICE (as represented by ClimaChange Solutions)
19. Air handling units: Engineered Air, VTS
20. Split system cooling fan coil systems: Mitsubishi
21. Split system heat pump with gas backup furnace systems: York
22. Air separators: Wessels, Armstrong, Amtrol
23. Terminal heat transfer units: Kampmann, Jaga
24. Low temperature hydronic unit heaters: Kampmann, Jaga
25. Electronic duct heaters: Neptronic, Thermolec
26. Dedicated heat recovery chillers: Multistack
27. Roof mounted general purpose fans: Loren Cook
28. Industrial vent set fans: Loren Cook
29. Kitchen range hoods: Broan
30. Roof mounted energy recovery ventilators (air to air): Tempeff, BKM
31. Ceiling mounted radial twist type diffusers: E.H. Price, Nailor
32. Control system contractors: Delta Controls
33. Variable speed drives: ABB
34. Ultra-sonic, electronic pressure independent control valves: Belimo
35. Control valves, valve actuators and damper actuators: Belimo
36. Pre-manufactured sawdust collection ductwork: ETP Energy Technology Products, Nederman Canada
37. Sawdust collector systems: N.R. Murphy, Donaldson
38. Balancing dampers: Rossi, Twistknob
39. Fire dampers: Ruskin, Greenheck
40. Combination smoke/fire dampers: Ruskin, Greenheck
41. Science classroom fume hoods: Kewaunee, Labconco
42. Vehicle carbon monoxide exhaust systems: Nederman

43. Carbon monoxide and nitrogen dioxide gas monitor systems: Critical Environment Technologies

44. Air flow meter stations: Ebtron

45. Combination Tappings for Instrumentation: Peterson Equipment Company

46. Testing, Adjusting and Balancing: R. A. Bruce & Associates, Westar Technologies, Inland Technical Services.

(ii) Where no list of acceptable materials, equipment or suppliers is included base design on materials, equipment or suppliers or any other material that complies with the statement of requirements for quality, certification, material, performance, etc. A request for approval to supply alternative materials, equipment or suppliers is not required

(iii) System components will be as follows, or equivalent as approved by the Owner. List of acceptable material or suppliers is provided below which are approved in principle, but subject to the requirements of the drawings and SOR. Request to have alternative materials, or suppliers added to the list of acceptable materials, or suppliers will be considered. Submit proposals to supply alternative materials, equipment or suppliers of equipment in writing:

1. Hot Water Heating to 120oC (250oF), Glycol, Chilled Water:

   a. Material: Steel Schedule 40

      i) Fittings: Malleable steel – threaded

      ii) Fittings: Forged steel - welded, flanged

      iii) Fittings: Grooved Mechanical Couplings

   b. Material: Type M Hard Copper

      i) Fittings: Wrought copper, cast bronze - 95/5 solder

   c. Material: Type M Soft Copper

      i) Fittings: Wrought copper, cast bronze - 95/5 solder

2. In Floor Slab Heat Up to 80oC (180oF), Glycol:

   a. Material: non-metallic cross-linked polyethylene with oxygen barrier, (PEX)

      i) Fittings: Proprietary compression joint.

3. Relief valve piping – boiler

a. Material: Steel Schedule 40

i) Fittings: Malleable steel - threaded

(iv) no failure of any single boiler, pump, VFD, heat pump or central system control valve will be able to prevent heating of the Facility to the required design conditions.

(v) all high points in piping will be equipped with automatic air removal devices including air collection chambers and air vents. Relief will be piped to nearest drain, glycol systems pipe to receiver or back to feed tank. Discharge termination will be visible.

(vi) Unless otherwise indicated, use valves suitable for minimum 862 kPa (125 psig) WSP and 230 degrees C (450 degrees F).

(vii)For equipment removal purposes, isolation valves are to be installed with companion screwed unions on piping less than 75 mm diameter, or flanged connections on piping 75 mm and larger. Grooved mechanical couplings may be used for equipment removal, subject to accessibility, suitability and where approved by specification terms for that piping system or equipment. Install valves as close as possible to isolated equipment to minimize the amount of water lost during maintenance, replacement or drain down operations. Isolation drain valves are to be provided with combination air inlet fitting as required to relieve vacuum during draining operations.

(viii) All equipment to fit through the entry into the rooms they are installed in to allow for replacement without modification or the equipment or building. Dismantling of equipment to meet this requirement is approved only where it does not affect the visual quality, reliability, warranty or appearance once reassembled.

(ix) Isolation valves, unions and bypass piping will be provided to allow for equipment isolation and removal without unduly affecting the system operation or requiring a major drain down.

(x) Pumps shall be selected to operate without vapour binding or cavitation and will be non-overloading. Redundant pumps shall be arranged in a lead-standby configuration such that the design flow can be fully achieved with a single pump; Provide four pipe diameters of straight pipe between the discharge of all pumps and the first fitting.

(xi) Pump construction and installation will permit complete pump servicing without breaking piping or motor connections. All pumps with motors larger than -1.1 kW shall be split-coupled.

(xii) Utilize screw fittings, welded fittings or roll grooved mechanical couplings for all piping.

1. All grooved/mechanical joint products and components shall be Victaulic. Pipe preparation tools will be by the same manufacturer and groove rolls must be specifically designed for the pipe type used.

(xiii) Provide chemical treatment, chemicals and equipment by an agency that specializes in this type of work. Agency shall take full responsibility for providing suitable working systems. Confirm all chemicals used are applied and disposed of in compliance with all guidelines, codes, regulations and requirements of Federal, Provincial, and local governments and local sewage and storm water disposal utilities. Provide sufficient material to adequately treat systems for first year of operation. Submit report of conditions to Owner and Owners Representative.

(xiv) Duct hangers shall follow the recommendations of the SMACNA Duct Manuals.

(xv) Hydronic pipe design, installation and supports shall meet the requirements of ANSI B31.1 2020, Building Service Piping.

(xvi) Ductwork passing through finished vertical surface shall have escutcheons.

(xvii) Ductwork above the roof is not permitted with the exception of self-supporting exhaust ductwork serving the following exhaust systems with roof mounted exhaust fans referred to in the Room Data Sheets:

1. Vehicle Exhaust
2. Finishing Room Exhaust
3. Welding Exhaust
4. Forge Canopy Hood Exhaust
5. Fume Hood Exhaust
6. Chem. Storage Constant Volume Exhaust "

(xviii) Provide structural work and equipment required to control expansion and contraction of piping, with pipe loops, pipe offsets, and swing joints.

(xix) Insulate all chilled & heating water piping, equipment, and accessories in accordance with BC Building Code and BCICA Quality Standards for Mechanical Insulation Manual. Provide PVC service jacketing on all exposed piping inside. Exterior piping will have aluminum jacketing.

1. Materials must be installed by tradespersons with a Red Seal or TQ designation in the Heat and Frost trade, and/or registered apprentices / helpers supervised by qualified journeypersons.

2. The British Columbia Insulation Contractors Association (BCICA) Standards Manual for Mechanical Insulation, latest edition, together with authorized additions and amendments, shall be used as a reference standard and shall form part of the SOR.

3. Furnish the Owner with a Quality BCICA Assurance Certificate for the mechanical insulation work at Substantial Performance of the Work in accordance with the BCICA Quality Assurance Certificate Program (QACP).

4. Insulation on piping that penetrates nonrated walls is to be continuous through the sleeve or penetration. Insulation on piping that penetrates rated walls must be dis-continuous at the rated surface, and not compromise the rating of the penetration. In penetrations or sleeves, pack around pipes with fireproof self-supporting insulation material, properly sealed.

5. Provide PVC recovering on exposed pipe insulation in mechanical rooms. Provide Paintable canvas recovering in all other exposed ceilings. Insulation located in crawlspaces, pipe shafts and suspended ceiling spaces is not considered exposed.

6. Except for chilled water or glycol piping and geoexchange piping, insulation on piping less than 64 mm, may be pierced to allow pipe size hangers. Piping 64 mm and over shall be provided with insulation flashing of heavy gauge metal to prevent crushing and hanger sized for exterior of insulation.

7. Exposed and concealed pipe fittings: Apply pre-formed PVC fitting covers over insulation material. Provide butt end PVC fittings on exposed pipe and fittings except where canvas recovering jacket is required.

8. Chilled Water or Glycol Piping

    a. Use closed cell insulation to insulate flexible braided hoses. Ensure continuous vapour barrier between differing insulation types and fittings.

    b. Cover fittings, valves, unions, flanges, strainers, flexible connections, expansion joints and pumps with equivalent thickness of insulation material. Seal with 100% coverage of vapour barrier sealant and adhesive. Seal butt joints with 100 mm wide strips of vapour proof tape or vapour barrier adhesive.

c. Exposed fittings: Apply pre-formed PVC fitting covers over insulation material, before applying recovering. Provide butt end PVC fittings on exposed fittings.

9. Geoexchange Piping

a. Completely insulate and cover with vapour proof seal, all fittings, valves, unions, flanges, strainers, flexible connections, and expansion joints.

b. Use closed cell insulation to insulate flexible braided hoses. Ensure continuous vapour barrier between differing insulation types and fittings.

c. Completely insulate and install vapour barrier on tank or equipment pipe stubs intended for future connections.

d. Cover fittings, valves, unions, flanges, strainers, flexible connections, expansion joints and pumps with equivalent thickness of insulation material. Seal with 100% coverage of vapour barrier sealant and adhesive. Seal butt joints with 100 mm wide strips of vapour proof tape or vapour barrier adhesive. A vapour barrier mastic is to be applied as per the manufacture's recommendations to all joints of closed cell fitting insulation for a continuous vapour barrier. Apply a coating of a vapour barrier mastic as per manufacture specifications that provides for a 0.03 perm rating from the pipe over the fibrous insulation and a minimum of50mm onto the pipe covering vapor jacket.

e. Exposed fittings: Apply grooved EPDM fitting insulation over fittings. Provide butt end PVC fittings on exposed pipe and fittings. Maintain continuity of vapour barrier at grooved EPDM fitting insulation.

f. Concealed fittings: Apply grooved EPDM fitting insulation over fittings. Maintain continuity of vapour barrier at grooved EPDM fitting insulation.

g. Where insulation is being applied on to below ambient temperature lines, there must be vapor dam installed before and after all fittings/connections and at every 3600mm of straight run pipe.

h. A vapour barrier mastic be applied as per the manufacture's recommendations to all joints for a continuous vapour barrier.

10. Storage Tanks

a. Provide sufficient clearance around openings for normal operation of equipment.

b. Use two layers of insulation with staggered seams.

c. Only use adhesives approved by the insulation manufacturer.

d. Provide PVC protection jacket.

e. Provide a removable insulation piece with “NAMEPLATE DATA” stenciled on the outside surface for access to manufacturer nameplate.

11. Pipe Supports

a. Provide pipe supports similar to Pro-pipe (Shur-fit) for oversized hangers and continuous vapour barrier. Provide Pro-Pipe Supports Seismic (Shur-Fit) for clamp style supports and continuous vapor barrier.

12. Insulation Thickness – Above Ground Piping

	Pipe System	Pipe size mm	Thickness mm
a.			
b.	Piping – Heating	All Sizes	38
c.	Piping – Cooling	All Sizes	38
d.	Refrigerant Suction	All Sizes	13
e.	Geoexchange Piping	Inside Building	All Sizes 38

(xx) The British Columbia Insulation Contractors Association (BCICA) Standards Manual for Mechanical Insulation, latest edition, together with authorized additions and amendments, shall be used as a reference standard and shall form part of this project specification. The Contractor responsible for mechanical installation work shall keep a copy of the above manual available for reference.

1. Insulation Thickness – Ductwork

	Duct and System	Pipe size mm	Thickness mm
a.			
b.	Supply Air Ducts	Warm Space	25
c.	Exhaust or Relief Air Ducts		25
d.	Return Air Ducts	Warm Space	Not Required
e.	Exterior Ducts – Supply & return		50
f.	Exterior Ducts – Exhaust		50
g.	Dryer Vent	Warm Space	Not Required

h. Outdoor air duct downstream of ERV Not Required

(xxi) Duct Gauges – General

1. Rectangular Ducts gauge mm Maximum Width

a. Up to 300 mm 26 0.55

b. 300 mm to 750 mm 24 0.70

c. 760 mm to 1,400 mm 20 0.85

d. 1,400 and over 18 1.01

(xxii) Spiral Round Ducts, Maximum 500 Pa positive

1. Maximum Diameter gauge mm

a. Up to 350 mm 28 0.48

b. 375 mm to 650 mm 26 0.55

c. 675 mm to 900 mm 24 0.70

d. 925 mm to 1,250 mm 20 0.85

e. 1,275 mm to 1,500 mm 18 1.01

(xxiii) Spiral Round Ducts, Maximum 500 Pa negative

1. Maximum Diameter gauge mm

a. Up to 200 mm 28 0.48

b. 225 mm to 350 mm 26 0.55

c. 375 mm to 650 mm 24 0.70

d. 675 mm to 900 mm 22 0.85

e. 925 mm to 1,250 mm 20 1.01

f. 1,275 mm to 1,500 mm 18 1.31

(xxiv) Duct Gauges - Dust Collection System

1. Spiral Round Ducts, Maximum 500 Pa negative

a. Maximum Diameter gauge mm

b. up to 200 mm 26 0.48

c. 225 mm to 350 mm 24 0.55

d. 375 mm to 650 mm 22 0.70

e. 675 mm to 900 mm	20	0.85
f. 925 mm to 1,250 mm	18	1.01
g. 1,275 mm to 1,500 mm	16	1.31
h. 1,525 mm to 2,100 mm	16	1.61

2. Woodshop exhaust ductwork will be high pressure ductwork in accordance with SMACNA – HVAC Duct Construction Standards for Class II, minus 3 kPa., 22 m/sec., Seal Class A. Exhaust ductwork will be smooth internally and continuously welded.

   a. Fabricate in accordance with ASHRAE and SMACNA manuals.

   b. Ductwork shall be clamp-together design using die formed galvanized steel material and welded sections. Each connection shall use rolled edges, gasketed and clamped connections. Fittings and elbows shall be of similar design and clamping sections.

(xxv) (Not Used)

(b) All HVAC equipment requiring regular inspection, servicing, or repair will be:

(i) located indoors or in a fully enclosed and well-lit service space. This does not apply to rooftop air handling units, rooftop exhaust fans, cooling towers, air cooled condensers, or air cooled chillers.

(ii) accessible from floor level wherever feasible.

(iii) access will be provided such that any piece of HVAC equipment can be removed and replaced without adverse effect to normal operation of the Facility, and without removal of walls or structural modifications.

(iv) Terminal equipment will not be placed above drywall or T-bar ceilings.

(v) All floor mounted equipment to be placed on 100 mm concrete housekeeping pads.

(vi) Provide and install all materials and equipment to manufacturer's specifications, standards, and instructions, meet the requirements of CSA, CGA Provincial and Municipal Codes and be CSA listed.

(vii) At a minimum, the DHRC, boilers, pumps, domestic hot water heating systems, and indoor air handling equipment are to have housekeeping pads.

8.4.1.6 Testing, Adjusting, and Balancing (TAB)

(a) The completed reports shall be stamped and signed by an individual who assumes complete knowledge, and responsibility for the procedures, results, and completion of the reports according to specification. This person shall be either a P.Eng, RET, or AScT or CET.

(b) Air Side TAB Report:

(i) HVAC air systems and equipment: Test, adjust and balance, and submit compliant reports.

(ii) Sawdust Collection Systems: Test, adjust and balance, and submit compliant report.

(iii) Fire Dampers: If the installation of fire dampers is in the scope of the project, provide a Fire Damper Drop Test Verification Report.

(iv) Elevator Exhaust Fan Test Reports

1. Include for a separate trip to site to perform these tests outside of regular scheduled TAB testing. If sump testing is required on the project, coordinate to perform that testing during the same extra visit.

2. Report exhaust fan tests.

(v) Air Flow Monitoring Stations Verification

1. If air flow monitoring stations are included as part of the controls scope of work, allow for assistance to controls by measuring the air flow for each air flow monitoring station.

2. Report exhaust fan tests

(c) Hydronic Side TAB Report:

(i) HVAC water systems and equipment: Test, adjust and balance, and submit compliant reports.

(ii) The TAB Agency is responsible for ensuring that motorized equipment is producing results either within allowable volume limits, or that the unit motors are operating at their maximum amperage as listed on their individual motor nameplates. The TAB Agency shall report such measures as may be required to achieve acceptable performance.

(iii) Elevator or other sump pumps: Test and submit compliant reports. This information may be included with the hydronic balance report.

(iv) Domestic water circulating systems and equipment: Test, adjust and balance, and submit compliant reports. This information may be included with the hydronic balance report.

(v) Aid the commissioning agent for the commissioning of the mechanical systems.

(d) Within the context of the contract documents, test, adjust and balance air and hydronic system terminals to provide flow rates within ±10% of those specified, when equipment is operating at seasonal design conditions.

(e) If a shortfall is identified, review motor sizes, motor rotation, balancing damper and valve dispositions, static pressures, dead-head pressures, system effects and any other elements required to ascertain the cause of the shortfall.

(f) Mark settings on valves, dampers and other devices used for adjustment during balancing.

(g) Use custom labels or mark final balance position with a felt marker.

(h) Once the initial balancing is complete, where occupant feedback reports issues, be prepared to recheck random selections of data recorded in report at no extra cost to the project. Recheck points or areas as selected and witnessed by the Engineer or his designate.

(i) Make required adjustments to air terminals, fan speeds, pump speeds and other components and equipment within the confines of these contract documents, and/or as instructed by the Consultant to suit field operating conditions which may differ from the design parameters as listed in the Schedules.

(j) Testing, adjusting and balancing procedures shall be generally in accordance with NEBB or AABC procedures. A major difference is that compliant reports shall contain additional requirements that supersedes NEBB or AABC.

(k) Submit test report(s), and document the as found, and final results for all equipment and systems within the scope of work.

(l) Air Moving Equipment Procedure

(i) Adjust all air handling and distribution systems included in the scope of work, to provide required or design supply, return and exhaust air quantities.

(ii) Make air quantity measurements in ducts by Pitot tube traverse of entire cross-sectional area of duct.

(iii) Measure and adjust air quantities at air inlet and outlets, as appropriate. Provide as found, and final measurements. Include design, as found, and final air velocities as appropriate.

(iv) The TAB Agency is responsible for ensuring that grille deflections on adjustable grilles are manipulated so that objectionable air currents in the space are avoided. Note in Summary, that this has been completed on site.

(v) Use volume control devices to regulate air quantities only to extent that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices, such as dampers.

(vi) Vary total system air quantities by adjustment of fan speeds. Vary branch air quantities by damper regulation.

(vii) The TAB Agency is responsible for ensuring that motorized equipment is producing results either within allowable volume limits, or that the unit motors are operating at their maximum amperage as listed on their individual motor nameplates. The TAB Agency shall report such measures as may be required to achieve acceptable performance.

(viii) Adjust belts and sheaves as required to meet required air flows.

(ix) Align sheaves after balancing to prevent excessive vibration and belt wear. Include in balance report all units in which sheave alignment was checked, and correctly adjusted if necessary.

(m) Building Pressurization Procedure

(i) Determine building pressurization during TAB Pre-setup of the project.

(ii) Provide interim report to determine final building pressurization.

(iii) Adjust total flow rate of required devices to provide the required pressurization of the building during occupied periods. Obtain additional information from the Consultant if necessary.

(iv) Assist sheet metal trade in the installation of weights or devices on relief exhaust gravity dampers as required to adjust building pressure for occupied periods, by providing pressurization measurements.

(n) Miscellaneous Air Side TAB Procedures

(i) Dust Collector Test Reports

1. Record the static pressures at the point of traverse.

2. Record the static pressures at various points along the ductwork system, where pressure taps with removable/replaceable caps, have been located by the Engineer, and installed by the sheet metal contractor.

(o) Air Flow Monitoring Stations Verification

(i) If air flow monitoring stations are included as part of the controls scope of work, allow for assistance to controls by measuring the air flow for each air flow monitoring station by performing pitot tube traverses, and comparing them to the flows reported by the DDC system.

(ii) Coordinate with Controls as they make changes to their DDC results to match pitot tube traverses.

(iii) Provide a minimum of 3 measurement tests corresponding to low flow, medium flow, and high flow through each air flow monitoring station.

(p) Fire Damper Drop Test Report

(i) Witness and report the functioning of each fire damper as it is test dropped by the sheet metal contractor.

(ii) The report shall list all fire dampers and indicate whether they close freely.

(q) Manual and automatic dampers are to be adjusted to provide the specified outdoor air component during occupied mode. The adjustment is to be determined by comparing the mixed air temperature, return air temperature, and outdoor air temperature. During periods when the temperature difference between outdoor and return air is less than 10 degrees Celsius, the Engineer may approve an alternate method of measurement by air flow through air flow measuring hoods.

(r) Report the designed and adjusted supply, return and outdoor air flow at point of mixing, and include temperatures recorded during the test and adjustment process.

(s) Hydronic System Procedure - Heating or Cooling Systems

(i) Adjust water systems to provide design quantities.

(ii) Effect system balance with automatic control valves fully open to heat transfer elements.

(iii) Effect adjustment of water distribution systems by means of balancing cocks, valves and fittings. Do not use service or shutoff valves for balancing unless indexed for balance point.

(iv) Use calibrated venturi tubes, orifices, or other metered fittings and pressure gauges to determine flow rates for system balance.

(v) Where Constant Flow Devices are installed, confirm that the device flow rates match the required equipment flow rates, and confirm that the total pressure drop across the devices are sufficient to provide the desired flow.

(t) Elevator Sump Pump Test Procedure

(i) Disable pumps and measure sump dimensions.

(ii) Fill sump with an adequate amount of water to allow pumps to run for a minimum of 1 minute.

(iii) Enable pumps and allow to run for a minimum of 1 minute. Record run time. Measure change in water depth and use to calculate average sump pump flow rate.

(iv) Ensure that the system is operational when the test is complete.

(u) Domestic Water System Test Procedure

(i) Adjust domestic hot water recirculating water systems to provide design flow conditions at all adjustable balance valves.

(ii) Include in compliant hydronic report or submit a separate report.

8.4.2 Heating

8.4.2.1 Basic Requirements:

(a) The HVAC systems will maintain the space temperature levels as required by the SOR, of this Schedule 1 and Good Industry Practice and will have the capacity to restore the Building from the setback temperature to the occupied temperature (3°C offset between occupied and setback) within 4 hours.

(b) The heating water design supply temperature will be 46ºC, while the design return temperature will be 35ºC.

(c) Provide expansion compensation for heating piping.

(d) The primary heat source will be the DHRC. The DHRC will draw heat either from the geoexchange system or by energy recovered from cooling operations. The boiler system is intended as backup heat during periods where sufficient heat is not available from the geoexchange field, or for periods when the DHRC is down for servicing.

(e) Provide multiple hot water heating devices to provide all necessary heating, for the Building to meet the standards as required. A heating water buffer tank will have a two-pipe configuration. Buffer tanks with three or more connections to the hydronic system will not be accepted.

(f) Equipment shall be products of manufacturer regularly engaged in production of such units who issues complete catalogue data on such products, factory built and tested.

(g) Terminal heat transfer units and unit heaters shall be floor or ceiling mounted fan assisted heaters, complete with coated casing (graphite grey). Coils shall be copper tube with aluminum fins. Tangential type fan(s) in each unit, dynamically and statically balanced and suitable for high efficiency and quiet running. Use totally enclosed EC motors and sealed sleeve type bearings requiring no lubrication. Each unit to have one 0-10V interface for BMS speed control. Equipment to be 16 gauge, pencil proof air outlet and sloped top where indicated as heavy-duty on the Appendix 1B – Room Data Sheets.

(h) Insulate all sections of air handling equipment supply, return and outdoor air.

(i) The Dedicated Heat Recovery Chiller (DHRC) shall provide the functionality of a heat recovery chiller as well as a water-to-water heat pump. It shall recover heat from cooling loads to be used in heating loads, it shall draw heat from the geoexchange field for use in heating loads, and it shall provide cooling by rejecting heat to the geoexchange field. The DHRC must be capable of recovering heat from cooling loads that coincide with heating loads while also using the geoexchange field to balance out asymmetric loading. The DHRC shall incorporate scroll-type compressors and shall consist of modules in the configuration indicated in the equipment schedules. Each refrigerant circuit shall consist of an individual compressor, common dual circuit condenser, dual circuit evaporator, electronic expansion valve (thermal expansion valves not acceptable), and control system. Each circuit shall be constructed to be independent of other circuits from a refrigeration and electrical standpoint. The multi-circuit dedicated heat recovery chiller must be able to produce hot water even in the event of a failure of one or more refrigerant circuits. Circuits shall not contain more than 15 lbs. of R-410a refrigerant. The DHRC shall be equipment with a micro-processor based controlled. Compressors shall be staged based on a signal from the Building Management System. All safeties must stay in place. Staging systems based on water temperature reset are not acceptable. Provide isolation valves for servicing strainers located in equipment. Provide adequate service clearance for removal of screens.

(j) In-slab radiant heat systems identified on Appendix 1B – Room Data Sheets to be installed with minimum R-15 rigid insulation suitable for below grade use. Fasten tubing to wire mesh or reinforcing bars in accordance with the PEX tubing manufacturer's installation requirements. Provide edge insulation along perimeter of slab down to 300 mm below slab depth. Radiant design to not exceed flooring manufacturer's temperature limitations or 28.5°C, whichever is lower. Install at consistent depth with sleeves at expansion joints. Provide radiant zone pump with bypass to allow continuous in-slab flow independent of building heating circulation. Conceal manifold, zone pump and accessories behind access panel in wall so is that it can be easily accessible for service.

8.4.2.2 Performance Criteria

(a) Boilers and heat pumps will be suitable for the Site environmental conditions.

(b) Boilers will be capable of operating at a minimum AFUE efficiency of 93% at all firing rates. Aluminum heat exchangers are not allowed. The manufacturer's representative shall tune and adjust the control system to work in harmony with the mechanical system, ensuring that the boiler or boiler bank operates correctly, does not "hunt", and shows appropriate response speed under all load conditions. Control by leaving water temperature setpoint shall not be permitted. Each boiler's control system shall accept the following inputs from the Building Automation Systems:

(i) Enable

(ii) Firing Rate Modulation

(c) All heating coils and unit heaters that receive direct outdoor air are to be sized to provide minimum 15°C supply air with an outdoor air temperature -20°C. Heating coils downstream of this coil are to be sized to provide 35°C with a tempered outdoor air temperature of 15°C.

8.4.3 Air Conditioning

8.4.3.1 Basic Requirements

(a) Mechanical cooling will be provided in all regularly occupied spaces.

(b) Mechanical cooling will also be available continuously for all areas of the Facility containing continuous internal heat gains such as electrical and Communications Rooms.

(c) All Communications Rooms will be supplied with dedicated air conditioning systems. Targeted cooling, with cooling located within the row of racks, will be employed in the Main Telecommunications Rooms. Refer to Appendix 1B - Room Data Sheets for specific temperature setpoints. If not specifically noted, these rooms will be maintained between 18°C and 23°C.

(d) The fluid in this system is 20% propylene glycol.

(e) All chilled glycol or water buffer tanks will have a two-pipe configuration. Buffer tanks with three or more connections to the hydronic system will not be accepted.

(f) Equipment shall be products of manufacturer regularly engaged in production of such units who issues complete catalogue data on such products, factory built and tested.

(g) Terminal heat transfer units shall be floor mounted fan assisted fan coils, complete with coated casing (graphite grey). Coils shall be copper tube with aluminum fins with stainless steel drain pan. Tangential type fan(s) in each unit, dynamically and statically balanced and suitable for high efficiency and quiet running. Use totally enclosed EC motors and sealed sleeve type bearings requiring no lubrication. Each unit to have one 0-10V interface for BMS speed control. Equipment to be 16 gauge, pencil proof air outlet and sloped top where indicated as heavy-duty on the Appendix 1B – Room Data Sheets.

(h) Insulate all sections of air handling equipment supply, return and outdoor air.

8.4.3.2 Performance Criteria

(a) Where required, provide sufficient space cooling capacity to meet the required indoor design temperatures outlined in applicable Standards while using the July 2.5% outside design wet and dry bulb temperatures outlined in the BC Building Code.

(b) Ensure that no air within the air conditioning system, outside of the central air handling equipment, drops below its dew point temperature.

(c) Design systems to prevent cooling supply air in any condition from reaching the occupied zone at temperatures low enough to create discomfort.

8.4.4 Ventilation

8.4.4.1 Design Principles

(a) Provide all necessary ventilation for the Building per BC Building Code

(b) Return air paths will be arranged to avoid ‘cross talk’ between spaces.

(c) Ductwork static pressure in ducts less than 0.50 kPa and will not exceed 1500 feet per minute.

(d) Provide an HVAC system that maintains pressure relationships as identified in the Appendix 1B – Room Data Sheets between various areas of the Building.

(e) Provide fans with Variable Frequency Drives (VFDs) for energy savings under part-load conditions.

(f) All motors (fans and pumps) 1 HP and larger will be provided with a VFD.

(g) Provide grounding rings on all motors with VFD’s (fans and pumps).

(h) All VFD motors greater than 10 HP (fans and pumps) will have 5% THD input current harmonic filter, designed such that no individual current harmonic will be greater than 4% at full load operation. The supply of line reactors (such as 3% DC reactors or 5% AC reactors), without filters, is not acceptable.

(i) Provide air filtration in accordance with all applicable standards. MERV-13 filters are to be provided for all ventilation systems.

(j) The roof mounted energy recovery units shall be self-contained, factory assembled and prewired, consisting of roof mounted cabinet and frame, variable speed supply and return fan, controls and air filter. Energy recovery element shall consist of two aluminum mass cassettes. Dampers will allow airflow to periodically change direction through the cassettes.

(k) The ventilation system shall be designed to ensure continuous airflow to zones such as washrooms and custodial rooms as required by ASHRAE 62.1, while allowing relief air flow to vary as required to maintain building pressurization.

(l) Occupant load to determine outdoor air values for specific zones are shown in Appendix 1B – Room Data Sheets. Total outdoor air delivery to the school building to satisfy the occupant capacity listed in 2.8.1 as Students and School Staff. Outdoor air requirements for spaces with dedicated energy recovery ventilation identified in the Room Data Sheets cannot contribute to the total outdoor air delivery determination for Students and School Staff. Total outdoor air delivery to the NLC building to satisfy the occupant capacity listed in 2.8.1 as NLC Staff and NLC Users.

(m) The HVAC systems must include a dedicated active relief air system.

(n) Active relief air systems consist of a relief fan that modulates to control building pressure when demand control ventilation and elective exhaust systems are present. Modulating relief fan systems must be controlled by building pressure. The outdoor reference pressure shall be obtained from outdoor air ports on at least four sides of the building. The ports shall be connected with individual tubes that are run to a short 100 mm diameter PVC accumulator pipe. The outdoor reference pressure port is connected to the accumulator pipe. The indoor reference pressure shall be measured at floor level near the main entrance.

(o) All outdoor air delivery is to be provided through energy recovery ventilators at the below efficiencies as determined by the temperature ratio in the generic effectiveness formula in CSA C439 Laboratory methods of test for rating the performance of heat/energy-recovery ventilators.

(i) Common outdoor air delivery to fan coils and air handling units, 84% at a winter design outdoor air temperature of -20°C

(ii) Dedicated outdoor air delivery in roof mounted air handling units, 67% at a winter design outdoor air temperature of -20°C

(iii) Outdoor air and relief dampers are to be low leakage insulated dampers at a maximum of 15.2 l/s/m2 at a differential pressure of 0.25 kPa.

(p) Total flow rate of relief exhaust systems to provide a 2.5 Pa positive pressurization of building, maintaining proportionality of relief exhaust grilles.

(q) Insulate all sections of air handling equipment supply, return and outdoor air.

(r) All outdoor air, relief air and exhaust air dampers are to have a maximum of 15.2 l/s/m2 at a differential pressure of 0.25 kPa.

8.4.4.2 Performance Criteria

(a) All equipment below the roof for supply air, return air and general exhaust systems will be located inside the building envelope.

(b) Rooftop equipment will be screened or hidden from public view from any angle on the ground within 200 meters of the Building in a manner consistent with the exterior architectural façade treatment.

(c) Provide outdoor air intakes, cooling coil drain pans, air handling units, ductwork, and all other interconnected components to prevent moisture and contaminants from collecting within the system. Provide sufficient access panels to allow for inspection, cleaning and maintenance.

(d) Fresh Outdoor air intakes will be located to not entrain contaminants from outdoor sources. All intakes will be located in areas that are not accessible by the public and will not be located near exhaust air outlets.

(e) All supply, return transfer, and exhaust air will be fully ducted to the space being served.

(f) Insulate all ductwork in accordance to BC Building Code and ASHRAE 90.1. Provide canvas service jacket on all exposed insulation inside and up to 3 meters above finished floor in mechanical rooms.

(g) Ventilation systems serving classrooms will be ducted to provide uniform air distribution in the space.

(h) Low level return air grilles will be employed to minimize stratification. Return ductwork is sized for 100% return air flow to accommodate specified air flow during unoccupied mode. Refer to Appendix 1B – Room Data Sheets for rooms where low level return grilles are required.

(i) Acoustic transfer ducts will be used to transfer return air from closed room to common areas where not shown on plans.

(j) All outdoor air make-up for exhaust systems in 17.01 Mechanics Shop, 19.01 Wood Construction Shop, 19.03 Finishing and 20.01 Metal Shop is to be delivered through roof mounted air handling units. Natural gas fired make up air for these exhaust systems is not approved.

8.4.5 Exhaust Systems

8.4.5.1 Design Principles

(a) Provide exhaust fans and locate them as close as possible to the end of the exhaust ductwork systems. Ensure that the fans will be readily serviceable and are separated from spaces that house other mechanical equipment.

(b) Provide exhaust systems for Automotive Shop areas as identified in the Appendix 1B – Room Data Sheets controlled by carbon monoxide and nitrogen dioxide sensors tied to BMS.

(c) Provide exhaust in elevator shaft and elevator equipment room to maintain equipment within manufacturer's required ambient temperatures.

(d) Provide additional special exhaust systems as outlined in Appendix 1B - Room Data Sheets.

(i) Exhaust ductwork from shower areas and high-moisture areas will be fabricated from aluminum.
(ii) Fumehood exhaust ductwork will be 316L welded stainless steel.

(iii) Sawdust Collector system to be rectangular design with tube style filters and mechanical shaker type cleaning. Collector shall be supplied with a minimum Class II, backward inclined radial tipped belt driven fan for mounting on the clean side of the filter, complete with Hi-Eff TEFC motor, inspection door, and direct drive mounting. Provide complete system with independent controls and ducting to workshop equipment. Dust collection system will have filtration rated to 1-micron and be canister type. The system will recirculate make up air back into the space. Make up shall incorporate 2" thick pre-filter and 12" thick final filter with 1" header.

1. Collector to be supplied with explosion relief venting as appropriate for the location engineered to direct the blast to exterior room vent.

2. Woodshop exhaust ductwork will be high pressure ductwork in accordance with SMACNA – HVAC Duct Construction Standards for Class II, minus 3 kPa. (12 "wc), 22 m/sec. (4500 fpm), Seal Class A. Exhaust ductwork will be smooth internally and continuously welded.

3. An inline discharge silencer shall be supplied by the dust collector supplier installed by the contractor. The pressure drop shall not exceed 100 Pa and the minimum insertion losses in the third, fourth and fifth octave bands shall be as scheduled.

4. High speed abort damper with weather cover.

5. Spark detection system.

(iv) A dedicated exhaust fan will be provided for smudging in the Indigenous Education room and in the Indigenous Language & Cultural Centre as identified in the Appendix 1B – Room Data Sheets. Exhaust systems will be manually activated with a wall switch and timer and provide a minimum of 8.5 air changes per hour. Exhaust intake to have acoustic attenuation to limit the exhaust system noise to 40 dB.

(v) Provide retractable hose reels exhaust system where required for vehicle exhaust in the Automotive Shop for two individual vehicle stations. Provide shop exhaust for vehicle emissions work areas complete with a gas detection system. Conduct commissioning operations and tests to confirm the detection systems are properly installed, calibrated and operational with on-site start up by manufacturer certified technician.

(vi) Roof mounted in-line centrifugal exhaust fans will be provided for a local exhaust systems in the Metal Shop as identified in the Appendix 1B – Room Data Sheets. The duct system located in the building is to be negative pressure. Category A FFE shown in Appendix 1F and listed below is to be provided with local exhaust capture following the design guidelines of the American Conference of Governmental Industrial Hygienists –Industrial Ventilation: A Manual of Recommended Practice for Design, 31st Edition:

1. CNC Milling Machine, Straight Takeoff local exhaust capture
2. Crucible Furnaces, Canopy Hood local exhaust capture
3. Forge, Canopy Hood local exhaust capture
4. MIG Welder, Slotted Type local exhaust capture
5. Plasma Cutter, Downdraft local exhaust capture"

(vii)A dedicated explosion proof exhaust fan will be provided for the Finishing Room in the Woodworking Shop as identified in the Appendix 1B – Room Data Sheets.

1. Fume hood/finishing room exhaust fans shall be suitable for corrosive atmospheres with motor mounted out of exhaust stream with external air source forced cooling, non-spark, up blast configuration. Ductwork to maintain 7.5 m/s.

2. Fume hood installation to be certified by professional engineer.

(viii) Remote fans to serve all range hoods “RH”. Remove manufacturer supplied fan from range hood. Where served by a dedicated remote fan, the range hood fan switch is to operate the exhaust. Where a single fan serves multiple range hoods (Home Ec as identified in the Appendix 1B – Room Data Sheets) a local switch provided by controls will operate exhaust. Lights in range hood to remain operational from original switch.

(ix) Belt Drive Re-Tensioning:

1. Immediately prior to takeover of the equipment by the Owner for their own use, perform re-tensioning of all belt drive systems.

2. Provide a completed report. Use trained and competent personnel for this activity.

8.4.6 Noise and Vibration

8.4.6.1 Design Principles

(a) Design and install all mechanical systems to prevent sound and vibration transmission between spaces, and transmission from mechanical equipment to the spaces. Provide sound attenuation to limit sound levels in accordance with Appendix 1C - Acoustical Chart. Design and install mechanical systems located at or near any exterior wall to minimize sound transmission to the neighboring community.

(b) Provide vibration isolation devices on all equipment with rotating components.

(c) All hung equipment will utilize spring isolators designed for the weight and vibration characteristics of the equipment.

(d) Provide flexible connections where needed to isolate mechanical equipment sound and vibration from ducting, piping and electrical wiring systems.

(e) Provide flexible connections where needed to isolate mechanical equipment sound and vibration from ducting, piping, and electrical wiring systems.

(f) Provide acoustic insulation in supply and return ducting to a minimum of 3m from any air handling equipment.

(g) All passive air transfer ducts shall be acoustically lined.

(h) Arrange ductwork serving offices or conference rooms to prevent sound transfer between rooms.

8.4.6.2 Performance Criteria

(a) Ensure duct silencers meet or exceed the requirements of the ductwork for cleanliness and inspection.

(b) Utilize fiber free internal insulation.

(c) Prior to completing the Design, provide an acoustical consultant's report demonstrating that the specified interior noise requirements will be met.

(d) HVAC, plumbing and electrical systems will not exceed the Noise Criterion (NC) as specified in Table 8.3.6.2-1.

Figure 1-2

Space Type	Noise Criterion – NC
Drama Room	20-25
Music Rooms	30-35
Sensory Room	20-25
Classrooms	30-35
Recording / Composition Room	20-25
Audio Recording Room	20-25

8.4.7 Commissioning of Mechanical Systems

8.4.7.1 The Commissioning process will be applied to all mechanical components, equipment and systems and sub-systems.

8.4.7.2 The mechanical commissioning scope will include:

(a) demonstration of equipment and systems operations.

(b) instruction seminars for Staff designated by the Owner.

(c) system start-up, testing and operational checking.

(d) system failure mode testing; and

(e) system back-up mode testing.

8.4.8 NLC Childcare Spaces – Additional Prescriptive HVAC Requirements

8.4.8.1 The NLC childcare spaces shall be heated and cooled by a heat pump system. This may be either via connection to the central geoexchange thermal plant or via standalone air source heat pumps. Energy recovery ventilators shall be used for ventilation.

8.4.8.2 The systems shall be zoned to permit the NLC childcare spaces to operate on differing occupancy schedules from the remainder of the Facility.

8.5 Division 24 – Commissioning

8.5.1 General

8.5.1.1 Work Included

(a) Commissioning and final adjustment of all systems provided or installed under Division 21, 22,23 and 25.

(b) Verification of building automation system sequences, schedules, and normal operation.

(c) Verification of correct normal and emergency operations for all systems provided or installed under Division 21, 22,23 and 25.

(d) Verification of balancing reports.

(e) Direction to the contractors for minor system revisions during the construction process.

(f) Direction to the contractors for system adjustment for all systems provided or installed under Division 21, 22,23 and 25.

(g) Coordination of system testing and balancing with other systems requiring set-up by manufacturers.

(h) Coordination of contractor and manufacturer presented training sessions for all systems and equipment provided or installed by Division 21, 22,23 and 25.

(i) Participation in the handover of systems to the Owner.

(j) Development of a scheduled, planned and certified handover process of systems to the Owner.

(k) Training and instructions to Owner of all systems provided or installed under Division 21, 22,23 and 25.

8.5.1.2 System Data

(a) Reports shall include balance and equipment data listed in S.I. (Metric) units.

(b) Report data shall include system description, manufacturer, arrangements, motor size, electrical characteristics, equipment size, design and actual temperature, flows, RPM, power, amperage, a pressure (air and water, static and velocity), water temperature, room temperature and humidity, outdoor temperature and humidity, etc.

(c) Review requirements with the Balancing contractor.

8.5.1.3 Submittals

(a) Equipment start up reports: refer to requirements specified in other Sections of this specification.

8.5.1.4 Quality Assurance

(a) Commissioning of mechanical systems shall be performed by an agency that specializes in this type of work.

(b) Technicians performing the work shall be experienced in projects of similar scale and nature.

8.5.1.5 Products

8.5.1.6 Operation and Maintenance Manuals Materials

(a) Ensure copies of all shop drawings, reports and forms, materials, etc., required to complete the documentation are provided.

(b) Prepare proper documentation to instruct the Owner in the operation and preventative maintenance of equipment and systems provided. Complete and turn over documentation prior to Substantial Performance inspection.

8.5.1.7 Balance Reports

(a) Coordinate submission of draft copies of reports prior to the end of Phase One Commissioning.

(b) Ensure specified number of final copies for inclusion in Operating and Maintenance Manuals are provided.

8.5.1.8 Equipment Test Reports

(a) Use or modify manufacturers' reports. Test and adjust equipment and systems as specified, and as required by the manufacturer. Ensure that manufacturers' start up reports are complete and acceptable.

(b) Provide detailed listing of equipment set up parameters “as left.”

8.5.1.9 Commissioning Services – General

(a) Prior to start of the commissioning process, the contractor shall submit to the Engineer, the following:

(b) Proposed commissioning schedule and procedures.

(c) Forms and checklists showing the entire list of actual systems and equipment, including all operations and set points that will be checked and reported.

(d) Personnel and equipment that will be used.

(e) Pre-commissioning Meeting: The Commissioning Agent shall organize a meeting with the Engineer, heating sub-contractor, plumbing sub-contractor, controls sub-contractor, major equipment suppliers (boilers, air handlers, heat exchangers, rooftop units, automatic sprinklers, kitchen equipment) prior to the start of Phase One Commissioning. The meeting will establish and clarify the requirements and schedule of each member of the construction team, and the method and format of certification and test reports.

(f) Descriptive Data: Review design concepts and general function of each system including associated equipment and operation cycles. Confirm listing of flow and terminal measurements to be performed.

(g) Procedure Data: Outline procedures for taking test measurements to establish compliance with requirements. Specify type of instrument to be used, method of

instrument application and correct factors.

8.5.2 Execution

8.5.2.1 Construction Period Services

(a) The Commissioning Agent will attend at the site during the construction period. The number of site visits shall be as required, and shall be coordinated with the construction process to provide the following:

(b) Instruct the Division 21, 22,23 and 25 contractors with respect to configuration changes required to achieve the specified system performance.

(c) Review all specified water flows and compare required flow to balancing and metering valve, or automatic valve selection.

(d) Instruct the Division 21, 22,23 and 25 contractors with respect to valve selection and sizing prior to installation.

(e) Provide written report on recommendations.

8.5.2.2 Commissioning Phase One - Pre-Commissioning

(a) Prior to commencing commissioning tasks on any system, confirm or provide the following:

(b) Certification that the subject systems are ready for the commissioning process.

(c) Permanent electrical connections are complete and accepted by the Electrical Engineer.

(d) All safety controls are complete and operational.

(e) All operating controls are complete and activated.

(f) Flushing and cleaning of piping systems related to the subject systems have been completed.

(g) Ductwork related to the subject systems are cleaned, and satisfactory filters are installed.

(h) Refrigeration systems related to the subject systems are fully charged and commissioned.

(i) Related vibration isolation components are properly adjusted.

(j) Belt and coupling drive combination specifications and calculations to confirm selection.

(k) Schedule of all electric motors provided under this division, identifying manufacturer, model number, power rating, frame size, voltage, speed, and efficiency.

(l) Fire sprinkler systems are complete and activated.

(m) All permits are in hands of the contractor.

(n) Provide written reports on all necessary systems. Do not proceed to the next phase, without written acceptance of this phase, by the Engineer.

8.5.2.3 Commissioning Phase Two - Commissioning Operations

(a) As each system is started and tested, and balancing and adjusting is underway or completed, the overall performance of the components and systems, including the controls, shall be tested, properly adjusted, verified under all operating conditions and reported.

(b) Commissioning tasks shall include but not be limited to the following:

(c) In the company of equipment suppliers and the Division 21, 22,23 and 25 contractors, each piece of equipment provided by this Division shall be started and checked for correct operation and for correct interlocking and parallel operation with other equipment and systems.

(d) Activation of all components, systems and sub-systems, both manually and through the automatic control systems.

(e) Testing and adjustment of all components, systems and sub-systems.

(f) Adjustment and securing of all adjustment devices such as dampers, balancing valves, etc.

(g) Adjustment and calibration of all control and safety devices.
(h) Adjustment and calibration of variable air volume control devices on air handling systems.

(i) Adjustment and calibration of domestic water heating, temperature control devices and circulation systems.

(j) Adjustment, calibration and securing of variable air volume control devices on duct systems.

(k) Adjustment and calibration of controls on variable air volume supply and return fan capacity control devices and systems.

(l) Adjustment and securing of all air inlet or outlet balancing devices.

(m) Adjustment and setting of automatic controls for accurate response and precise sequencing.

(n) Confirmation that system's operation in fire mode is correct. Detailed checking and reports for fire alarm initiated fan shutdown, smoke damper activation, smoke removal system activation, corridor or stairwell pressurization, etc.

(o) Confirmation that all pressure maintenance, alarm and trouble annunciation devices on the fire protection systems are properly adjusted, and properly connected to the fire alarm panel. These tests are not to be commenced until the fire alarm panel is complete and tested as specified in the electrical specification. Certification of the devices provided under Division 21, 22,23 and 25 is to be completed by actual operation of the fire protection system. Testing continuity of the device and wiring is not satisfactory.

(p) Adjustment of vibration isolators and earthquake restraints.

(q) Operation of fire dampers.

(r) Testing of fire protection monitoring control and alarm systems.

(s) Provide written reports on all necessary systems. Do not proceed to the next phase, without written acceptance of this phase, by the Engineer.

8.5.2.4 Commissioning Phase Three - Verification of Commissioning

(a) Verification of commissioning by the Engineer shall not commence until Phase Two Commissioning is totally complete.

(b) Operate and demonstrate entire system operation with the Engineer present. The Engineer will indicate acceptance of the tests by initialing items on the checklists. The commissioning process will not be considered complete until all system components are tested and accepted in concert with all other systems.

(c) Submit test reports, test completion certificates, and related data at the time of requesting the commencement of the verification phase.

(d) The verification process will include, but not be limited to the following:

(e) Locating and demonstrating the opening capability of all access panels and confirming that the record drawings show these devices in the correct location.

(f) Locating and demonstrating the accessibility and setting of all hydronic or chilled water balancing valves, and confirming that the record drawings show these devices in the correct location.

(g) Locating and demonstrating the accessibility and setting of all air flow balancing dampers, and confirming that the record drawings show these devices in the correct location.

(h) Locating and demonstrating proper operation of fire dampers, randomly selected by the Engineer, and confirming that the record drawings show these devices in the correct location.

(i) Verifying proper response and sequences for terminal equipment control valves and related hydronic control valves.

(j) Demonstrate noise levels from air handling systems in all modes of operation.

(k) Verifying operation of all systems and components in all sequences, and under varying loads. The commissioning agent will require thorough knowledge of the control system in order to adjust and reset operating ranges in order to force the systems into required demonstration modes.

(l) Verify that the primary plant systems (boilers, chillers, pumps, etc.) operate in a stable fashion under partial load without hunting or short cycling.

(m) Verifying all DDC system features.

(n) Verifying all mechanical systems control features.

(o) Verifying correct operation of all refrigeration, humidification, evaporation, convertor and heat generating systems.

(p) Demonstration of all pump systems, including pressure and amperage readings. The commissioning agent must have performance curves available during the demonstration, for comparison of the pressure and amperage readings.

(q) Demonstration of all coils and heat exchange systems, including both side inlet and outlet temperature readings. The commissioning agent must have performance specifications available during the demonstration, for comparison of the temperature readings.

(r) Demonstration of inlet and outlet temperature readings on heat transfer elements, randomly selected by the Engineer. The commissioning agent must have performance specifications available during the demonstration, for comparison of the temperature readings.

(s) Operation of all unit heaters and forced flow heaters.

(t) Operation of all exhaust fan systems.

(u) Fill status and pressure settings on expansion tanks.

(v) Operation and sequencing of boilers, including flue gas tests, and all safety devices.

(w) Demonstration of domestic water re-circulation and tempered water control systems.

(x) Demonstration of all fire protection system monitoring, control and alarm features.

(y) Provide written reports on all necessary systems. Do not proceed to the next phase, without written acceptance of this phase, by the Engineer.

8.5.2.5 Commissioning Phase Four - Demonstration, Training, Handover and Acceptance

(a) Demonstration to the Owner's designated representatives shall not commence until Phase Three services are totally completed.

(b) Substantial Performance will not be considered until the successful completion of Phase Four Commissioning.

(c) The process of Demonstration, Training, Handover and Acceptance is a planned process, requiring pre-approval of the plan and stages, and a signed statement of Acceptance by the Owner's designated representative at the completion of each stage of the process.

(d) As the project moves close to the final stages, a formal dialogue will be established by the Engineer, the Owner and the Contractor, in order to schedule times, dates and required personal for systems and equipment commissioning, demonstration and training. No Commissioning, Demonstration, or Training session shall occur at the same time as any other Commissioning, Demonstration, or Training session.

(e) The Owner will attend on the site on a scheduled basis, to inspect and review the installation. The Contractor shall arrange for all necessary and specified personal and equipment specialists to be in attendance for purposes of demonstrating and training.

(f) Obtain a signed statement from the Owner certifying that the demonstration and instruction have been given to his satisfaction.

(g) Obtain a list of all persons attending commissioning, demonstration, or training sessions, including their signatures and job title.

(h) If systems are deemed complete and acceptable by the Engineer and the Owner, the Owner will signify acceptance by signing a formal handover receipt relating to the subject system or equipment. If systems are not deemed complete and acceptable by the Engineer and the Owner, the contractor will re-schedule the session for a future time. The costs of the Engineer's and Owner's attendance at this or other subsequent sessions will be charged to the Contractor.

(i) The Engineer will issue lists of required submissions, receipts and acceptance forms, for execution by the contractor. Refer to sample forms for Handover and Acceptance included in this Section.

(j) The services to be provided by the commissioning agent and other contractors in this phase include, but are not limited to the following:

(k) Training in the normal, abnormal and emergency operation of all systems provided under this Division.

(l) Training in the programming, normal, abnormal and emergency operation of the control system.

(m) Review and instruction in the normal maintenance and operation of the fire protection systems. This training is to include thorough review of the procedures for adjustment and testing of devices, and the procedures to be followed when there is an activation of automatic systems or trouble annunciation.

(n) Review of all necessary maintenance procedures of all systems provided under this Division.

(o) Provision of a documented maintenance program covering all systems provided or modified under this contract.

(p) Review of all documents and reports created during Phases One, Two, and Three of the Commissioning process.

(q) Final certification letters from the commissioning agent, balancing contractor, controls contractors, and the Division 21, 22,23 and 25 contractor(s), that all systems are installed and operating, providing the intended service to the building.

8.6 Division 25 - Building Management System

.1 The following are abbreviations used throughout the section defining computerized control systems specified herein.

.1	DDC	Direct Digital Control
.2	BAS	Building Automation System
.3	DI	Digital Input

.4	DO	Digital Output
.5	AI	Analog Input
.6	AO	Analog Output
.7	MCC	Motor Control Centre
.8	WPS	Water Differential Pressure Switch
.9	R	Relay
.10	HWST	Hot Water Supply Temperature
.11	HWRT	Hot Water Return Temperature
.12	CHWST	Chilled Water Supply Temperature
.13	CHWRT	Chilled Water Return Temperature
.14	SP	Set Point
.15	WTS	Water Temperature Sensor
.16	RTS	Room Temperature Sensor
.17	DTS	Duct Temperature Sensor
.18	SAT	Supply Air Temperature Sensor
.19	MAT	Mixed Air Temperature Sensor
.20	RAT	Return Air Temperature Sensor
.21	OAT	Outdoor Air Temperature Sensor
.22	DPS	Differential Pressure Switch
.23	CT	Current Transformer
.24	CUR	Current Sensor, Analog
.25	OPR	Damper or Valve Operator
.26	DMP	Damper Operator
.27	CNLR	Controller
.28	MP	Monitor Proximity Switch
.29	VAV	Variable Air Volume Damper Operator
.30	VFD	Variable Frequency Drive
.31	FM	Flow Meter

.32	B-BC	BACnet Building Controller
.33	B-AAC	BACnet Advanced Application Controller
.34	B-ASC	BACnet Application Specific Controller
.35	B-OWS	BACnet Operator Work Station
.36	B-AWS	BACnet Advanced Operator Work Station
.37	DHRC	Dedicated Heat Recovery Chiller
.38	EPIV	Electronic Pressure Independent Control Valve
.39	ERV	Energy Recovery Ventilator
.40	OA	Outdoor Air
.41	EA	Exhaust Air
.42	FA	Fire Alarm

8.6.1 Description of Control System

8.6.1.1 BACnet. The controls system shall consist of a high-speed, peer to peer network of ANSI/ASHRAE Standard 135 native BACnet devices. The control system shall incorporate input/output devices, mechanical and electrical automatic control devices, enclosures, power supplies, interconnecting conduit, and cabling.

(a) BACnet hardware shall be BTL listed.

(b) All BACnet units shall be in S.I. (Metric) and shall match the project units used in the schedules and drawings. If any doubt exists, contact the Engineer.

(c) BACnet Connectivity shall be IP based.

8.6.2 Design Principles

8.6.2.1 The installation shall conform both to manufacturer's recommended procedures, Canadian Electrical Code 2021, and to the approval of authorities having jurisdiction. Equipment shall be installed to be accessible by service personnel. Equipment shall be installed such that it does not interfere in any way with access to adjacent equipment and personnel traffic in the surrounding areas.

8.6.2.2 The installation shall have direct control over unit operation and not rely on control over equipment manufacturer proprietary protocol.

8.6.2.3 Provide a Building Management System (BMS) to perform the following functions:

(a) automatically operate, monitor and control all mechanical systems and equipment to meet the requirements of this Schedule 1;

(b) display building related alarms at a BMS control center and through a remote internet connection.

(c) allow provision for external monitoring by the Owner including all associated

hardware and software.

(d) Historical Data Collection

(i) Provide on-site trend log archiver on the BACnet network.

(ii) Built-in UI for feedback, operational status, and configuration.

(iii) Auto backup to external storage device.

(iv) Integrated to BACnet Operator Work Station and BACnet Advanced Operator Work Station.

(v) Storage of data for up to five years.

(vi) Auto prune of user definable aged data.

(vii) 2500 trends base capacity.

(viii) Coordinate location with Owner. Determine data center vs local mounting in control cabinet. If mounted locally, provide sufficient ventilation to keep enclosure within environmental requirements of the data collector.

(ix) Once the systems have been commissioned and all components are operational, provide trend logs over a minimum period of ten days for all rooms, zones, primary systems, terminal systems, and any other systems required to confirm correct BMS operation. All points must be trended using a colour display format, complete with legend. Use a multi-trend system to display set points and measured parameters for individual systems on the same page. Trends shall be recombined and resubmitted if the format is deemed to not be acceptable by the engineer. Trend objects shall include setpoints, inputs, and outputs to show the effect of program operation. Provide a written analysis of the trend logs. Indicate problem areas and steps taken to correct operation. Substantial Performance will not be granted without this analysis. Alter programming, tune control loops, adjust damper response, verify sensor calibration, adjust dead bands etc. Repeat the above process until trend logs show that systems operation is acceptable and within tolerances. Submit in PDF format.

(e) BMS to integrate with the Facility's electrical and communication systems including FA, lighting, UPS and security for monitoring and alarming.

(f) annunciates building and equipment alarms, including FA, security alarms, lighting, UPS, and switchgear alarms; and

(g) monitor equipment status, temperature, humidity, and alarms in Mechanical/Electrical Service Spaces as identified in the Appendix 1B – Room Data Sheets.

(i) The BMS will allow monitoring and operation of the entire Facility from a single location and secure remote Internet connection.

(ii) The BMS will be a completely integrated (front-end and back-end) Native BacNET DDC system.

(iii) The BMS will be an independent system separate from the Facility's FA and other control systems.

(iv) The BMS will be provided as a complete package from one manufacturer. A composite system from several manufacturers will not be permitted.

(v) The BMS will be a completely independent LAN from the School's LAN and will be monitored via remote access VPN through one common firewall.

8.6.3 Performance Criteria

8.6.3.1 Work specified in this Section shall be performed by qualified technicians, experienced and skilled in the tasks of installing and checking out the components, wiring and systems installed.

8.6.3.2 Programming

(a) With established clients, maintain style and substance of previous projects, unless noted otherwise.

(b) This trade is expected to be able to observe and optimize the operation of the subject systems based on historical context and the specific requirements of this project.

(c) Programs should be fully commented for ease in understanding the logic, particularly for those not involved in the present project.

8.6.3.3 Software and Documentation

(a) Provide the most recent version of the B-OWS/B-AWS software available.

(b) The Owner warrants that the software will not be duplicated for other purposes, however, the requirements of this section are to be met without a requirement for the Owner or the engineer to enter any other undertaking or certification in this regard.

(c) During the first-year warranty period, the controls system supplier shall maintain duplicate software back-up programs via remote connection or by attending site at the request of the Owner.

(d) Provide fully operational and unrestricted access for the HVAC control system software and documentation to the Owner, for the unconditional operational and maintenance use by the Owner.

8.6.3.4 Controllers

(a) Application Controller:

(i) B-AAC shall be fully free programmable and shall not be limited to predetermined sequences.

(ii) B-AAC to have communication ports for connection to sensors or networks. B-AAC may be optionally configured for connection to RS232 network.

(iii) Mount controllers in control cabinets.

(iv) Ensure cabinets have sufficient ventilation to prevent heat buildup.

(v) Label controllers with identifying names and addresses.

(b) Building Controller:

(i) B-BC shall provide fully distributed control independent of the operational status of the B-OWS. All necessary calculations required to achieve control shall be executed within the BC, independent of any other device. All control strategies performed by the B-BC shall be both operator definable and modifiable through the B-OWS.

(ii) B-BC to incorporate I/O expansion slots or communication port to allow expansion.

(iii) B-BC to have sufficient communication ports for a local PC, a LAN port for connection to the building LAN and a connection to other system level devices, and a COMM port for connection to sensors or subnet controllers.

(iv) B-BC to have visual status indicators on inputs and outputs, user access, CPU operation, and network communication.

(v) Provide minimum 2m of spare wire in control enclosures for each point.

8.6.3.5 Temperature Safety Sensors

(a) Install sensing tube in a serpentine pattern on the air leaving side of the heating coil.

(b) Use plastic or rubber spacers to prevent chafing of the sensing tube against the coil frame.

(c) Wire one set of contacts to the BMS system for monitoring.

(d) Hardwire second set of contacts to motor starting device for direct lockout.

(e) Locate body of temperature safety sensor in an accessible location for manual resetting.

8.6.3.6 Temperature Sensors

(a) Duct averaging sensors to have sufficient sensing points based on cross sectional area of duct. Mount in serpentine pattern across ductwork.

(b) Network sensors connected to a controller shall be on a dedicated network. No other networking devices, except sensors of the same type, are to be connected to this network.

(c) Outdoor sensor is to be located on North wall or as indicated on BMS Points Schedule.

(d) Room sensors are generally to be located as indicated on the drawings. Verify locations with Owner and engineer prior to rough-in. Locate at 1500mm AFF. Plug conduits or mounting holes to prevent convective air flow affecting the sensors.

(e) Sensing wells for immersion sensors to be turned over to the mechanical trade for installation in pipework.

8.6.3.7 Pressure Sensors

(a) Duct, building, and room pressure sensors to be mounted in a cabinet with 6mm polyethylene tubes to sensing locations. Sensing locations to be stainless steel cover type. Provide sintered bronze or porous ceramic filters on the ends of tubes that measure room and building pressure. Provide pitot style pickup for installation in ductwork. Water differential style sensors to be mounted for easy access by service personnel. Well pressure sensors with an equalization tube shall have a desiccant module to prevent ingress of humidity and liquid water. Connect all exterior points of measure in a common manifold to obtain an average pressure reading during wind conditions. The common manifold shall be 100mm PVC pipe. Terminate the interior pressure monitoring point on the main floor in a common corridor at low level.

(b) General

(i) Sensors shall be commercial grade with common availability.

(ii) Full scale accuracy of ± 1% or better.

(iii) Scaled voltage or current output as required.

(iv) Temperature compensated.

(c) Duct Pressure

(i) Single ended, gauge pressure sensing.

(ii) Select range to be 1.5x maximum expected duct pressure.

(iii) Pitot tube (static pressure) style sensing element.

(d) Water Pressure

(i) Single ended, gauge pressure sensing.

(ii) Single sensor, differential pressure sensing.

(iii) Select range to be 1.5x maximum expected line pressure. Multi-range is acceptable.

(iv) Three valve manifolds in differential arrangements.

(e) Building Pressure

(i) Single sensor, differential pressure sensing.

(ii) Range not to exceed ± 30 Pa.

(f) Room Pressure

(i) Single sensor, differential pressure sensing.

(ii) Range ± 125 Pa.

8.6.3.8 CO2 Sensors

(a) Wall or duct mount as required.

(b) Self-calibrating.

(c) Infrared absorption principle.

(d) Range: Normal occupied areas – 2000 ppm.

(e) Range: Process areas – 20000 ppm.

8.6.3.9 Current Sensors

(a) Current sensors shall vary output signal with changing current draw.

8.6.3.10 Humidity Sensors

(a) Accuracy of 2% from 10% to 90% @ 21°C.

8.6.3.11 Damper Actuators

(a) Electronic gear driven modulating or two position damper operators with spring return to fail-safe in normally open or closed position.

(b) Full range operators to be suitable for torque and mounting requirements of associated dampers.

(c) Two position actuators to have auxiliary end switches built in.

(d) Modulating actuators to produce a varying DC voltage position feedback.

(e) Modulating actuators to accept a varying DC voltage for position command.

(f) Actuator to mount to damper shaft via a two-bolt clamp.

8.6.3.12 Valves and Actuators

(a) General:

(i) Sizing:

1. 2 Position – Full line size.

2. Modulating – Pressure drop through valve shall exceed pressure drop through terminal device (coil, HXR, etc.) by no more than 125%. Provide calculated pressure drop.

3. ePiv – Size valve for 120% of current specified flow.

(b) Actuators:

(i) 2 Position – Adjustable stroke linkages. Motors sized for breakaway load. End switch if specified on BMS Points Schedule. Spring return or electric/UPS backup required.

(ii) Modulating – Actuator position adjustable via 0-10vdc or 4-20mA. Position feedback if specified on BMS Points Schedule. Spring return or electric/UPS backup required.

(iii) ePiv – Actuator position adjustable via 0-10vdc or 4-20mA. Electronic fail-

safe actuator. Feedback to indicate current GPM flow.

(iv) Tri-state – Tri-state actuators not approved for modulating service.

(c) 2 Way Bodies:

(i) Ball – On/Off control only. Bronze body. Stainless steel ball. FNPT threads.4,100 kPa rating.

(ii) Butterfly – Ductile iron body c/w polyester powder coat. Stainless steel disc. EPDM liner. 0% leakage to 1,400 kPad. ANSI-125/150 flange.

(iii) CCV – Up to 50mm - Modulating control only. Forged brass, nickel plated body. Stainless steel ball. FNPT threads. 4,100kPa rating.

(iv) CCV – 65mm or greater - Modulating control only. Cast iron body. Stainless steel ball. 0% leakage to 350 kPad. ANSI-125 flange.

(v) ePiv – Up to 50mm - Modulating control only. Forged brass, nickel plated body. Stainless steel ball. FNPT threads. 2,400kPa rating. Ultrasonic flow measurement with glycol correction.

(vi) ePiv – 65mm or greater - Modulating control only. Cast/ductile iron body. Stainless steel ball 0% leakage to 350kPa. ANSI-125 flange. Ultrasonic flow measurement with glycol correction.

(d) 3 Way Bodies:

(i) Ball – Two position control only. Forged brass, nickel plated body. Chrome plated brass ball. FNPT connections. 0% leakage, both ports, to 2,400 kPad.

(ii) Butterfly – Ductile iron body c/w polyester powder coat. Stainless steel disc. EPDM liner. 0% leakage to 1,400 kPad. ANSI-125/150 flange. Factory assembled to tee. Factory installed linkages.

(e) 6 Way Bodies:

(i) ePiv – Modulating control only. Nickel plated brass body. Chrome plated brass ball. FNPT connections. 0% leakage to 100 kPad. Ultrasonic flow measurement with glycol correction.

8.6.3.13 Variable Speed Drives

(a) Variable speed drives shall be selected to be compatible with the driven motors.

(b) Interface shall include BACnet/IP connection as well as programmable I/O ports.

(c) Adjustable carrier frequency from 1-12kHz. Nominal value 8kHz.

(d) Line reactors standard.

(e) Lockable disconnect standard.

8.6.3.14 Airflow Meter Stations

(a) Controllers shall be fully programmable.

(b) Provide tri-state damper operators with fail-in-last-place.

(c) The BAS system shall be capable of controlling pressure independent, single duct, variable air volume valves.

(d) A fully variable damper actuator shall be directly mounted on the variable air volume terminal box damper shaft. The actuator drive speed shall be variable and the actuator travel shall be continuously adjustable to prevent damage to terminal boxes due to over torquing. It shall be possible to recalibrate the damper actuator for clockwise or counterclockwise damper operation.

(e) Air flow shall be measured and controlled by an Ebtron flow measuring device. The flow transmitter shall contain an automatic on-line recalibration circuit that eliminates transducer errors due to temperature and long-term sensor drift.

(f) The operator and controller shall be capable of reporting the position of the damper and resetting the damper positions through the BAS.

(g) Air flow meters shall be thermal dispersion type accurate to within +/- 2% of reading for air flows between 0 and 25.4 m/s (5,000 fpm). The transmitter shall output a 0-10V signal proportional to air flow.

(h) Sensing elements shall be arranged in a grid configuration.

8.6.3.15 Flow Meters

(a) Line Sized – General

(b) Provide line sized ultrasonic or turbine type flow meter where shown on drawings.

(c) Provide 0-5/10VDC, 4-20mA, or data signal as required.

(d) Provide flow and BTU totalization module.

8.6.3.16 Gas Detection

(a) Stand alone gas detector for subject gas.

(b) Multi channel gas detector for multiple subject gases.

(c) Programmable dry contact outputs for fan or alarm control.

(d) Programmable analog output for connection to BMS.

(e) Splash proof when in parking garage/outside or subject to washdown.

(f) Electrochemical or catalytic operation principle.

(g) Minimum sensor life – 3 years.

(h) Field calibration possible.

8.6.3.17 Identification Labels and Tagging

(a) All components, cables, wires, devices, valves, and accessories provided by this section shall be identified by label or tag. The label or tag shall include the device identification, point name, plus a functional description. All wiring shall be tagged at both ends.

(b) All components, cables, wires, devices, valves, and accessories shall be identified by label or tag. The label or tag shall include the device identification, point name, plus a functional description.

(c) Labels - General: Engraved plastic, two colours, black background with white contrasting letters. Plates shall be minimum 40 mm high, width to suit. Letters shall be minimum 12 mm wide, 20 mm high.

(d) Labels - Emergency: Engraved plastic, two colours, red background with white contrasting letters. Plates shall be minimum 40 mm high, width to suit. Letters shall be minimum 12 mm wide, 20 mm high.

(e) Labels - Warning: Engraved plastic, two colours, amber background with black contrasting letters. Plates shall be minimum 40 mm high, letters shall be minimum 12 mm wide, 20 mm high.

(f) Tagging - Conductors: Vinyl cloth or self-laminating pre-printed label.

(g) Tagging - Miscellaneous Devices: Valves, actuators, or other field equipment shall be identified using printed labels on suitable media, inserted in clear baggage tags, secured by chain or strap.

8.6.3.18 Interlock Key Switches

(a) Mount key switches in accessible locations. Utilize single gang device box or plaster ring. Coordinate and confirm location with Owner. Key operated switch equal to ALCO MPG 106 F, single pole, double throw. Brushed stainless steel cover plate. Provide lock set and tumbler. Match existing. Final keying and changes by Owner.

8.6.3.19 The BMS will be connected to UPS power mounted off floor on strut rack. Ensure supplied UPS does not have a self-test feature. Provide plug in arrangement for controls to allow bypass of UPS in the event of failure.

(a) Uninterruptible power supply for all BMS devices and controllers. UPS to be sized to handle connected load. Minimum 30-minute runtime. Nominal input voltage 120 vac, single phase. Nominal output voltage 115 vac single phase. Unit to have full time EMI/RFI filtering. Audible noise to be less than 40 dBA 1 meter from unit. UPS to be line interactive with boost and buck capabilities.

8.6.3.20 All conduit pathways required for control wiring and for BMS integration will not be run overhead or exposed. These will be consolidated with the electrical duct banks.

8.6.3.21 Control Cabinets

(a) Provide heavy gauge, surface mount steel or aluminum panels with hinged access door to house control equipment. Cabinets shall be mounted on solid structure, free from vibration and in an accessible location.

(b) Cabinets shall be mounted with the clearance and provision for future additions to the system. Conduit entry shall be from the top or bottom only. All wiring within the cabinet shall be run in wire ducting or raceways. Provide labels for exterior of cabinet.

(c) Enameled finish.

(d) Bare aluminum finish.

(e) Common keyed locks.

(f) Terminal strip connection for external wiring, transformers, etc.

8.6.3.22 Failsafe components will be hard-wired to provide reliable operation in all circumstances.

8.6.3.23 Zoning for HVAC systems will be based on occupancy, room location within the Facility, room orientation, and thermostatic room loads.

(a) Each classroom will be a dedicated zone.

(b) No more than 3 individual offices on a single control zone provided each room is less than 20m2.

(c) Any enclosed room larger than 20m2 will be provided with a control zone.

8.6.3.24 The BMS will monitor alarms for essential building and life safety systems. Provide ability to direct alarms to an e-mail address and an alpha numeric pager. Alarms include:

(a) FA system for alarm, supervisory and trouble.

(b) all temperature and humidity alarms resulting from set point deviations.

(c) failure of any major HVAC or plumbing equipment.

(d) all alarms relating to the fire protection system; and

(e) UPS, emergency power systems (if provided). Upon activation of an alarm, notify the Owner.

8.6.3.25 The BMS documentation will include a detailed narrative description of the sequence of operation of each system.

(a) Point naming shall conform to client requirements.

(b) Update points list to record drawing condition.

8.6.3.26 User interface will be graphical in nature with animated graphics to indicate equipment operation. Graphics will be grouped in systems and in departments. Generate a pop-up window on the browser display panel with audible alarm, informing operator that an alarm has been received.

8.6.3.27 The BMS will only be accessible by personnel authorized by the Owner.

8.6.3.28 Provide an integrated energy management system to monitor, record, analyze, report on and control energy consumption from end sources supplying energy to the Facility that make up 10% or greater of the overall Facility energy consumption. This system to be connected and stored in the BMS.

8.6.3.29 The BMS will accommodate future technological changes and the architecture of the BMS will permit expansion of the system for future renovations. The BMS will have additional 20% capacity floor by floor for traffic increases and future expansion. If panels are not mounted on every floor provide spare conduits to floors served to accommodate the 20% additional capacity utilization without coring.

8.6.3.30 Wiring Materials

(a) Conduit

(i) EMT, Steel fittings, insulated throat connectors.

(b) Conduit – Flexible

(i) Liquid tight or bare as environment requires.

(ii) Liquid tight connectors as required.

(c) Line Voltage

(i) Conduit general: EMT conduit, Steel fittings.

(ii) Conduit flexible; liquid tight, coated flexible, maximum length 500 mm, cast or liquid tight fittings. Application only from junction box and EMT conduit to equipment requiring flexible connection for vibration isolation or service access.

(d) Conductor:

(i) Line voltage power or switched power wiring - No. 12 gauge copper wire minimum.

(ii) Line voltage control wiring - #14 gauge copper wire, length not to exceed 50 meters, #12 gauge copper wire, lengths exceeding 50 meters.

1. NMD90 or RW90.

(iii) Low voltage #18 gauge, shielded, twisted, stranded wire as directed by applicable electrical codes and requirements.

(iv) MSTP Network Cable shall be #24 twisted, shielded, stranded, low capacitance cable.

(e) Device and Wiring Boxes

(i) Heavy gauge aluminum or steel, front access hinged cover, screwed fastening, no gasket unless required by installation environment.

(ii) Comply with BC Electrical Code and all other applicable codes. Rating suitable for installation environment.

(iii) Provide inside separation walls and dividers to separate low voltage wiring from line voltage wiring.

(iv) Size as required.

(v) Provide FS style boxes in Public areas.

(vi) All low voltage wiring shall conform to the following ratings based on construction type as well as whether or not the ceiling space is used as a return air plenum:

(vii) Non-combustible construction, plenum ceiling: FT6 rated wiring.

8.6.3.31 Low Voltage

(a) Flexible conduit with maximum length of 500 mm is allowed only from junction box and EMT conduit to equipment requiring flexible connection for vibration isolation or service access. BX sheathed cable is not approved.

(b) All control wiring not concealed in walls, shall be run in conduit. This includes mechanical and service rooms, and ceiling spaces. Conduit and wiring shall conform to the standards specified in the Electrical specifications.

(c) Conductors not installed in conduit shall be adequately secured with tie wraps or other approved methods, secured to building structure or walls. Wiring shall not be secured to other systems, conduit, piping or ductwork etc. Routing of exposed cable will be parallel with building lines, provided with 90 degree change of direction, tensioned to prevent sagging, and maintain clearance above ceilings by securement to structure or walls.

(d) Conduit and wiring accessories are not to be secured or mounted on equipment, except where terminations are to be completed. Circuitry from unit to unit is to be branched from a conductor run positioned remote from the equipment, allowing adjustment or removal of the equipment without the need to disrupt the conduit. Conduit shall not hinder access to, or opening of, access panels or doors and service positions. Flexible conduit shall be used where devices are mounted on doors or other moving components, including spring isolated elements.

(e) Any exposed conduits or cables shall be run parallel to or at right angles to building lines and in a neat manner.

(f) Wiring between controller and end devices in gas fired appliances equipped with electronic ignition, shall be shielded type cable. Cable to be 18 gauge, 10 conductor minimum, or more as required for additional components. Shield to be grounded at controller end and isolated at equipment end.

(g) Lace or clip groups of [power or control conductors in panels, pull boxes and termination points.

(h) All grounding conductors are to be copper. All ground conductors to have green insulation jacket. Minimum conductor size of 0.82 mm2 (#18 AWG).

(i) Data cabling verification required at both ends shall be completed by the controls agent.

(j) The controls agent is responsible for the continuity of all controls wiring, even if the wiring was installed by others.

(k) Network wiring shall be arranged to maximize network speed:

(l) Connect controllers and devices in a daisy configuration.

(m) Network wiring shall not exceed 4000 m.

(n) Splice network wiring directly at the terminal strip. Do not use pigtails.

(o) Separate network wiring from power wiring.

(p) Use terminators at both ends of each network.

(q) All control and power wiring shall conform to the following ratings based on construction type as well as whether or not the ceiling space is used as a return air plenum:

(i) Non-combustible construction, plenum ceiling: FT6 rated wiring

(r) Voltage rating as required by application. (300/600 volt).

(s) All IMIT Equipment is to be sequenced for installation after terminal cleaning of the building and shall not be installed or stored on site before such cleaning is completed.

8.6.3.32 MS/TP Network

(a) One, balanced, twisted pair. Overall shield.

(b) Low capacitance, 100-120 ohm.

(c) FT6 where installed in plenum.

(d) Manufacturers recommendation, if more stringent.

8.6.3.33 Local Area Network

(a) Cabling to be Category 6A CMR/P, 4 pair, 23AWG.

(b) Jacks to be Category 6A – T568-A.

8.6.4 Maintenance Data and Service

8.6.4.1 Provide for complete service of controls systems, including call backs, for one year running concurrent with guarantee.

8.6.4.2 Verify system operation throughout the one year maintenance period to ensure stable and acceptable operation in all operating conditions.

8.6.4.3 Provide quarterly inspections.

8.6.4.4 Provide annotated trend logs for documentation.

8.6.5 Warranty

8.6.5.1 Provide a written warranty, signed, and issued in the name of the Owner stating that the controls system, materials, devices and software are warranted against faulty material and workmanship for a period of one year from the date of Substantial Performance.

8.6.6 SEQUENCES AND CONTROL DESCRIPTIONS

8.6.6.1 Design Overview

(a) The HVAC system is based on a four pipe fan coil system with heat recovery and a closed geoexchange system. The dedicated heat recovery chiller operates to draw heat from the chilled fluid system and transfer it at a higher temperature to the hot fluid system. The geoexchange system operates to either add or remove heat from the system as required. A boiler plant will provide a back-up heat source in event the DHRC is inoperable.

(b) The Heat Recover Ventilator provides variable outside air and relief as required by the building's CO2 sensors. Fan coil units and terminal heating systems provide temperature control in individual zones. Economizer cooling occurs through direct transfer of geoexchange water to the fan coil units.

(c) Note that the control sequences below are intended as a starting point. Adjust and modify the sequences as directed by the Engineer and as required to meet the design intent. Perform seasonal adjustment during the first year of operation.

8.6.6.2 Graphics

(a) User interface: Full graphics package in colour with system schematics, floor plans, set points, actual values, etc.

(b) Current Sensor Display: Any electric motor required by the points list to display running amps, shall also have on the display, whether graphics or screen text, the rated full load amps of the motor.

(c) All set points, valves and measurements listed in the control sequences must be user adjustable from the graphical user interface.

(d) Provide graphical representations of all thermal plants and terminal systems, including colour floor plans indicating deviation from setpoints.

(e) All points defined in the sequences must be represented in the graphics system.

(f) Refer to the sequences for user adjustable setpoints and provide graphical interfaces.

(g) Provide at a minimum, the following graphic screens:

(i) Landing page showing entire school. Clicking on various locations will change the display to show that floor or area.

(ii) Representations of each groups of areas or rooms for floors. Clicking on various locations will change the display to show that particular room and the associated equipment.

(iii) An overall representation of the water/glycol systems in the buildings. Clicking on various elements will change the display to show details for that particular element or system

(iv) An overall representation of the air systems in the buildings. Clicking on various elements will change the display to show details for that particular element or system.

(v) A screen for each of HEATING or COOLING systems showing in a tabular format, the commanded valve position, resultant valve position, the calculated flow requirement, the resultant flow, and the aggregate flow command and result, the individual and aggregate BTU flows for each terminal device and each major heat source and sink.

(vi) A screen each for overall VFD operation, integration data, HRV performance, and electrical consumption/demand.

(vii) Overall and room level screens showing the current occupancy and lighting operation level from the specified lighting control system. Lighting data is to be as fine grained as the data available from the BACnet interface to the lighting control system.

8.6.6.3 On Site Control – Limited

(a) Access to on site control limited by selective password.

(b) Graphically represented, full colour, mouse selective and click point activated.

(c) Limited ability to change room temperature occupied period set points:

(d) Within limits of plus or minus 2 degrees C.

(e) Classrooms and public spaces: For the operating period only. Set points revert to normal when space next switches to occupied mode.

(f) Offices and administration spaces: Ability to manually select new occupied period set point to remain valid.

(g) Limited ability to change room occupied and unoccupied period start and stop times - one time only:

(i) Within limits of plus or minus 5 hours.

(ii) Start and stop times revert to normal when space next switches to occupied mode.

(h) Limited ability to change multiple rooms or areas occupied and unoccupied period start and stop times - up to seven days in advance:

(i) Within limits of plus or minus 5 hours.

(ii) Start and stop times revert to normal at the end of the next Sunday.

(i) Viewing temperature history of a selected room or area.

(j) Point and click selection of room temperature trend log.

8.6.6.4 Heating Plant

(a) This system operates in a two pipe, variable flow, primary/secondary arrangement to deliver heating fluid to terminal units.

(b) The fluid in this system is 20% propylene glycol.

(c) An operation demand is established by:

(i) OAT dropping below 5C.

(ii) Any fan coil in an occupied space requiring heating.

(iii) The Cooling Plant operating to deliver cooling effect.

(d) On a heating demand, start the lead secondary pump.

(e) Secondary heating pumps operate in a duty/standby configuration.

(f) Change the duty pump during normal occupied hours each Tuesday. Start the standby pump and prove operation prior to stopping the duty pump.

(g) If the duty pump fails to operate on demand, immediately switch operation to the standby pump.

(h) If any pump shows abnormal operation according to current draw, raise a Critical Event alarm.

(i) Setpoint is determined by:

(i) OAT reset schedule.

OAT	-30C	15C
HWST	46C	30C

(ii) Trim and Response based on valve position.

1. Every 15 minutes, survey the position of the most open heating valve.

2. Trim up or down, to a maximum of ± 5C, to maintain the most open valve at 95%.

(iii) Hard limits on the HWST are 46C and 20C.

(j) Maintain setpoint by recovering heat via DHRC. See DHRC sequence.

(k) If HWS setpoint cannot be maintained, supplement by cycling Boilers.

(l) Secondary heating pump rate control.

(i) Minimum pump speed is to be confirmed with the pump manufacturer.

(ii) Operate speed of lead pump to maintain required flow as measured by the ePiv devices. Optimize pump speed with Trim and Response.

1. Every 5 minutes, compare valve flow feedback with demand.

2. If valves are meeting demand, decrease pump speed by 1%.

3. If 10% of valves are not meeting demand, increase pump speed by 1%.

4. If >10% of valves are not meeting demand, increase pump speed by 2%.

(m) Boiler operation

(i) Boilers operate in a rotation configuration.

(ii) Rotate the lead boiler each Tuesday during normal occupied hours.

(iii) On a call for heat, enable the lead boiler.

(iv) The lead boiler will control its respective companion pump.

(v) Command the boiler setpoint to maintain the HWST setpoint. Additional requirements for heat fall to the remaining boilers.

(vi) When the demand for a particular boiler is satisfied, reduce setpoint to minimum, pause 30 seconds and disable the boiler.

(n) Trends

(i) Provide historical trends for the following

(ii) Secondary Heating Pump speed.

(iii) HWST.

(iv) HWRT.

(v) HWS_SP.

(vi) HEATING DIFFERENTIAL PRESSURE.

(vii) HEATING DIFFERENTIAL PRESSURE SETPOINT.

8.6.6.5 Cooling Plant

(a) This system operates in a two pipe, variable flow, primary/secondary arrangement.

(b) The fluid in this system is 20% propylene glycol.

(c) A cooling demand is established by:

(i) OAT rising above 13C.

(ii) Any fan coil in an occupied space requiring cooling.

(iii) The Heating Plant operating to deliver heating effect.

(d) On a cooling demand, start secondary pump.

(e) If pump shows abnormal operation according to current draw, raise a Critical Event.

(f) Setpoint is determined by:

(i) OAT reset schedule.

OAT	34C	20C
CHWST	6.7C	15C

(ii) Trim and Response based on valve position.

1. Every 15 minutes, survey the position of the most open cooling valve.

2. Trim up or down, to a maximum of ± 5C, to maintain the most open valve at 95%.

(iii) Hard limits on the CHWST_SP are 6.7C and 20C.

(g) Secondary pump rate control.

(i) Minimum pump speed is to be confirmed with the pump manufacturer.

(ii) Operate speed of lead pump to maintain required flow as measured by the ePiv devices. Optimize pump speed with Trim and Response.

1. Every 5 minutes, compare valve flow feedback with demand.

2. If valves are meeting demand, decrease pump speed by 1%.

3. If 10% of valves are not meeting demand, increase pump speed by 1%.

4. If >10% of valves are not meeting demand, increase pump speed by 2%

(iii) Modulate 3-way bypass valve to ensure that secondary chilled water temperature does not drop below 5ºC (adjustable). This is intended to prevent cooling coils from freezing when the building load is heating dominant, and a small cooling demand is present.

(h) Trends

(i) Provide historical trends for the following

1. Secondary Pump speed.
2. CHWST.
3. CHWRT.
4. MIXED CHWST.
5. CHWST_SP
6. COOLING DIFFERENTIAL PRESSURE.
7. COOLING DIFFERENTIAL PRESSURE SETPOINT.

8.6.6.6 DHRC Operation

(a) The DHRC shall be staged based on the dominant load demand, which will be determined by a weighted average between the supply water temperature and associated tank temperature sensors. The geoexchange system is intended to false load the non-dominant side.

(b) When the cold tank temperature drops below setpoint, stage chiller to meet a weighted average of the cold tank temperature set point and chilled water supply temperature setpoint.

(c) When the hot tank temperature rises above setpoint, stage chiller to meet a weighted average of the hot tank temperature set point and the heating water supply temperature setpoint.

(d) Reset hot and cold tank temperature set points based on outdoor air temperature and offset based on minimum deviation of control valve flow setpoint from maximum design flow setpoint. This approach is intended to relax tank temperature set points as much as possible by maximizing flow to the terminal equipment, but without underserving the most demanding zone. However, an override function shall be provided to allow the user to manually remove trouble zones from the calculation.

(e) In heating mode, limit compressors to avoid geoexchange field saturation.

(f) DHRC operates to provide heating and cooling as required.

(g) DHRC operates with heating or cooling secondary pump.

(h) On a demand for DHRC, start the lead Hot and Cold primary pumps.

(i) If any pump shows abnormal operation according to current draw, raise a Critical Event.

(j) Upon proof of pump operation, cycle the required number of compressor stages.

(k) Provide a time delay to prevent rapid cycling of stages.

(l) Rotate the lead module each Wednesday during normal occupied hours.

(m) Additional requirements for heating/cooling fall to the remaining modules. When the demand for effect is satisfied, stop compressor stages. Allow companion circulator to operate for an additional 30 seconds.

(i) Pump rate control

1. Minimum pump speed is to be confirmed with the pump manufacturer.

2. Operate speed of lead pump to maintain required pressure across DHRC.

3. On demand of an additional module, increase pump speed to compensate for isolation valve opening.

4. As demand for a module is lost, stop compressor. Allow pump to slow down to compensate for module isolation valve closing.

5. After final demand is lost, allow pumps to operate for an additional 30 seconds.

6. Minimum run time of compressor is 5 minutes.

8.6.6.7 Geoexchange Loop Pump Control

(a) When the plant is predominantly in either heating or cooling mode, the geoexchange system is intended false load the side (either cooling or heating) that is not dominant.

(b) If the hot tank temperature rises above setpoint, open the associated valve and modulate the geoexchange pump speed to meet the hot tank temperature.

(c) If the cold tank temperature drops below setpoint, open the associated valve and modulate the geoexchange pump speed to meet the cold tank temperature.

(d) During prolonged periods of inactivity, close the hot tank valve, close the cold tank valve, and open the bypass valve. Circulate the pumps until temperature stabilizes and record the stabilized temperature in the trend logs.

8.6.6.8 Heating Coil Circuit Pump Control

(a) Automatically started if outdoor air temperature drops below 10 degrees C.

(b) Automatically started if heating coil valve moves to 95 percent open. Shuts down when heating coil valve returns to below 10 percent open.

(c) Automatically started on demand of freeze protection system.

8.6.6.9 Chilled Water Tank Economizing

(a) If geoexchange water is suitable to maintain chilled tank temperature and no heating effect is required:

(b) Shut down chiller.

(c) Open chilled water tank geoexchange valve.

(i) Modulate geoexchange pump speed to maintain chilled tank temperature.

8.6.6.10 Glycol Tank/Pressure Management

(a) Monitor the low-level float in the tank. If the float falls, raise a Critical Alarm.

(b) Monitor the current of the pump. If the pump runs for more than 10 minutes, raise a Critical Alarm

8.6.6.11 Coil Freeze Protection

(a) Provide coil freeze protection by damper override, circulation pump override or other approved means.

(b) Freeze Protection – Recirculating Air Handler:

(i) Occupied Mode. If outdoor air damper position is in the minimum position, as controlled by outdoor air sequence or economizer sequence, but mixed air temperatures entering the coils are at levels where freezing damage is imminent, override the outdoor air set point to modulate the outdoor air dampers to reduce the quantity of incoming cold air in order to maintain mixed air temperatures above the freeze protection set point. A full shutdown is not required unless the dampers have modulated fully closed and the freezing condition is still imminent.

(ii) Unoccupied Mode: The mixed air plenum temperature shall be monitored during shutdown and controlled to a set point of 5 degrees Celsius. If the temperature drops below set point, the valve and pump for the heating coil in the unit are to operate to maintain the set point. The fan system is to remain in shutdown mode unless activated by other requirements or controls. Provide an alarm to the operator.

(c) Freeze Protection – Non recirculating Air Handler:

(i) Occupied Mode: The coil leaving fluid temperature shall be monitored. If temperatures drop below a set point of 5 degrees Celsius, the dampers shall close and the fan systems shall shut down. If monitored temperatures drops below set point, the valve and pump for the heating coil are to operate to maintain the set point. The fan system is to remain in shutdown unless activated by other requirements or controls. Provide an alarm to the operator.

(ii) Unoccupied Mode: The coil leaving fluid temperature shall be monitored during shutdown and controlled to a set point of 5 degrees Celsius. If monitored temperatures drops below set point, the valve and pump for the heating coil are to operate to maintain the set point. The fan system is to remain in shutdown unless activated by other requirements or controls. Provide an alarm to the operator.

(d) On system start up, coil mixing valve is to be positioned to full heat for a time no less than three minutes. This full heat position is required to overcome the surge of cold air that could cause inadvertent freeze protection sequence activation.

8.6.6.12 Intrusion Interconnect

(a) Provide Digital inputs for Intrusion alarm (2), Armed/disarmed, InAlarm/Normal

(b) Monitor ARMED/DISARMED status of intrusion system.

(c) On transition to ARMED, all overrides shall be canceled and schedules to NIGHT mode in the appropriate zones.

(d) On activation of intrusion system to InAlarm, signal output to lighting control system for AllLightsOn.

(e) Provide digital input for Fire Alarm system, InAlarm.

(f) On InAlarm transitioning from InAlarm to Normal, restart mechanical equipment interlocked via the FA panel in an orderly, controlled manner.

8.6.6.13 Lighting Control System

(a) Provide BACnet Object Identifiers from Lighting Control System manufacturer that correspond to the BMS and Lighting Control Integration Schedule below. Building Automation System to provide seamless integration to the Lighting Control System points listed in the schedule. Present On/Off status in graphical format. Format to be approved by owner before completion.

LIGHTING CONTROL INTEGRATION SCHEDULE	
BMS SYSTEM BACNET OBJECT	**LIGHTING SYSTEM CONTROL BACNET OBJECT**
PARKING LOT POLES	
PEDESTRIAN POLE LUMINAIRES	
EXTERIOR WALL PACKS	
EXTERIOR STEP LIGHTS	
MULTIPURPOSE ROOM	
STUDIO (EACH STUDIO TO HAVE SEPARATE OBJECT)	
PROJECT MAKER SPACE (EACH STUDIO TO HAVE SEPARATE OBJECT)	
GYMNASIUM	
LINK SPACES (EACH LINK TO HAVE SEPARATE OBJECT)	
OFFICE (EACH OFFICE TO HAVE SEPARATE OBJECT)	
OTHER PROGRAM SPACES	
DRAMA ROOM	
MUSIC ROOM	
EXTERIOR SIGNAGE	
EV CHARGING STATIONS	

(b) Provide digital output for connection to lighting control system. AllLightsOn.

8.6.6.14 Electrical Metering

(a) Provide modbus or other connections to electrical metering. Record consumption and demand in 5 minute intervals and store.

(b) Sequence mechanical equipment start up to limit the electrical demand.

8.6.6.15 ERV

(a) General

(i) ERV serves as a Dedicated Outdoor Air System (DOAS).

(ii) ERV is a high-mass total energy recovery unit with additional heating.

(iii) Supply fan and return fan operate independently.

(iv) Initial building pressure setpoint is 2 Pa positive.

(b) DAY Mode

(i) Enable ERV. Internal controls operate to open dampers and enable VFD's.

(ii) Operate supply fan to maintain duct pressure as sensed at the bottom of the OA risers on the Main floor. Determine setpoint in cooperation with the balancing contractor.

(iii) Operate return fan to maintain the building pressure at setpoint.

(iv) Internal 'barn-door' dampers transition at a 70 second interval, controlled by internal controls.

(v) Minimum Outdoor Air Supply Mode (DAY mode only): Modulate the relief fan to maintain set point flow at all constant volume control stations and minimum set points at variable volume control stations (10%). Override associated fan coil outdoor air damper control and provide enough outdoor air to maintain positive building pressure.

(vi) Secondary outdoor air intake with modulating dampers and airflow measurement to be provided. Bypass dampers to open as required to offset building pressure imbalance when Indigenous or Home Ec as identified in the Appendix 1B – Room Data Sheets, dedicated exhaust fans are operating. Relief fans to ramp down in this mode to prevent imbalance between non bypassed outdoor air and relief air flows.

(c) NIGHT Mode

(i) ERV is inoperative.

(ii) Shutoff dampers are closed.

(iii) On normal fan shutdown, dampers are to be held open long enough to allow the fan wheels to stop rotating. On normal start up, dampers are to be fully open before fans start.

(d) Trends

(i) Provide historical trends for the following:

1. ERV_OA_EAT
2. ERV_OA_LAT
3. ERV_EA_EAT
4. ERV_EA_LAT
5. SUPPLY FAN SPEED
6. RETURN FAN SPEED
7. ERV_BUILDING_DPS.

8.6.6.16 Air Flow Metering Stations

(a) Constant volume control stations: Modulate opposed blade dampers in order to maintain air flow set point.

(b) Variable volume control stations: Modulate opposed blade dampers to restrict air flow as required to maintain building pressure setpoints. Do not permit variable volume control station air flows from dropping below their minimum setpoints. The Heat Recovery Ventilator shall switch to Minimum Outdoor Air Supply Mode to prevent this from occurring.

8.6.6.17 Fume Hood Exhaust Control

(a) When current sensor detects that Kiln is operating, open the damper and start the fan.

8.6.6.18 Staff Room 1.14 and Resource 8.10 Kitchen Exhaust Control

(a) Activation of the local switch on range hood “RH” starts the remote fan and opens the damper.

(b) When local switch is deactivated close the exhaust volume control damper after a pre-set time delay.

8.6.6.19 Home Ec Kitchen Exhaust Control

(a) Activation of the local switch starts the fan and opens the damper.

(b) When local switch is deactivated close the exhaust volume control damper after a pre-set time delay.

8.6.6.20 Temperature Set Point Relaxation (OCCUPIED/UNOCCUPIED mode)

(a) During DAY mode, relax the heating and cooling temperature set points when the lighting control system registers a zone as being UNOCCUPIED. Reset the temperature relax offset such that the offset decreases as the outdoor air temperature drops below 0 degrees C or rises above 25 degrees C. Temperature relaxation offset rates and temperatures must be fully user adjustable.

(b) Adjust the temperature relaxation offset rates and temperatures such that changes in occupancy do not change hot water temperature reset enough to require boiler operation where it would not otherwise be required.

8.6.6.21 Air Handler – Gymnasium (Part A) 4.01, Gymnasium (Part B) 4.02

(a) General operating sequences are as follows:

(i) During DAY periods, supply and return fans will run continuously. Supply and return fans will modulate with a fixed speed offset, not a fixed percentage offset. Heating or cooling will be provided as demanded by space temperature sensor.

(ii) System will switch from DAY TO NIGHT mode based on a schedule. The gym lighting occupancy sensor will override the gym into OCCUPIED mode when occupancy is detected.

(iii) Outdoor air dampers will modulate from 100% open to minimum position, controlled by a carbon dioxide concentration sensor in the return air duct.

(b) DAY mode:

(i) Fans will run continuously at minimum airflow.

(ii) On a call for heating or cooling, modulate the supply air reset temperature to maintain the zone temperature set point.

(iii) Modulate the heating or cooling control valve to meet the supply air reset temperature.

(iv) If the heating or cooling control valve is fully open and the room demand is not met, increase the supply air volume to maintain the zone temperature set point.

(v) If CO2 concentration rises above set point, modulate the outdoor air dampers to maintain CO2 concentration below the set point.

(vi) If the outdoor air dampers are at maximum open position and the CO2 concentration exceeds set point, increase supply air volume to maintain CO2 concentration below the set point.

(c) NIGHT mode:

(i) Fans will remain off unless there is a call for heating.

(ii) On a call for heating, start the supply fan at minimum air flow and modulate the supply air reset temperature to maintain the zone temperature set point.

(iii) Modulate the heating control valve to meet the supply air reset temperature.

(iv) If the heating control valve is fully open and the room demand is not met, increase the supply air volume to maintain the zone temperature set point.

(v) Once the zone temperature set point is met, shut down the fans.

(d) Provide a dead band between heating and cooling and provide programming to prevent simultaneous heating and cooling.

(e) Activate OCCUPIED mode based on input from lighting control motion sensors.

8.6.6.22 Air Handler –Mechanics Shop 17.01, Wood Construction shop 19.01 and Metal Shop 20.01

(a) General operating sequences are as follows:

(i) During DAY periods, supply and return fans will run continuously. Supply and return fans will modulate with a fixed speed offset, not a fixed percentage offset. Heating or cooling will be provided as demanded by space temperature sensor.

(ii) System will switch from DAY TO NIGHT mode based on a schedule. The gym lighting occupancy sensor will override the gym into OCCUPIED mode when occupancy is detected.

(iii) Outdoor air dampers will open 100% to provide make-up for general exhaust ventilation.

(b) DAY mode:

(i) Fans will run continuously at minimum airflow.

(ii) On a call for heating or cooling, modulate the supply air reset temperature to maintain the zone temperature set point.

(iii) Modulate the heating or cooling control valve to meet the supply air reset temperature.

(iv) If the heating or cooling control valve is fully open and the room demand is not met, increase the supply air volume to maintain the zone temperature set point.

(v) If the outdoor air dampers are at maximum open position and the CO2 concentration exceeds set point, increase supply air volume to maintain CO2 concentration below the set point.

(c) NIGHT mode:

(i) Fans will remain off unless there is a call for heating.

(ii) On a call for heating, start the supply fan at minimum air flow and modulate the supply air reset temperature to maintain the zone temperature set point.

(iii) Modulate the heating control valve to meet the supply air reset temperature.

(iv) If the heating control valve is fully open and the room demand is not met, increase the supply air volume to maintain the zone temperature set point.

(v) Once the zone temperature set point is met, shut down the fans.

(d) Provide a dead band between heating and cooling and provide programming to prevent simultaneous heating and cooling.

(e) Activate OCCUPIED mode based on input from lighting control motion sensors.

8.6.6.23 Low Temperature Hydronic Fan Assisted Terminal Heaters

(a) If OAT < 10C, allow force flow heaters to operate. Disable above OAT > 12C.

(b) On demand, enable fan and operate at 100% balanced speed. Modulate heating valve to maintain setpoint.

(c) Setpoint to be 18C.

8.6.6.24 Hydronic Fan Assisted Terminal Heaters and Air Conditioners

(a) On demand, enable fan and operate at 100% balanced speed. Modulate valve to maintain setpoint as measured by room temperature sensor.

(b) Setpoint to be 23C.

8.6.6.25 Domestic Water Pump Controls

(a) Provide relays on domestic water pump connections or on magnetic starter.

(b) When enabled by a schedule, start and stop the domestic hot water recirculation pump as required to maintain temperature in the domestic hot water recirculation piping system.

8.6.6.26 In-Floor Heating Systems

(a) Occupied Mode: Pumps shall circulate continuously on call for heat. The control valve shall modulate to maintain the heating water setpoint in each radiant zone. Room temperature sensor shall modulate EPIV valve to maintain room setpoint.

(b) Un-occupied Mode: Pumps shall be disabled. Room temperature sensor shall start zone pump and modulate EPIV valve to maintain un-occupied setpoint.

8.6.6.27 Fan Coil and Air Handler Control (Except serving Gymnasium (Part A) 4.01, Gymnasium (Part B) 4.02, Mechanics Shop 17.01, Wood Construction shop 19.01 and Metal Shop 20.01) – Variable Air Volume

(a) GENERAL

(i) Fan coils serving individual occupied spaces. Outdoor air from ERV.

(ii) Separate heating and cooling coil with separate ePiv valves on return lines.

(iii) On a demand for heat, operate ePiv as required for effect.

(iv) On a demand for cooling, operate ePiv as required for effect.

(v) Units operate in NIGHT mode or Day mode.

(vi) Room setpoints.

1. NIGHT-SP – 20C.
2. DAY-Heating SP – 21C.
3. DAY-Cooling SP – 23C.
4. NIGHT-Cooling SP – No Cooling.

(b) NIGHT Mode

(i) Fan is off.

(ii) Cooling is disabled.

(iii) If the room temperature falls below NIGHT-HSP, operate fan. Allow to run for 10M. If still below setpoint, operate heating valve at full flow until RT > NIGHT-HSP +0.2. close valve. Operate fan an additional 5M.

(iv) Position OA damper to 0%.

(c) DAY mode.

(i) Fans will run continuously at minimum airflow.

(ii) Heating and cooling operate to DAY-HSP and DAY-CSP setpoint in the space. On a call for heating or cooling, modulate the supply air reset temperature to maintain the zone temperature set point.

(iii) Operate OA damper to maintain room CO2 below ambient CO2 + 700ppm.

(iv) If an operable wall is open, control combined zones to meet the room temperature setpoint of the most demanding temperature sensor with a weighted average.

(d) Provide a dead band between heating and cooling and provide programming to prevent simultaneous heating and cooling.

8.6.6.28 Split System HVAC Control

(a) Fans will run continuously. Cooling will be provided as demanded by individual zones, by manipulation of coil control valves on each unit.

(b) Install factory control accessories.

(c) Install control panels for cooling units in ceiling space above serviced room. Provide access for service. Set cooling set points at 21 degrees C.

8.6.6.29 Room Temperature Sensors - 4 Button

(a) One button programmed for occupied mode selection to provide occupied mode set points and fan operation in activated zone only. Outdoor air units do not start in this activation. Duration of occupied mode to be selectable through software, but generally to be two hours.

(b) One button programmed for unoccupied mode selection to provide unoccupied mode set points and fan operation in deactivated zone only.

(c) One button programmed for temperature set point up during occupied mode. Upon activation, temperature set point is to be raised only once, a preselected value. After a preselected time has passed, the button can be operated again to again reset the temperature set point up a preselected value. The temperature reset function can happen only twice. The set points revert to original settings when the next occupied mode commences. The duration of time between activations and the limit of temperature resets upwards is to be selectable through software, but generally to be twenty minutes and 1 degree Celsius each activation.

(d) One button programmed for temperature set point down during occupied mode. Upon activation, temperature set point is to be depressed only once, a preselected value. After a preselected time has passed, the button can be operated again to again reset the temperature set point down a preselected value. The temperature reset function can happen only twice. The set points revert to original settings when the next occupied mode commences. The duration of time between activations and the limit of temperature resets upwards is to be selectable through software, but generally to be twenty minutes and 1 degree Celsius each activation.

(e) Provide programming to prevent uncontrolled operation in instances where the operation pushbutton is jammed and the input to the controller is continuous.

8.6.6.30 Alarms

(a) Provide alarms when operation of a monitored point does not match the commanded value.

(b) Provide alarm when normal operation parameters (amps, load, HWST and CHWST) are not in normal range or match setpoint after a user-adjustable delay.

(c) Provide alarm when monitored equipment is in FAULT.

8.6.6.31 Startup After Power Failure

(a) The mechanical should be activated in sequence so as not to excessively load the breakers.

8.6.6.32 Valve Table

(a) Provide Valve Table accessible through graphics for all terminal equipment with EPIVs. The valve property lookup table shall continuously monitor the inputs from all devices and update the table in real time. The heating and cooling capacities shall be calculated based on the sum of inputs to provide an instantaneous building demand. An abbreviated example of the table is included below.

VALVE TABLE					
TYPICAL CONTROL VALVE	**COMBINATION COOLING AND HEATING CONTROL VALVE**	**COOLING CONTROL VALVE**	**HEATING CONTROL VALVE**	**...**	**TOTAL**
	C/H-CV-X.X	**C-CV-X.X**	**H-CV-X.X**	...	-
% OPEN				...	-
COOLING FLUID FLOW (L/S)				...	"SUM OF ALL"
HEATING FLUID FLOW (L/S)				...	"SUM OF ALL"
COOLING CAPACITY (KW)				...	"SUM OF ALL"
HEATING CAPACITY (KW)				...	"SUM OF ALL"

8.6.6.33 Existing Gymnasium Integration

(a) Provide hardwired integration for existing remote Gym BMS. All existing points and sequences of the remote Gym to remain. All management of these existing points to be through the new school BMS.

8.6.6.34 NLC Childcare Space Integration

(a) Provide hardwired integration of NLC childcare space to the central BMS.

8.7 Division 26 - Electrical

8.7.1 General

8.7.1.1 Basic Requirements

(a) The Design-Builder will supply and install all material necessary to complete and make operational the electrical systems.

(b) Appendix 1D - Systems Responsibility Matrix provides a summary of the party's responsibilities related to design and construction of the building systems.

(c) Electrical/security locking requirements to be confirmed with the Owner during design development.

(d) Refer to Appendix 1A - Submittals for submittal requirements.

(e) The Design-Builder will comply with all requirements in this Section as well as all the electrical requirements in other sections and associated appendices.

(f) All electrical systems, materials, and equipment in the Facility will be new, and of a type and quality intended for use in a permanent educational facility. Remanufactured or refurbished equipment will not be permitted. All equipment and their components will have a visible manufacturer's nameplate, indicating the manufacturer's name, model number, serial number, cUL listing, capacity, electrical characteristics and approval stamps. The electrical systems will provide proper protection, continuity of service and a safe working environment for Staff and students.

(g) The Design-Builder will be responsible for all coordination of all electrical or systems interfaces with all divisions involved.

(h) The Design-Builder will identify on electrical drawings for all locations of all fire-rated partitions and smoke separations.

(i) The Design-Builder will comply with the latest editions and revisions of all applicable Standards including those standards listed in Section 2.1 (Standards) and the following:

(i) Not in use

(ii) Canadian Electrical Code and BC Electrical Safety Branch Regulations and Bulletins;

(iii) British Columbia Fire Code including the requirements of the Authority Having Jurisdiction;

(iv) National Energy Code of Canada for Buildings;

(v) National Fire Protection Association (NFPA) Standards;

(vi) CAN/ULC S524 Standard for the Installation of Fire Alarm Systems;

(vii) CAN/ULC S537 Standard for the Verification of Fire Alarm Systems;

(viii) Not in use

(ix) All Electrical Safety Branch Directives and Bulletins; and

(x) BCBC.

8.7.1.2 Performance Requirements

(a) The Design-Builder will:

(i) install every electrical system in a fixed and permanent manner;

(ii) provide sufficient space in service rooms for future equipment additions;

(iii) locate Electrical and Telecommunications Rooms to provide easy access for maintenance and inspections of equipment; and

(iv) provide record drawings and operation and maintenance manuals in accordance with this Agreement, Project Binder and Record Drawings.

(b) The Design-Builder will select the appropriate firestop assembly to suit that type of penetration and will comply with the selection criteria specified herein.

(i) Follow all manufacturer's documentation, including the approved shop drawings, for proper installation of each firestop product and system. All firestop assemblies will be installed in accordance with the manufacturer's written instructions to maintain the specific rating assigned by the applicable independent testing laboratory.

(ii) In all finished areas make good the surface area surrounding firestop penetrations to match finished quality of adjoining surfaces.

(iii) Provide damming materials, plates, wires, restricting collars, and any other devices necessary for proper installation of the firestop product or system.

(iv) Remove all combustible installation aids after firestopping material has cured.

(v) Remove excess materials and debris and clean adjacent surfaces immediately after application of firestop products.

(c) The following products are approved for use only in the specific applications for which they are rated and tested. Additional products will be considered for approval if they are produced by an acceptable manufacturer.

(i) Sealants

1. Hilti FS-ONE Intumescent Firestop Sealant.

2. STI LCI Intumescent Sealant.

(ii) Plugs

1. Hilti CP 658 Firestop Plug.

2. STI SpecSeal Series FP Intumescent Firestop Plugs.

(iii) Fire Blocks

1. Hilti FS 657 Fire Block.

(iv) Pillows

1. STI Series SSB Firestop Pillows.

(v) Putty

1. Hilti CP 617 Firestop Putty Pad.

2. Hilti CP 618 Firestop Putty Stick.

3. STI SpecSeal SSP Intumescent Putty.

(vi) Fire Rated Pathways (to be used for Cable Tray penetrations)

1. Wiremold FlameStopper Thru-Wall Fittings.

2. Specified Technologies EZ-Path.

8.7.2 Load Classification and Identification

8.7.2.1 Performance Requirements

(a) The Design-Builder will provide a detailed load calculation.

(b) The Design-Builder will provide identification as follows:

(i) All main distribution switches, breakers, panels, transformers, generators, control devices, disconnect switches and other major electrical equipment with Lamicoid plates. State circuit number or where it is fed from - “Fed From Panel X”. Use black lettering on white face for normal power and white lettering on red face for emergency panels and circuits. All nameplates will be mechanically attached (rivets or sheet metal screws). Adhesive affixing alone is not sufficient. Lettering on name tags will be sized as follows:

Equipment	**Height of Letters**
Main Distribution Panel (MDP)	12.7mm (.5”)
Overcurrent Protection Devices in MDP	6.4mm (.25”)
Branch Circuit Panelboards	6.4mm (.25”)
Disconnect Switches (200A or less)	6.4mm (.25”)
Disconnect Switches (Greater than 200A)	12.7mm (.5”)
Motor Starters	6.4mm (.25”)

(ii) In terminal cabinets for control wiring, sound wiring, telephone and/or data cable, fire alarm wiring, and similar systems, identify terminal strips and other similar equipment with
4.8mm (3/16”) roll adhesive back embossed type name tags
(clear adhesive with black lettering). Include a wiring diagram
in the cover for each terminal cabinet.

(iii) Typewritten panel directories for each circuit, referencing the room in which the equipment served is located. Include the room number and room description in the reference (e.g. “PE – Gym 100 North Wall”). Similar method will be utilized for Data and security equipment and outlets.

(iv) Disconnect Switches, Starters and Contactors: Indicate equipment being controlled, location by room number, voltage, and phase (e.g., “EF-10, WC A120, 120V, 1gi”).

(v) Terminal Cabinets: Indicate system and voltage.

(vi) Remote On/Off Switches: Indicate area(s) being served by room number.

(c) The Design-Builder will use the room numbers that will be used by the Occupants, not the room numbers used in the construction documents. Confirm actual room numbers with the Owner and Coordinating Consultant prior to creating labels.

8.7.3 Electrical and Utility Services

8.7.3.1 Basic Requirements

(a) The Design-Builder will coordinate all power, telecommunication, and CATV utility services with BC Hydro, Telus and Shaw. The Design-Builder will conduct the construction in accordance with the relevant utility standards and requirements, including the BC Hydro utility standards.

(b) The Design-Builder will provide type DB2 utility service entrance ducts, or as required by the local utility. Provide drainage of ducts in accordance with utility standards.

(c) The Design-Builder will provide the following underground service components as per the following requirements:

(i) Primary ducts and secondary ducts, whether concrete encased or directly buried, will be rigid type DB2 polyvinyl chloride conduit complying to the latest edition of CSA C22.2 No 211.1.

(ii) Install underground utility service boxes as directed by Utility “For Construction” drawings.

(iii) All other underground junction boxes will be manufactured by West Coast Engineering, Konkast or Armtec.

(iv) Provide drainage rock pit below all junction boxes.

(v) Bell ends, couplings, adapters, bends and other fittings will be of the same material as the duct. Solvent recommended by manufacturer will be used.

(vi) Only factory bends are acceptable.

(vii) Plastic Warning Tape Trace: 150mm (6”) wide yellow polyvinyl tape.

(d) The Design-Builder will provide and install ductbanks as per the following:

(i) Contact and coordinate with each utility prior to installation of any underground services to ensure full coordination with the utility’s “For Construction” drawings and all civil Site and offSite servicing drawings.

(ii) Install on undisturbed soil where possible. Provide sand cover and backfill as indicated in conduit section in drawings or as directed by the respective Utility.

(iii) Clean ducts with full size mandrel and swab all ducts. Install 7mm (¼”) nylon pull cord in all ducts.

(iv) All service ducts to be installed not less than 1m (3’), and not more than 1.8m (6’), below finished grade.

(v) Rigid threaded galvanized steel conduit will extend not less than 3m (10’) from building.

(vi) Halfway between ductbank and finished grade, supply and install 150mm (6”) wide polyvinyl warning tape for entire length of each ductbank on Site.

(vii) Clean ductbanks before installation. Cap ends of ducts during construction and after installation to prevent entrance of foreign materials.

(e) The Design-Builder will install primary & secondary services ducts to comply with all regulations and by-laws of the supply and inspection authorities. General routing to be coordinated with new and existing underground services.

(f) The Design-Builder will provide the telephone service including the following requirements:

(i) Install underground telephone services as required by Telus. General routing to be coordinated with new and existing underground services.

(ii) Install 100mm (4”) rigid PVC duct from the main telephone terminal board (MTTB) to the service point.

(iii) Provide nylon pull cord in each and every telephone service duct.

(iv) Telephone service cables to be supplied and installed by Telus.

(v) The Design-Builder to arrange and coordinate telephone service requirements with the Owner and telephone supply authority. Coordinate and schedule all work and inspections to be completed by Telus.

(g) The Design-Builder will provide the television service including the following requirements:

(i) Install new underground cable television service as detailed on the drawings and as required by Shaw Cablesystems. General routing to be coordinated with new and existing underground services.

(ii) Install one 75mm (3”) rigid PVC duct from the main television terminal board (MTVTB) to the service point as directed by Shaw Cablesystems.

(h) Primary service ductbank to slope to low point adjacent to building for drainage purposes.

(i) The Design-Builder will provide:

(i) T fittings and drain pipe to rock pit for each service duct; and

(ii) Drainage rock pit for each T-Drain.

(j) The Design-Builder will provide seismic restraint systems and methods that comply with the following:

(i) Facilitates ease of maintenance and ease of replacement and reconfiguration of electrical equipment and systems and other equipment and the Facility components.

(ii) Coordinates with the building architecture and finishes. Components of seismic restraints will, wherever practicable, be concealed from public view. Where concealment is not practicable the systems will be designed to complement the building architecture and finishes.

(iii) Meets or exceeds the requirements of the current edition of the BCBC and National Building Code.

(k) The Design-Builder will provide:

(i) One underground electrical services for the main electrical rooms within the Facility. The switchgear for these incoming services will be rated for 600V.

(ii) Sufficient capacity of the utility connections, cable and incoming high voltage switchgear for the CEC 8-204 calculated load requirements plus 25% spare capacity.

(iii) Separate underground service ducts as required by Telus and Shaw to the services Entrance Facility in the Main Telecommunications Room (LAN) as the main demarcation for the Facility. The Entrance Facility in the Main Telecommunications Room (LAN) may be shared with the main electrical room.

(iv) Concrete encasement, location marking, and other means to guard against accidental disruption of utility connections by on-Site or near-Site activities. The installation will be in accordance with the individual utility company standards and requirements.

8.7.4 Seismic Requirements for Electrical Systems

8.7.4.1 Basic Requirements

(a) The Design-Builder will obtain and pay for the services of a Professional Engineer specializing in seismic restraints, to design supports and seismic restraints for electrical equipment and components of electrical systems including telecommunication racks and low voltage systems and to provide BCBC Schedules SB and SC. The Design-Builder will provide copies of seismic restraint drawings, shop drawings.

(b) The Design-Builder will submit shop drawings including details of all connections, bracing, and restraints for equipment requiring seismic restraint and/or vibration isolation. Shop drawings submitted will bear the seal of the Professional Engineer retained in accordance with Section 8.5.4.1(a).

(c) Where drilling of the structure is required for anchorage details, the drilling will be subject to the approval of the Structural Engineer of Record for the project.

8.7.4.2 Performance Requirements

(a) The seismic restraint systems and structural capacity, or, where an identified pre-designed standard restraint device or system exists for a particular item, will be designed by a Professional Engineer.

(b) All electrical equipment which vibrates or makes noise will be suitably isolated from noise- sensitive areas such as classrooms, offices, and theatres. Any audible sound from transformers, contactors, starters or the like in such areas is not acceptable and will be remedied by the Design-Builder at no cost to the Owner.

8.7.5 Grounding and Bonding

8.7.5.1 Basic Requirements

(a) The Design-Builder will properly bond and ground all electrical equipment and systems in the Facility in accordance with the most current edition of the Canadian Electrical Code, ANSI/TIA Standards, and local codes and by-laws.

(b) The Design-Builder will provide grounding and bonding 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.

8.7.5.2 Performance Requirements

(a) The Design-Builder will ensure all conductors and conducting components which form part of the grounding and bonding systems in the Facility will be of non-alloyed copper.

(b) The Design-Builder will provide grounding grid consisting of minimum three 20mm (3/4") x 3m (10’) copper clad steel driven rods (or the amount necessary to obtain acceptable levels) with #3/0 bare stranded copper interconnecting cable. Install two cables from the grid to the main ground bus in the electrical room.

(c) The Design-Builder will provide a ground bus adjacent to the main distribution panel install a continuous main ground bus, of hard drawn copper, flat, 50 mm (2”) wide x 6 mm (1/4”) thick, length as required. Mount on insulating standoffs. Install complete with lugs suitable for grounding cables.

(d) The Design-Builder will provide cable connections to ground rods will be made with approved exothermic welds or Thomas & Betts ground system compression connectors. Also provide #3/0 bare copper ground conductor between all wall mounted ground busses on the same power distribution system

(e) The Design-Builder will provide the following:

(i) One #4/0 bare ground conductor in 25mm (1") conduit from ground bus to service ground lug on main distribution panel.

(ii) One #4/0 insulated ground conductor in 25mm (1") conduit from main electrical room ground bus to water main with approved ground clamp ahead of water meter. Install one #3/0 ground conductor jumper of flexible copper strapped around water meter and associated unions and valves to ground building side of water system.

(iii) Grounding bushings, grounding studs and grounding jumpers at all distribution centres, pullboxes, meter centres, and panelboards where separate grounding conductors are indicated.

(iv) Bonding conductors to lugs on boxes, tubs and other conductive enclosures. Use conductors with green insulation, sized by CEC Table 16. Connection to neutral to be made only at service neutral bar with a dedicated lug.

(v) Bonding wire in all flexible conduits. Connect wire at each end to a grounding bushing, solderless lug, clamp, cup washer and screw.

(vi) All interior metallic gas piping to be made electrically continuous and to be bonded in accordance with the requirements of the current edition of the Canadian Electrical Code.

(vii) Each metallic waste water piping system in the Building will be grounded by bond to the interior metallic water supply system with copper bonding jumper of not less than #6 AWG or as per the current edition of the Canadian Electrical Code.

(viii) Ground applicable communication systems as follows:

1. Telephone & Data:

2. One #6 TWH in 20mm (3/4") conduit from main ground bus to main telecommunications ground bus.

3. One #12 TWH from telecommunications ground bus to all metal conduits terminating at backboard.

(ix) Fire Alarm:

1. One #8 TWH in 16mm (1/2") conduit to main ground bus.

(x) Television Distribution System:

1. One #6 TWH in 20mm (3/4") conduit from main ground bus to main telecommunications bus.

(xi) Security Systems:

1. One #8 TWH in 16mm (1/2") conduit to main ground bus.

(xii) Sound & PA Systems:

1. One #8 TWH in 16mm (1/2") conduit to main ground bus.

8.7.5.3 Each feeder and branch circuit will have a separate green insulated equipment bonding conductor.

(a) Main electrical room and all Telecommunications Rooms will be provided with a copper ground bus bar.

(b) A 4/0 AWG grounding conductor in conduit will be extended from the main building ground for each building to the main electrical room and from there to each additional sub-distribution room.

(c) A 4/0 AWG grounding conductor in conduit will be extended from the main Building ground to the Main Telecommunications Room (School LAN) and from there to each Telecommunications Room and the Main Telecommunications Room.

(d) All panelboards will be fitted with a branch circuit grounding terminal bus firmly bonded to the inside of the panelboard case and consisting of a length of copper grounding bus with one terminal for each circuit position available in the panel. Branch circuit equipment grounding conductors will terminate at the ground bus.

(e) The Design-Builder will commission an approved testing agency to perform a main system ground test and provide a report confirmation to the Owner.

8.7.6 Not In Use

8.7.7 Power Quality

8.7.7.1 Basic Requirements

(a) The Design-Builder will provide an overall power quality which assures suitable conditions for operation of all electrical and electronic equipment throughout the Facility.

(b) The Design-Builder will provide equipment and systems, which meet applicable codes and standards to prevent electrical equipment and systems from being harmed or impaired either by external events or conditions, such as lightning and disturbances on the utility service, or by Facility generated internal events or conditions.

8.7.7.2 Performance Requirements

(a) The Design-Builder will provide equipment specifically designed to meet applicable codes and standards to minimize all 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 to be addressed include, but are not limited to voltage spikes, dips and droops, transients, harmonics, power factor and radio frequency interference."

(b) The Design-Builder will 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 for all conditions of operation (occupied/ unoccupied/ summer/ winter).

8.7.8 Emergency Power

8.7.8.1 The Design-Builder will provide a stand-by rated natural gas generator for the Facility for backup power for (lighting, fire alarm, heating, security, access control), and if required for sump pumps. The generator will be sited in a discrete and unobtrusive location, with easy access for refilling to be confirmed in consultation with the Owner.

8.7.8.2 The system shall comply with the latest edition of CSA 282.

8.7.8.3 The system shall provide back up power to the following.

(a) Emergency lighting

(b) Complete HVAC heating system (not including heat pumps/geothermal system)

(i) Boilers

(ii) Fan coils

(iii) Circulation pumps

(iv) Any other systems required to maintain occupied temperature set point during winter design conditions.

(c) Building Automation System

(d) Fire alarm system

(e) Security, Intrusion, Access Control systems

(f) Roll shutters

(g) Elevator recall (not full operation)

(h) Network racks (IT services)

(i) Public Address System

(j) All fridges and freezers in Home Ec/foods, Staff rooms, Servery.

(k) Sump pumps, lift stations etc as required.

8.7.8.4 Generator shall be at minimum rated 200 KW continuous standby, 250 KVA at 0.8 PF, connected for operation at 347/600 Volts 3 phase, 4 wire, complete with the following options and accessories (sized to suit above loads):

(a) Meter package

(b) Water jacket heater

(c) Residential silencing muffler

(d) Weather-proof protective housing.

(e) PMG excitation.

(f) Electronic governor.

8.7.8.5 Transfer Switch:

(a) Provide CSA approved automatic transfer switch rated as per the single line diagram. Transfer switch shall be approved for use by the power utility.

(b) Transfer switch shall be complete with the following:

(i) Heavy duty industrial switch, double throw action, motor operated, electrically and mechanically interlocked to prevent simultaneous closing.

(ii) Open transition style.

(iii) Manual operating handles and controls, accessible only by opening the cabinet doors.

(iv) EEMAC 3R enclosure with key-locking front door.

(v) Adjustable time delay to start standby engine, 0-20 seconds.

(vi) Adjustable time delay neutral position, 0-60 seconds, (for motor loads).

(vii) Adjustable time delay for re-transfer from emergency to normal after restoration of normal power, 5-180 seconds.

(viii) Adjustable pre-transfer time delay, 0-60 seconds, with dry contact (for elevators).

(ix) Test switch for test, normal and retransfer conditions.

(x) Control mode indicator status LED's.

(xi) Running time meter.

(xii) Two sets of N.O. and N.C. auxiliary contacts.

(xiii) Single side bypass isolation feature.

8.7.8.6 Remote Alarm Annunciator:

(a) Remote alarm annunciator shall be complete with the following lamp indications:

(i) High Battery Voltage

(ii) Low Battery Voltage

(iii) Normal Battery Voltage

(iv) Generator Running

(v) Normal Utility Power

(vi) EPS Supplying Load

(vii) Pre-Low Oil Pressure

(viii) Low Oil Pressure

(ix) Pre-High Coolant Temp

(x) High Coolant Temp

(xi) Low Engine Temp

(xii) Overspeed

(xiii) Overcrank

(xiv) Not in Auto

(xv) Battery Charger Malfunction

(xvi) Fault

(xvii) Provide all necessary contacts in generator control panel and/or transfer switch to make system operational.

8.7.8.7 Factory Test Procedures:

(a) Provide factory tests, including a four hour 100% full load test, utilizing a resistive bank.

(b) During test, the following parameters shall be recorded at fifteen-minute intervals:

(i) Speed and frequency

(ii) Voltage and current per phase

(iii) Load

(iv) Coolant temperature

(v) Lubricating oil pressure

(vi) Alternator casing temperature

(vii) Ambient temperature

(viii) Engine water temperature

8.7.8.8 Additionally, record the following data:

(a) Cranking time required to start engine from ambient temperature.

(b) Time required to start the engine after the starting contact is made.

(c) Time from initiation of start to full load application, with voltage and frequency settled.

(d) Time required to stop the engine after the stop contact is opened.

(e) Time required for the alternator to deliver the full voltage frequency after full load is switched 'On'.

(f) Record battery voltage drop during cranking.

8.7.8.9 Report on torsional vibration of the generator set.

8.7.8.10 Six copies of certified test results shall be submitted upon completion of factory test procedure.

8.7.8.11 Provide an standby generator certificate confirming unit start-up under maximum demand prior to energization.

8.7.8.12 Installation:

(a) Connect all auxiliary equipment and connect transfer switch to generator and to main and standby distribution systems. Connect any associated electrical equipment to the emergency distribution system. Install locks on all branch circuit breakers supplying components of the standby generating system including water jacket heater, battery charger, etc. Do all work in accordance with the requirements of the manufacturer.

8.7.8.13 On Site Test Procedure:

(a) After the installation is complete, including the work of others, obtain the manufacturer's certification that the work is satisfactory and the unit is ready for the on-site test. Conduct an on-site test in conjunction with the manufacturer. Advise Engineer at least three working days in advance of the test. Provide sufficient load to test the unit as required.

(b) From a "cold start" condition, emergency load shall be as per the worst-case load conditions. Continue this test for one hour and observe and record the following:

(i) Time delay on start

(ii) Cranking time until engine starts and runs

(iii) Time required to reach operating speed

(iv) Time required to achieve a steady state condition with emergency load on line

(v) Voltage, frequency and amps at start up and at any observed changes in load, i.e. start and stop the largest motor three times during this test

(vi) Engine oil pressure, water temperature and battery charge rate at 5 minute intervals for first 15 minutes and at 15 minute intervals thereafter

(vii) Time delay on retransfer to normal power

(viii) Time delay on engine cooldown and shutdown

(c) Following the one hour test as outlined in Item 2 above, the generator shall be subjected to a four hour 100% load test. Record data required in Item 2 above at start up and every 15 minutes thereafter until completion of this test period.

(d) Provide manufacturer's certification that the unit has been manufactured, installed and tested in complete conformance with the drawings and specifications and the testing has indicated satisfactory operation.

8.7.8.14 Demonstration:

(a) Provide a demonstration of the automatic starting system and of the safety features for the owner prior to substantial completion of the project.

(b) Demonstration shall include the use of maintenance tools, etc. as supplied with generator.

8.7.9 Power Distribution Design

8.7.9.1 Basic Requirements

(a) The Design-Builder will satisfy the following design requirements for the power distribution system:

(i) Submit site plan and single line diagram detailing power service requirements to the building.

(ii) Install exterior pad mounted transformer in coordination with BC Hydro. Final location of exterior pad mount transformer will be approved by the Owner

(iii) Provide housekeeping pad for all floor mounted distribution equipment.

(iv) Provide all required underground primary ducts from BC Hydro power pole or recessed service box (off-site) to the BC Hydro pad mounted transformer. Provide underground duct installation to BC Hydro standards.

(v) Provide all required underground secondary ducts from the BC Hydro pad mounted transformer to the main distribution center in the main electrical room. Provide underground duct installation to BC Hydro standards.

(vi) Coordinate exact routing of underground services with supply authorities prior to installation.

(vii) Distribution equipment and systems will be robust, reliable, easily operated and maintained and be designed with 25% extra capacity to accommodate load growth, equipment additions, and changes.

(viii) Distribution equipment will be of a “specification grade” and “institutional" or “industrial" quality and not of a “light duty” or “commercial” quality.

(ix) Appropriate drip shields or sprinkler proof enclosures will be provided for all electrical equipment located in areas protected by a sprinkler fire protection system.

(x) All secondary power distribution equipment will be from the same manufacturer.

(b) Acceptable manufacturers: Schneider, Eaton Cutler-Hammer, and Siemens.

(c) The Design-Builder will provide:

(i) Lamicoid name tags indicating name of building, name of manufacturer, contractor, date installed and system specifications.

(ii) Shock and arc flash protection and warning labels on all electrical distribution equipment in compliance with the latest editions of C.E.C. 2-206 and NFPA 70E and ANSI Z535.4.

(iii) Short circuit calculations for the distribution center based on actual feeder lengths and sizes. Obtain available fault level information from power supply authority for the short circuit calculations as required.

(d) The Design-Builder will provide a power system study that includes a short-circuit study, protective device coordination study, and an arc flash incident energy analysis.

(e) The Design-Builder will incorporate design features and practices to reduce arc flash hazards on electrical systems such that routine operations such as inspection and maintenance activities will require PPE Level 2 (as defined in NFPA 70E) and no activities will expose personnel to arc flash hazards which exceed the protection afforded by PPE Level 2.

(f) The Design-Builder will be responsible to provide an arc flash study for all distribution including panel boards complete with field labeled warnings of potential electrical shock and arc flash hazards per rule 2-306 on each panel.

(g) The Design-Builder will provide a coordination study as per the following requirements:

(i) Produced by the manufacturer of the switchgear. Coordination study must be submitted and approved prior to shop drawing submission of primary and secondary breaker types.

(ii) Include the main primary feeder protective devices in the utility system, transformer damage curves, and all proposed main and secondary breakers for the distribution system in order that complete selective coordination of the system will be demonstrated.

(iii) Plot on log graph paper with the base voltage shown and will be accompanied by individual time current trip curves of each device in order to enable the Professional Engineer to verify the ratings and settings selected. Switchgear manufacturer to indicate the ratings and settings selected.

(iv) Submissions and approval will verify the ratings and settings of all protective devices. Approval will not eliminate the responsibility of the Design-Builder and manufacturer to provide proper selective coordination.

(v) Submit the coordination study in report form (PDF).

(vi) Power system coordination study must be submitted prior to distribution shop drawings. No distribution shop drawings will be reviewed until a satisfactory coordination study is submitted.

(vii) Prior to final inspection, the Design-Builder will arrange for switchgear manufacturer to visit the site and check all settings to ensure that they are in accordance with coordination study values. Provide results of the manufacturer review to the Owner in report form.

8.7.9.2 Performance Requirements

(a) The Design-Builder will provide and install major electrical equipment, which includes but is not limited to transformers, main distribution centres, transfer switches, mechanical distribution panels, and power factor correction equipment which satisfies the following:

(i) Equipment is grouped together 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. Electrical equipment will be located with the intention of minimizing length of feeders and branch circuits and will be located so as to provide a clean, dry, safe, accessible installation protected from unauthorized access.

(ii) The main distribution centre will be rated at 600 volts, 3-phase.

(iii) Distribution transformers will be harmonic mitigating type.

(iv) Sub- distribution panels and branch panelboards will be rated at 120/208 volt, 3-phase, 4-wire.

(v) Mechanical distribution equipment to be rated at 600 volt, 3-phase, 3 wire and/or 120/208 volt, 3-phase, 4-wire.

(vi) Motor starters will be combination circuit breaker type, CEMA or NEMA rated (IEC rated starters are not acceptable).

(vii) Lighting, receptacle and mechanical equipment will be separately digitally metered.

(viii) Existing Gymnasium will be separately digitally metered.

(ix) Childcare space will separately digitally metered or with a separate utility meter.

(x) All lighting to be 120 volt, except 347 volt site lighting will be acceptable for pole-mounted luminaires. Motors 0.5HP and larger to be 3-phase, 208 or 600 volt.

(xi) Shop equipment will be served by a dedicated panelboard per shop, controlled via a contactor and key operated switch and remote red emergency “mushroom head” pushbuttons located strategically around the room. In addition to the emergency shut-off controls, shop equipment which is served by a dust collection system will be interlocked with the dust collector control panel to prevent the operation of the shop equipment until the dust collection system is running. General power and non-shop equipment loads are to be served by a separate, non-contactor-controlled panelboard.

(xii) All components of power distribution systems will be selected, configured, located, and installed to minimize the transmission of noise, vibration and unwanted heat into other parts of the Facility.

(xiii) Protection and coordination of protection equipment will be designed and installed 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 adequately protect against injury to persons and damage to property. Only breakers will be used for power distribution over current devices.

(xiv) Provide a short circuit analysis 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 to the Owner and the Owner's Representative for review.

(xv) Where required by system characteristics or operational requirements, special shielding, isolation, grounding, bonding, harmonic filtration or other treatment will be provided to prevent interference between systems or degradation of performance of an individual system.

(xvi) Electrical rooms will be located with due regard to future expansion. Provide 20% extra physical space in distribution centres.

(xvii) Components of the power distribution systems which are in any public, administrative or staff area will be 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 recessed electrical panels and wiremold, light switches, occupancy sensors, receptacles, wire ways, equipment grounding points, and status displays.

(xviii) Single phase 120VAC grounding receptacles conforming to CEC and specifically to CSA.Receptacles will be provided where required by equipment.

(xix) Provide 20 ampere, CSA configuration 5-20R receptacles every 5 metres in areas not described in Appendix 1B – Room Data Sheets. No more than three duplex receptacles will be on a single circuit.

(xx) All receptacles will be specification grade and will be provided with stainless steel cover plates. Grouped receptacles will have a single cover plate covering the entire group. Receptacles will be white colour or as determined in consultation with the Owner.

(xxi) Line voltage switches will be specification grade, 120 volt, 20 ampere. 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 or as determined in consultation with the Owner.

(xxii) All switches, receptacles, panelboards, and motor starters will be suitably identified. Panelboards will be supplied with type- written directories. All receptacles and light switches will be permanently marked with machine printed labels (clear label with black lettering) identifying the circuit and panel number. Lamicoid nameplates will be provided for all distribution equipment including switchboards, panelboards, transformers, motor control centres, disconnect switches, motor starters, and contactors.

(xxiii) 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. Install marker plates on the exterior wall immediately above the point of entry.

(b) The Design-Builder will provide the main switchboard to be a fully integrated assembly consisting of an incoming service wire way, main breaker, utility compartment, and distribution panel. The switchboard will be rated 347/600 volt, 3 phase, 4 wire, amperage to suit calculated load plus 15% spare capacity, of solid neutral design. The complete switchboard will be factory assembled and tested prior to delivery to site.

(i) Acceptable manufacturers: Schneider, Siemens, Eaton Cutler-Hammer.

(c) The Design-Builder will provide the main breaker as per the following requirements:

(i) 3-pole, molded case circuit breaker, rated as required.

(ii) Breaker to be complete with handle projecting through front cover; provide with lock-off facility.

(iii) Main breaker to be complete with RMS sensing digital trip unit with adjustable settings for long, short and instantaneous trips, complete with ground fault protection (if required by code).

(d) The Design-Builder will comply with BC Hydro requirements and regulations.

(e) The Design-Builder will provide distribution as per the following requirements:

(i) Distribution panel to consist of an assembly of molded case circuit breakers of the frame size, trip rating, and number of poles required to suit the project. Provide two 3P- 100 amp, and two 3P-200 amp spare breakers.

(ii) All breakers will have an interrupting capacity of not less than the calculated RMS symmetrical fault current at 208 volts.

(iii) At least 20% of the distribution panel and panelboards space will be left empty, provisioned for future installation of additional breakers.

(f) The Design-Builder will provide the main bus bar connections and risers to be clearly identified with phase markings A, B and C throughout. Bussing to be rectangular section, tin plated copper. All joints to be securely bolted to manufacturer’s recommendations. All bussing to be braced for a minimum 50,000 amps RMS symmetrical fault.

(g) The Design-Builder will provide enclosures as per the following requirements:

(i) The switchboard will be totally enclosed in sheet metal panels with front panels of formed type construction. Internal barriers to be provided to separate the various compartments. The enclosure will be of uniform height, depth and width throughout.

(ii) Provide suitable bushed ports or buspads in barriers between compartments.

(iii) Enclosure to be provided complete with drip shield.

(iv) Flush and/or surface mounted complete with panel trim having concealed hinges and trim mounting screws.

(v) All panels will have a hinged lockable door with flush catch.

(vi) Provide two keys for each panel, interchangeable with panels of same voltage.

(vii) Provide sprinkler drip protection for all surface mounted panels.

(viii) All surface mounted tubs to be finished in enamel over corrosion-resistant primer. Finish colour will be ASA 61 Grey for 120/208V panels and ASA 610 Sandstone for 347/600V panels and equipment.

(h) The Design-Builder will provide panelboards as per the following requirements:

(i) Unless indicated otherwise, all panelboards will be 120/208V, 3 phase, 4 wire, solid neutral design with sequence style bussing and full capacity neutral, composed of an assembly of bolt-in-place molded case circuit breakers as indicated with thermal and magnetic trip and trip free position separate from either the "On" or the "Off" positions.

(ii) Two and three pole breakers to have common simultaneous trip.

(iii) Surface or flush mounted to suit. Locate all panels in designated Electrical or other Service Rooms, except Communication Rooms unless the panel is serving that Communication Room. Panels are not to be located in Corridors or Classrooms (may be located in Shops as noted in the Room Data Sheets).

(iv) Provide all mounting brackets, busbar drillings and filling pieces for spaces.

(v) Affix typewritten directory to the inside cover of panelboard indicating loads controlled by each circuit.

(i) The Design-Builder will provide over current protection devices as per the following requirements:

(i) Install over current protective devices in accordance with manufacturer's written instructions.

(ii) Fasten over current protective devices without causing mechanical stresses, twisting or misalignment of equipment in final position.

(iii) Provide manufacturer's product data for all devices.

(iv) Shop drawings will include the following information:

1. Fault interrupting capability of each device in symmetrical amperes at applied voltage.

2. Confirmation from the manufacturer that any devices used in series to obtain a specified fault current interrupting capacity are rated for such use.

3. Motor control over current protective device characteristics and curves.

(j) Supply all molded case circuit breakers by a single manufacturer and as per the following:

(i) CSA C22.2 No. 5-M1986.

(ii) Trip Type: Thermal/magnetic.

(iii) Voltage: To suit project requirements.

(iv) Poles: To suit project requirements.

(v) Interrupting Capacity: To suit project requirements.

(vi) Mounting: Bolt-in place.

(vii) Normal Operation: In 40°C ambient.

(viii) Features:

1. Thermal and instantaneous magnetic trip.

2. Trip free, toggle type operation.

3. Quick-make, quick-break action.

4. Positive handle trip indication.

5. Trip rating visible with panel trim installed.

(k) The Design-Builder will provide Surge Protective Devices (SPD) at the service entrance and throughout the power distribution system as per the following requirements:

(i) Comply with the following standards:

1. ANSI/IEEE C.62.41 and C62.45;
2. UL 1449 – 2nd Edition;
3. UL 1283;
4. NEC – NFPA 70
5. NEMA LS1; and
6. NFPA.

(ii) No audible noise will be generated.

(iii) No appreciable magnetic fields will be generated. System will be capable of use directly in computer rooms in any location without danger to data storage systems or devices.

(iv) Operating Conditions will be -1°C to 54°C (30°F to 130°F), 2 15% to 85% humidity non-condensing.

(v) The unit will have a heavy duty NEMA 12 dust-tight, drip-tight enclosure unless specified otherwise. Enclosure will be wall mountable. Integral panelboard SPD devices will exhibit performance as detailed in this specification and will include a barrier device to separate the SPD from the panelboard interior.

(vi) All distribution panels will have SPDs and will be rerated for 60 Hertz. The system and will be connected to the power distribution system per the manufacturer's recommendations.

(vii) The manufacturer will be ISO 9001 certified, demonstrating world-class quality systems for the design and manufacture of the SPD units.

(viii) Each surge suppression element (MOV) will be individually fused so that a failure of one element and/or fuse will not affect other surge suppression elements. SPD will have a short-circuit rating of 200kAIC.

(ix) Unit will include solid-state, long-life externally mounted LED visual status indicators that indicate the on-line status and operational integrity of each phase of the unit.

(x) Unit will have a Form C summary alarm output contact rated for at least 1 amp at 120VAC for remote annunciation of SPD status by the DDC system. Coordinate with DDC contractor to provide commissioning and testing of the SPD system interface with the DDC system for inclusion in the O&M manuals.

(xi) The SPD will be modular in design. Separate and replaceable suppression modules will protect each mode (L-N, L-G, and N-G).

(xii) The service entrance SPD will be capable of surviving 15,000 ANSI/IEEE, Category C3 (10kA) impulses without failure or degradation of original performance characteristics of more than 10%.

(xiii) The unit will have a maximum surge current rating of 125,000 amperes L-N, 125,000 amperes L-G, and 125,000 amperes N-G, based on ANSI/IEEE C62.41 standard 8 by 20 microsecond current waveform. Manufacturers will provide a higher maximum surge current rated device if required to meet the requirements. .5 Unit will be UL 1283 listed as an electromagnetic interference filter and provide 50 Ohm noise attenuation of at least 40 dB at 100 kHz, 30 dB at 1 MHz, 35 dB at 10 MHz, and 50 dB at 100 MHz.

(xiv) The unit will include a built-in, push-to-test feature that tests the integrity of all modules, MOVs and fuses in the system. Manufacturers that require an external test device to perform this feature will include the test set in this quotation.

(xv) The unit will have an audible alarm with an alarm on/off switch to silence the alarm and a push-to-test switch to test the alarm function.

(xvi) A resettable counter will be provided to totalize transient voltage surges in both the normal and common mode.

(xvii) The readout will be at least a six-digit LCD located on the unit front cover and provided with a 10-year battery back-up to maintain counts in the event of power loss.

(xviii) Provide an equipment manual with installation, operation and maintenance instructions for inclusion in the Operation & Maintenance Manuals. Instructions will include a list of all customer-replaceable spare parts, part numbers and ordering information.

(xix) The unit will be thoroughly factory-tested before shipment. Testing of each unit will include but will not be limited to quality assurance checks, MCOV and clamping voltage verification tests. A copy of the test results will be shipped with product and will be included in the maintenance manuals.

(xx) Manufacturer will provide a product warranty for a period of not less than 10 years from date of commissioning. Warranty will cover unlimited replacement of system protection modules during warranty period. The first 5 years of this warranty will include any field labor required to perform repair or replacement work.

(xxi) Units to be wall-mounted as close as practical to protected distribution, with leads twisted to minimize surge impedance. Provide overcurrent and short circuit protection as recommended by manufacturer.

(xxii) Conductors between suppressor and point of attachment to service equipment will be sized in accordance with manufacturer’s Shop Drawings and conductor lengths will be as short as possible and will not exceed 24”.

(xxiii) Suppressor ground will be bonded to the equipment grounding conductor and service entrance ground.

8.7.10 Service Rooms

8.7.10.1 Basic Requirements

(a) The Design-Builder will coordinate space requirements and the installation of mechanical and electrical work and will maximize accessibility for other installations, maintenance, and repairs.

(b) The Design-Builder will provide space in service rooms to ensure adequate service clearances are maintained as per the CEC and BCBC to provide periodic maintenance as well as allow future replacement of equipment without the removal of other non-associated equipment or services.

(c) The Design-Builder will comply with the clearance requirement and recommendations for all equipment and systems including TIA and BICSI.

(d) The Design-Builder will follow the manufacturer recommended clearances for all equipment.

(e) The Design-Builder will provide at least stair access to service rooms and roof areas. Ships ladders and hatches are not acceptable. Where maintenance or replacement of large equipment is foreseen, the Design-Builder will provide a means for access and removal of the equipment through the available access doors. All equipment is required to fit through the doors serving the service room in which it is located.

8.7.11 Metering

8.7.11.1 Basic Requirements

(a) The Design-Builder will provide detailed power quality and power consumption information at key points throughout the Facility via digital metering.

(b) The Design-Builder will provide a networked digital metering system, with terminals for maintenance and plant administration, and data transfer to the Building Management System.

8.7.11.2 Performance Requirements

(a) The Design-Builder will provide a metering system that meets the following requirements:

(i) Easy to read, locally displayed information for all distribution at primary voltage and for all distribution switchboards.

(ii) Historical data from the metering system network will be stored and will be capable of recalling data for a minimum of a week.

(iii) The metering system will not be dependent on power from the metered circuit for its operation and will be supported by a backup power source or sources, which ensures operation when the metered circuit is de-energized.

(iv) The electrical metering system will meter each of the following loads separately: total building electrical consumption, HVAC systems, interior lighting, exterior lighting and receptacle circuits. Meter the Existing Gymnasium as a separate load group. Final metering strategy and panelboard load mixing will be determined in consultation with the Owner.

(v) Provide BACnet output to connect to DDC for remote reading of all the 7650 meter's functions through the DDC system. Acceptable manufacturer: Power Logic ION PM7650 or acceptable equivalent.

(vi) Meters will incorporate Web service, built-in modem, direct data transfer, BACnet and Ethernet ports.

8.7.12 Wiring Methods and Materials

8.7.12.1 Basic Requirements

(a) The Design-Builder will utilize wiring methods and materials to provide safe, reliable and flexible electrical power, control, communication, data, and life safety systems in the Facility.

(b) The Design-Builder will check drawings of all other trades for proper coordination of electrical outlet locations.

(c) Mounting heights are from finished floor level to centre line of device outlet, unless noted otherwise.

(d) All electrical fittings, supports, hanger rods, pullboxes, channel frames, conduit racks, outlet boxes, brackets, clamps, etc., will have galvanized finish or enamel paint finish over corrosion-resistant primer.

(e) All panelboards and similar equipment to be factory finished in glass air dry enamel applied over corrosion-resistant primer. Matte or flat-type finish paint not acceptable. Factory finished units that are scratched or marked during installation or shipping to be touched up with matching spray-on air dry lacquer or, if required to provide a satisfactory appearance, completely refinished. Distribution equipment/panelboards will be finished in the following colours; RAL7035/ANSI 61 - 120/208 V normal power, RAL1001 – 347/600 V normal power, RAL1013 – emergency power.

(f) The Design-Builder will ensure all wiring is neatly and securely installed in such a way that it is protected from damage, not in conflict with mechanical or architectural components of the building and allows for future changes for the life of the Facility.

(g) The Design-Builder will provide emergency shut off switch in every shop to kill power for all equipment and outlets in the shop. The location of the switch and strobe will be determined in consultation with the Owner.

8.7.12.2 Performance Requirements

(a) The Design-Builder will provide conductors with a minimum conductor size to be #12 AWG. All conductors #8 AWG and larger will be stranded.

(b) The Design-Builder will provide control cable for Class 2 remote control and signal circuits as follows:

(i) Conductor – copper;

(ii) Insulation - 300V insulation, rated 60EC.;

(iii) Individual conductors twisted together, shielded and covered with a PVC jacket; and

(iv) Wiring for fire alarm, security systems and public address systems as recommended by system manufacturer.

(c) The Design-Builder will provide:

(i) Conduit or cable tray of all intrusion alarm and door access control wiring.

(ii) Conduit for wiring for equipment and devices in corridors and in masonry walls.

(iii) Copper grounding conductors and straps.

(iv) All ground conductors to have green insulation jacket.

(v) T90 insulation is acceptable for use for grounding conductors only.

(vi) Power and infrastructure for two washroom lifts.

(vii) Clip groups of feeder conductors at all distribution centres, pullboxes and termination points.

(d) The exact routing and lengths for conduit will be coordinated by the Design-Builder, taking into account all ceiling types, dropped bulkheads, beams, mechanical equipment, ducts and piping.

(e) All voltage drop calculations will be based on the latest edition of the Canadian Electrical Code, Part I, and will assume a current of 80% of the rating of the circuit overcurrent protection device specified for each respective circuit. (e.g., for a circuit with a 15A breaker, assume a 12A current for the voltage drop calculations).

(f) When exact run lengths are determined for all branch circuits, and prior to installation of the conductors, ensure that the maximum voltage drop does not exceed 3%. In any case, unless noted otherwise or proven acceptable by proper voltage drop calculation, the minimum wire size for 120 volt branch circuits will be as follows:

(i) 0-30m (0-100') long - #12 AWG.

(ii) 30-50m (100'-165') long - #10 AWG.

(iii) 50-80m (165'-265') long - #8 AWG.

(g) The Design-Builder will provide FT6 rated wiring in all air plenums as required by the local Authority Having Jurisdiction. Confirm plenum locations with the Design-Builder's mechanical consultant prior to rough-in.

(h) The Design-Builder will provide switches as per the following requirements:

(i) Unless noted otherwise, line voltage switches will be rated for 120 volt, 15 amp operations with quiet, quick make/break toggle movement and totally enclosed case. 3-way and 4-way switches to be of matching type.

(ii) Colour to be white or as determined in consultation with the Owner.

(iii) Coordinate switch mounting heights with architectural detail and adjust, if required, to coordinate with paneling, dados, and masonry course lines.

(iv) Mount switches according to heights indicated later in this section.

(i) All conductors and all conducting components of electrical equipment, which form part of the wiring systems in the Facility, will be:

(i) Non-alloyed copper, except conductors and conducting components equal to or larger than 150 amp or 1/0, aluminum is permitted.

(ii) R90 cross-linked polyethylene.

(iii) Sized to ensure a voltage drop of not more than 2% for feeders and 3% for branch circuits.

(iv) Installed in conduit.

(v) Type AC-90 armored cable will be used for final connections to light fixtures (3m maximum length). Daisy-chaining of AC-90 cables between luminaires is not permitted.

(vi) In exposed ceiling areas, all wiring will be in conduit painted out to match ceiling.

(vii) Neutral conductors will be fully rated.

(viii) Concealed except in service rooms.

(ix) Protected from mechanical damage throughout each wiring system. Entry or accumulation of moisture into any wire, cable, or wire way will be prevented.

(x) Suitable to the application used for. Wiring for systems of different voltages and from different sources of supply will be separated. Interference between wiring of power supply systems and wiring of data and telecommunication systems will be prevented by maintaining adequate separation and shielding throughout.

(xi) Components which are in any public, administrative or Staff area will be 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.

(xii) Clearly labelled at both ends.

(j) The Design-Builder will provide receptacles and branch circuit wiring throughout the building. The locations and quantity of receptacles are to be provided for convenience and equipment in accordance with the RFP and layouts developed in consultation with the Owner.

(k) The Design-Builder will provide while-in-use covers for all exterior outlets and receptacles.

(l) The Design-Builder will provide connections for wayfinding signage including perimeter signage to enter the Facility.

(m) The Design-Builder will provide drop cords receptacles with twisty-lock connectors as determined in consultation with the Owner to suit layout.

(n) The design-Builder will provide a minimum of one 4-plex receptacle adjacent to the telephone/data outlets at every Staff work or teacher station. Additional receptacles will be provided for convenience power in accordance with the RFP.

(o) The Design-Builder will provide receptacles and components as per the following requirements:

(i) The Design-Builder will provide duplex receptacles in accordance to FFE requirements, and additional duplex receptacles every 5m for convenience in Common Area.

(ii) All receptacles accessible to students will have two connectors for USB3.1. One connection to be type A and one connection to be type C.

(iii) 30 amp and 50 amp receptacles in the Gymnasium for use of portable production dimming and sound equipment.

(iv) One duplex receptacle and 25mm (1") conduit for future structured cabling to each TV location as per Appendix 1B - Room Data Sheets unless noted otherwise.

(v) Tamper-resistant receptacles: Pass & Seymour PTTR5262 (15A) or PTTR5362 (20A t-slot) or approved equivalent.

(vi) GFCI receptacles: Pass & Seymour PT1595 (15A) or PT2095 (20A t-slot) or approved equivalent.

(vii) Red receptacles on emergency or UPS power.

(viii) White receptacles in all other areas or as determined in consultation with the Owner.

(ix) Receptacles mounted above or within millwork to be coordinated with millwork details and millwork contractor.

(x) All cover plates for flush-mounted wiring devices in areas with drywall walls will be stainless steel.

(xi) All steel components will be hot dip galvanized to CSA Standards.

(xii) Stainless Steel: Type 430, No. 4 finish, 1 mm thick, accurately die cut, smooth rolled outer edges and protective release film complete with stainless steel screws.

(xiii) Cast Metal: Die cast profile, ribbed for strength, flash removed, primed with grey enamel finish and complete with four mounting screws to box.

(xiv) Gaskets: Resilient rubber or close cell foam urethane.

(xv) Flush Mounting Plates: Beveled type with smooth rolled outer edge, plain design.

(xvi) Outlet cover plates for wall mounted handsets will be stainless steel complete with steel mounting studs. Confirm coverplate is suitable for handsets to be installed prior to ordering.

(xvii) Surface Box Plates: Beveled, pressure formed for smooth edge free fit to box.

(xviii) Weatherproof Plates: Cast metal gasketed coverplates for receptacles, spring loaded cast gasketed doors. Double doors for standard duplex receptacles. Coverplates to fasten to box by four screws.

(xix) Acceptable manufacturers: Pass and Seymour, Thomas & Betts.

(xx) Install coverplates on all wiring device boxes.

(p) Mounting Height Requirements

(i) Wall receptacles will be mounted 356mm (14”) above finished floor. Generally, outlets installed above counters or work-tables will be mounted 150mm (6”) above the finished surface. Outlets will be either entirely within or above splashboards.

(ii) Fire alarm audio signaling devices will be mounted 2440mm (96”) above finished floor or 300mm (12”) below the ceiling, whichever is lower. Where signaling devices are mounted adjacent to other surface mounted devices, the centres will be aligned.

(iii) Fire alarm visual signaling devices will be mounted 2000mm (78”) above finished floor or 300mm (12”) below the ceiling, whichever is lower. Where signaling devices are mounted adjacent to other surface mounted devices, the centres will be aligned.

(iv) Fire alarm manual pull stations will be mounted 1050mm (42”) or 1150mm (45”) above finished floor to comply with accessibility requirements.

(v) Local branch circuit lighting switches will be mounted 1050mm (42”) above finished floor. Local lighting switches will be installed on the strike side of the door.

(vi) Telephone outlets will be mounted 356mm (14”) above finished floor. Wall mounted telephone handset outlets will be mounted 1400mm (55”) above finished floor. Coordinate location so handset cords do not drape over light switches or other devices.

(vii) Data and CATV outlets will be mounted 356mm (14”) above finished floor.

(viii) Security keypads and proximity readers will be wall mounted 1400mm (55”) above finished floor.

(ix) The Owner reserves the right to change location of outlets to within 3m (10’) of points presented by the Design-Builder without extra charge provided the Design-Builder is advised prior to installation.

(x) Where two or more outlets are shown in the same proximity, they will be either centered on a vertical line or centered on a common horizontal line, whichever is most appropriate.

8.7.13 Junction Boxes and Raceways

8.7.13.1 Basic Requirements

(a) The Design-Builder will provide institutional or industrial quality cables, connectors, conduit systems, fittings and hardware. The Design-Builder will select and install such equipment to provide for high levels of reliability, durability and ease of maintenance of the equipment.

(b) All pullboxes and junction boxes will be of code gauge steel construction and/or cast corrosion-resistant type, conforming to Canadian Electrical Code, with screw-on or hinged cover.

(c) All pullboxes, junction boxes and conduits will be identified with purpose-manufactured durable and clearly legible marking to identify the function and voltage of the system.

(d) The Design-Builder will not exceed 50% of the maximum fill for back boxes and junction boxes.

(e) Approved fire stopping will be installed and maintained at all fire separations and at any locations required by code or by the Authority Having Jurisdiction.

(f) The Design-Builder will provide and install raceways for wiring and cabling to support, protect and organize wiring and cabling systems throughout the Facility.

(g) The Design-Builder will design and install raceways 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.

(h) Surface conduits will run parallel or perpendicular to building lines in flanged portion of structural steel. Group conduits wherever possible on suspended or surface channels. Conduits will not pass through structural beams.

8.7.13.2 Performance Requirements

(a) The Design-Builder will:

(i) Provide pullboxes and junction boxes as required to suit job conditions.

(ii) Locate pullboxes and junction boxes above removable ceilings, in electrical rooms, utility rooms or storage areas. All pullboxes must be positioned and installed in such a way that they are within 1m of an accessible ceiling area or hatchway.

(iii) Provide overlapping covers with flush head cover retaining screws, prime coated and painted to match wall or ceiling finish where pullboxes are flush mounted.

(iv) Install junction boxes in areas that are accessible through luminaire openings and/or access panels.

(v) Provide matching type and gasketed covers on cast corrosion-resistant boxes.

(vi) Provide lamicoid name tags to box covers with 9.5mm (0.35”) lettering identifying system on pullboxes and/or junction boxes that are not a standard 100mm square or octagon box, over and above paint identification for system.

(vii) Support all pullboxes and junction boxes directly from building structure using one or a combination of the following devices:

1. Galvanized screws;

2. Galvanized bolts;

3. Galvanized rods; or

4. Approved box clip.

(viii) Provide bushings on all conduit ends.

(ix) Cap all unused conduits.

(x) Provide cable tray and the following:

1. minimum 25mm (1") EMT conduit from each communications outlet box stubbed into cable tray; and

2. 12 tagged pull cords in cable tray for future use by the Owner.

(b) The Design-Builder will provide a minimum of 3 x 103mm riser sleeves or ducts for all Electrical Rooms and Telecommunications Rooms from main respective rooms. Where group of rooms are stacked, provide one additional 103mm riser sleeve or duct for every additional room serviced from a riser stack. For example: Where there are 3 TRs in a riser stack, one on each level where level 1 is the beginning of the riser and level 3 is the end; provide the following telecommunications riser:

(i) Level 1 – provide 5 x 103mm riser sleeves or ducts;

(ii) Level 2 – provide 4 x 103mm riser sleeves or ducts; and

(iii) Level 3 – provide 3 x 103mm riser sleeves or ducts.

(c) The Design-Builder will not exceed 28% conduit-fill as well as no more than two 90-degree bends (or equivalent) in any conduits.

(d) The Design-Builder will provide conduits according to the following requirements:

(i) Conserve headroom in exposed locations and cause minimum interference in spaces through which they pass.

(ii) Conceal conduits except in mechanical and electrical service rooms.

(iii) Use rigid galvanized steel threaded conduit in areas as shown on drawings.

(iv) Use epoxy coated conduit in corrosive areas.

(v) Minimum conduit size for lighting and power circuits: 21 mmC.

(vi) Bend conduit cold.

(vii) Replace conduit if kinked or flattened more than 1/10th of its original diameter.

(viii) Mechanically bend steel conduit over 19 mm diameter.

(ix) Field threads on rigid conduit must be of sufficient length to draw conduits up tight.

(x) Run 3-52 mm spare conduits up to ceiling space from each flush panel.

(xi) Terminate these conduits in 600 x 300 x 150 mm junction boxes in ceiling space.

(xii) Remove and replace blocked conduit sections.

(xiii) Do not use liquids to clean out conduits.

(xiv) Dry conduits out before installing wire.

(xv) Run surface conduits parallel or perpendicular to building lines. Locate conduits behind infrared or gas fired heaters with 1.5 m clearance. Run conduits in flanged portion of structural steel. Group conduits wherever possible on suspended or surface channels. Do not pass conduits through structural members except as indicated. Do not locate conduits less than 75 mm parallel to steam or hot water lines with minimum of 25 mm at crossovers.

(xvi) Run concealed conduits parallel or perpendicular to building lines. Do not install horizontal runs in masonry walls. Do not install conduits in terrazzo or concrete toppings.

(e) Slope underground conduits to provide drainage. Waterproof joints (PVC excepted) with heavy coat of bituminous paint.

(f) Seal conduits wherever they leave a heated area and enter an unheated area. Provide 12mm (1/2") minimum duct seal in addition to other sealants.

(g) Provide necessary flashing and pitch pockets to make watertight joints where conduits pass through roof or exterior walls.

(h) Utilize approved expansion fittings complete with grounding jumper where conduit, wireways, and raceways, installed in masonry walls or across building expansion and seismic joints. Install feeder runs of conduit in suspended ceiling spaces in such a manner that there is a bend or off-set adjacent to the major building expansion or seismic joint to take up building movement. In lieu of this, utilize approved expansion fitting.

(i) The Design-Builder will provide conduit supports as per the following requirements:

(i) Single Runs: Galvanized conduit straps or ring bolt type hangers.

(ii) Multiple Runs (three or more): Conduit rack with 25% spare capacity.

(iii) Except where otherwise noted, support conduit and cables utilizing clips, spring loaded bolts, or cable clamps designated as accessories to base channel members.

(iv) Where inserts are required in concrete, expansion inserts, lead inserts or plastic inserts will be used in drilled holes. Wood or fibre plugs are not permitted. Shot driven pins will not be used.

(v) Install to maintain headroom, neat mechanical appearance, and to support equipment loads required plus 25% spare load capacity.

(vi) Supporting devices to be connected directly to building structure.

(vii) Support exposed conduit and conduit installed in space above suspended ceilings utilizing hangers, clamps or clips.

(viii) Support conduit on each side of bends and on spacing in accordance with Canadian Electrical Code.

(ix) Do not fasten supports to piping, ductwork, mechanical equipment, or other conduit.

(x) Install surface mounted cabinets and panelboards with minimum of four anchors.

(xi) Bridge studs top and bottom with channels to support.

(j) The Design-Builder will provide outlet boxes as per the following requirements:

(i) All metal boxes will be hot dip galvanized steel, conforming to CSA Standards.

(ii) Outlet boxes in non-combustible construction will be galvanized steel, gangable sectional type sized to suit the number of conductors.

(iii) Outlet boxes on exterior walls will be cast corrosion-resistant deep type, Crouse Hinds FS and/or FD series, air tight with approved vapor barrier device, gasketed and sealed.

(iv) Boxes for ceiling to be Thomas & Betts No. 54151 receiving at least two 21mm (3/4") conduit; otherwise, No. 54171.

(v) Boxes for flush mounted switches, receptacles, and low tension outlet devices, except in masonry walls, to be Thomas & Betts No. 1104 or 52171 with matching plaster cover for single or two gang outlets. For larger boxes use GSB solid type or special units as required. In masonry work use Thomas & Betts CIMBS series boxes.

(vi) Boxes for surface mounted switches, receptacles, and low tension devices to be 100mm (4") square Thomas & Betts 52151 or 52171 with 8300 series tailor covers or 2020 series with matching cover.

(vii) Communication system (Voice & Data) and A/V system (Audio/Visual) outlet boxes will be two-gang, minimum 90mm deep masonry outlet boxes (MBD-2) or deep dual gang surface mount outlet boxes. When it is necessary to mount an outlet box in a wall depth of 65mm, a 65mm deep masonry willow two-gang outlet box (MBS-2) will be used. Unless specified to the contrary, an electrical box with a "mud ring" is not acceptable. Approved low voltage communication rings can be used where specified.

(viii) Flush floor boxes must be specifically designed to accommodate high performance communications outlets. Selection must be confirmed with the Owner during the design phase.

(ix) All outlet boxes to be flush mounted, except in service rooms and in spaces above removable ceilings. Flush mounted outlets will be mounted flush to the surface of the wall and all gaps at the edges of the outlet box will be filled and finished.

(x) Adjust position of outlets in finished masonry walls to suit masonry course lines. Coordinate cutting of masonry walls to achieve neat openings for all boxes. All cutting of masonry work for installation of electrical fittings to be done using rotary cutting equipment. Coordinate with the masonry contractor.

(xi) Where a two gang box is required for single gang device, provide plate with one gang opening designed to fit over a two gang box.

(xii) No sectional or handy boxes unless specifically requested.

(xiii) For outlets mounted in exterior walls ensure that there is insulation behind outlet boxes to prevent condensation through boxes.

(xiv) For outlets mounted above counters, benches, or splashbacks, coordinate location and mounting heights with built-in units.

(xv) Back boxes for all low tension system equipment to be provided in accordance with specific manufacturer's recommendations and as specified in the low tension sections of these specifications.

(xvi) Separate outlet boxes located immediately alongside one another to be mounted at exactly the same height above the finished floor. Where the outlet boxes contain devices of the same system, gang the boxes together.

(xvii) Where outlet boxes penetrate through a fire separation, ensure that they are tightly fitted with non-combustible material to prevent passage of smoke or flame in the event of a fire.

(xviii) For concrete slabs and tilt walls, the outlet boxes will be recess mounted flush in the concrete.

(k) The Design-Builder will provide conduit fasteners as follows:

(i) One hole steel straps to secure surface conduits 50mm and smaller.

(ii) Two hole steel straps to secure surface conduits larger than 50mm.

(iii) Beam clamps to secure conduits to exposed steel work.

(iv) Chanel type supports for two or more conduits at 1m on centre.

(v) Threaded rods, 6mm diameter, to support suspended channels.

(l) The Design-Builder will provide conduit fittings as follows:

:

(i) Comply with CAN/CSA C22.2 No. 18, manufactured for use with conduit specified. Coating same as conduit.

(ii) All EMT conduit fittings to be steel, set screw type. No die-cast.

(iii) All connectors to have plastic bushing.

(iv) Use only WP fittings for conduit installation exposed to weather or where penetrating an equipment drip hood.

(m) The Design-Builder will provide expansion fittings for rigid conduit as follows:

(i) WP expansion fittings with internal bonding assembly suitable for 100mm linear expansion.

(ii) Watertight expansion fittings with integral bonding jumper suitable for linear expansion and 19mm deflection.

(iii) WP expansion fittings for linear expansion at entry to panel.

(n) The Design-Builder will provide and install raceways that comply with applicable codes and will:

(i) Utilize EMT but rigid PVC conduit will 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.

(ii) Utilize flexible metallic conduit for vibration isolation of equipment such as motors and transformers. Liquid tight flexible metallic conduit will be used for mechanical equipment in damp or wet locations and for kitchen equipment connections.

(iii) Provide barriers to appropriately separate cables and conductors of different voltages or system types.

(iv) Only fill an equivalent of 25% of the calculated cross-sectional area of the tray including annular spacing between cables provided.

(v) Provide matching empty raceways equal to minimum 50% of the total installed group wherever multiple raceways are required in a group, such as a duct bank interconnecting two or more major areas.

(vi) Facilitate easy access to other systems and equipment, including mechanical equipment, building systems access ways, and architectural building components which require periodic inspection or maintenance.

(vii) Be designed and installed 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.

(viii) Be continuously bonded with a bonding conductor installed in raceway.

(o) The Design-Builder will provide:

:

(i) Pullstrings in all conduits.

(ii) Conduit identification as follows:

1. Colour code all conduits.

2. Located coding on all conduits and cables exposed after completion of building and in suspended removable ceilings.

3. Use paint for coding at all points where conduit or cable enters walls, ceiling, or floor, and at maximum 15 meter intervals.

4. Use 25mm wide prime colour:

	Prime Colour
Up to 250V	Yellow
Above 250V	Black
Telephone	Green
Communication Systems	Green
Fire Alarm	Red
Security Systems	Blue
Sound System	Orange
CCTV	Light blue
AV	Light green

(iii) Communications junction boxes will be minimum 300mm x 300mm x 150mm deep.

(iv) 78mm conduit from the electrical room to the roof for future photo-voltaic system panels. Provide approved roof jacks or other approved roof penetration.

(v) A 2@78mm conduit from electrical and Communications Rooms to the parking lot for future power. For electrical vehicle charging stations.

8.7.14 Lighting

8.7.14.1 The Design-Builder will provide a lighting system that complies with the following:

(a) Optimize the use of daylight achieved through a combination of Natural Light and luminaires complete with controls.

(b) All spaces will have a manual override for daylight harvesting.

(c) Exterior and interior lighting will create a safe and secure environment for students and Staff.

(d) Lighting will comply with all characteristics recommended by the Illuminating Engineering Society of North America (IESNA).

(e) Required Lighting Levels.

Teaching Areas	**Average**
Regular classrooms, reading areas, seminar rooms	500 - 700 Lux
Stack areas of Learning Commons	400 Lux
Laboratories, Shops, Drafting, Foods rooms	750 Lux
Gymnasium	1000 - 1200 Lux
Washrooms, change rooms, shower	300 Lux
Mechanical/Boiler/Electrical rooms	300 Lux
Offices	500 – 700 Lux
Storage Rooms	250 Lux
Hallways, Stairs	300 – 500 Lux

8.7.15 Luminaire Construction and Lighting Components

8.7.15.1 The Design-Builder will provide luminaires and light sources meeting the following requirements and standards:

(a) Selection of luminaires and light sources will meet 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 learning and education. All luminaires shall be LED.

(b) Luminaires in all areas will be constructed to require minimal cleaning and will permit practical and easy access and disassembly. All lighting components will be institutional grade.

(c) All luminaires shall have a glare ratio of less than UGR 19.

8.7.16 Exterior Lighting

8.7.16.1 The Design-Builder will provide LED exterior lighting according to the following requirements:

(a) Exterior luminaires will be vandal resistant type complete with LED light source.

(b) Lighting in parking areas will be an Area Light, single or multi-head pole mounted, dark sky compliant. Die cast aluminum housing, corrosion resistant polyester powder painted minimum 2 mil. thickness, structured LED arrays and optical assembly to optimize application efficiency and minimize glare, 80 CRI at 3000K, 50,000 hours at L85, lP65 rated optical enclosure.

(c) Cobra head style luminaires are not acceptable.

(d) Lighting in pedestrian & circulation areas will be low pole height guidance luminaires with ground washing optics. Luminaires shall be constructed with die cast aluminum housing, corrosion resistant polyester powder painted minimum 2 mil. thickness, structured LED arrays and optical assembly to optimize application efficiency and minimize glare, 80 CRI at 3000K, 50,000 hours at L85, lP65 rated optical enclosure.

(e) Lighting in building mounted area/flood lighting will be wall mounted area light, dark sky compliant. Cast aluminum housing, corrosion resistant polyester powder painted minimum 2 mil. thickness, structured LED arrays and optical assembly to optimize application efficiency and minimize glare, 80 CRI at 3000K, 50,000 hours at L85, lP65 rated optical enclosure.

(f) Lighting under canopies will be either surface mounted area light or recessed downlight, dark sky compliant. Die cast aluminum housing, opal polycarbonate lens, corrosion resistant polyester powder painted minimum 2 mil. Thickness.

8.7.17 Interior Lighting

8.7.17.1 The Design-Builder will provide and install interior lighting as per the following requirements:

(a) Lighting in areas where computer terminals and similar screens will be used will be specifically designed to eliminate direct and indirect glare and will meet or exceed the IES recommended cut off for VDT luminaires.

(b) Luminaires in classrooms and administrative office areas will be LED indirect/direct type (linear or recessed).

(c) Suspended/recessed luminaire acceptable manufacturers: Ledalite, Pinnacle, LiteControl, Finelite, Lumenwerx, Metalux or acceptable equivalent.

(d) Non regularly occupied spaces such as storage rooms, service rooms will have surface mounted or suspended LED strip luminaires complete with frosted lens and a wire guard.

(e) Suspended linear luminaire will include the following: direct-indirect optics, extruded aluminum housing, perforated housing, blade louver or semi-specular reflector down light optical control, length to suit, white or silver powder coat finish, suspended on aircraft cable.

(f) Recessed luminaire will include volumetric direct-indirect optics, frosted lens with low glare optics and white finish.

(g) LED recessed downlights will be considered for supplemental lighting in public areas, staff rooms and meeting rooms.

8.7.17.2 The Design-Builder will provide lighting in the Gymnasium with the following specifications:

(a) LED Industrial High—Bay, die cast aluminum driver housing, Semi frosted acrylic lens, powder finish on all die cast parts, field replaceable LED light engine and driver, DALI dimming driver, 100,000 hours at 45°C ambient at L70 lifetime. Acceptable manufacturers: Acuity IBE Series or acceptable equivalent.

8.7.18 Exit Lights

8.7.18.1 Basic Requirements

(a) The Design-Builder will mount exit lights to maximize visibility from all directions by adhering to the following:

(i) Mount clear of mechanical ductwork and piping.

(ii) Wall mount above exit doors wherever possible, otherwise when ceiling mounted provide adequate support for the outlet box independent of the ceiling.

(b) The Design-Builder will provide Exit lights in accordance with BC Building Code requirements and CSA C-860,

8.7.18.2 Performance Requirements

(a) The Design-Builder will provide exit lights according to the following requirements:

(i) Pictogram exit signs to be 120 to 347 volt universal AC dual tap with LED assemblies consuming a maximum total of 2 watts.

(ii) Housings to be extruded aluminum in all areas except:

1. Gymnasium will have soft-edge high abuse PVC housing.

2. Edge-lit c/w brushed aluminum finish in main entries.

(b) All emergency lighting will be powered from emergency power source (batteries.).

(c) Provide, and post, complete instructions within a framed glass display, on the operation and care of the emergency power supplies, including directives on mandatory testing at least once a month in compliance with CEC 46-102. These instructions are to be posted within the main electrical room or other location as directed by the Owner's maintenance personnel.

8.7.19 Lighting Control

8.7.19.1 Basic Requirements

(a) Lighting controls will comprise a significant part of both of the energy management of the Facility and of the flexibility required to adjust lighting to suit functions and activities. System shall be DALI protocol based, with lighting control panels distributed throughout as required to optimize the system. Minimum 20% room for expansion of devices including switches, luminaires and sensors shall be allowed for.

(i) DALI Lighting controls are not required in the following rooms and fixtures, which will be provided with local controls including at a minimum occupancy/daylight sensors and dimming switches:

1. Service rooms,

2. Storage rooms,

3. Offices serving a single occupant,

4. Washrooms, and

5. Exterior Luminaires.

(b) Lighting control shall include software (no subscription fees) with complete building mapping showing status of all devices. Owner shall have the ability to modify settings to optimize energy efficiency and building utility. The Design-Builder shall provide training for Owner staff on the operation and manipulation of the programming settings within the software.

(c) The Design-Builder will provide master low voltage switches in the General Office for all corridors.

(d) All lighting control panels shall be networked and connected to the school ethernet system.

(e) The Design-Builder will provide a complete programmed and commissioned lighting control system to control all interior and exterior luminaires. The system will include all panels, relays, transformers, approved BACNet low voltage relay controllers, low voltage controller programming, and any other devices required for a complete and operable system.

(f) The Design-Builder will provide the entire lighting control system, including switches, relays, cabinets, lighting controllers, switch wiring and luminaire wiring. The system will have a BACNet interface for the connection by the DDC contractor to the DDC system. All communication from the low voltage lighting system to the DDC system will be via a BACNet interface. A point to point interface is not acceptable. The Design-Builder will coordinate all work with DDC contractor.

(g) The Design-Builder will integrate occupancy sensor controls in corridors and other circulation areas with the BMS as required.

(h) Lighting control will permit simple and integrated control of lighting; controls will be easily operated and conveniently and appropriately located for each area and function.

(i) All lighting in corridors, public, and administration areas will be capable of being switched from the general office and the engineer's office. Install switching to allow for 50% of the general lighting to be turned off during low occupancy periods.

(j) Dimming of luminaires will be provided in classrooms, gymnasiums, shops and similar spaces to allow for lower lighting levels during presentations and similar events. Wall stations shall include 4 scene selection buttons, on/off, and raise lower buttons. Settings for each scene shall be directed by the Owner prior to system programming

.

(k) Integrate day-light harvesting and automatic dimming in instructional spaces, corridors and circulation areas where appropriate. Consider effective locations, mounting and ability to commission day light sensors.

(l) Where occupancy sensors are installed, other than washrooms, local switches will be provided in the room to allow the lights to be turned on manually and turned off automatically or manually. Automatic off after 15-30 minutes of room being vacated. Confirm off time duration with the Owner during design phase.

(m) Exterior lighting will be automatically controlled via a photocell and/or time clock, complete with manual override switches located in the general office and the main electrical room. Exterior lighting shall be dimmable with settings adjustable through the control system software.

(n) The Design-Builder will provide light programming as determined in consultation with the Owner.

8.7.19.2 Performance Requirements

(a) The Design-Builder will coordinate switch and cabinet mounting heights with architectural details and adjust, if required, to coordinate with paneling, dados, and masonry course lines.

(b) Switches installed in recessed boxes in Gymnasium and General Office will have beveled, hinged latching covers.

(c) Low voltage wiring will be per manufacturer requirements, colour coded and installed in conduit.

(d) Identify line voltage conductors of each relay and provide directory, attached to inside of cabinet door, correlating identification of conductor where area controlled by relay.

(e) The entire lighting control system will be commissioned by the contractor in coordination with the Design-Builder. Provide a copy of the Commissioning Reports and test in the Division 26 O&M manuals.

(f) The Design-Builder will provide two separate 4 hour demonstration for the lighting control system with the Owner's identified Staff.

(g) The Design-Builder will provide lighting controls rated for excessive moisture or chemicals that might cause deterioration where appropriate.

(h) The Design-Builder will zone and subdivide lighting in open and common areas to permit community use, energy management, and control of lighting levels.

(i) The Design-Builder will provide factory pre-assembled relay panels. The panel's enclosure will be for surface of flush installation, with a screw-on cover or a hinged door assembly as required.

(j) Where panels are provided in finished walls, the Design-Builder will provide spare conduit and infrastructure from the panel to the accessible ceiling for ease of maintenance in the future.

(k) DALI lighting control system shall be Cooper Fifth Light, or Osram Encelium.

8.7.20 Drama Classroom/Blackbox Theatre Lighting.

8.7.20.1 The Design-Builder will provide all infrastructure required for a theatrical lighting system.

8.7.20.2 The lighting will be designed by a theatre consultant, with the following minimum requirements. The Design-Builder will design lighting in consultation with the Owner. The Owner will advise on the system and lighting selection:

(a) All lighting shall be installed above the mesh ceiling on light rails/battens.

(b) Provide 6 fixed LED theatrical luminaires complete with five-color array, DMX/RDM in and thru, NFC, LCD display, aluminum housing and shutter barrels. Minimum 9,000 lumens.

(c) Provide 2 automated LED luminaires complete with linear colour saturation, zoom (6-50deg), DMX and ethernet inputs, multiple framing options, quiet motors for theatrical use, LED screen, minimum 20,000 lumens.

(d) Minimum 24 dimmers and 40 plug points.

(e) Dimmer systems will be UL and cUL listed.

(f) Four DMX outlets on each batten.

(g) Dimming console in control room and integration with general lighting.

(h) Fully digital dimmer cabinets designed specifically for architectural and entertainment lighting applications.

(i) Wall-mounted, convection cooled dimmer rack that does not require fans.

(j) Acceptable manufacturer: The control electronics will provide the following control and communication inputs as standard. The Design-Builder may recommend alternate manufacturers however the Owner reserves the right for final selection and approval prior to procurement.

(i) One optically isolated DMX512 control input.

(ii) An RS485 control input for Vision.net architectural control. Vision.net is a control system comprised of architectural style panels for recording and playback of presets in individual assigned "rooms".

(iii) There will be two programmable panic inputs.

(iv) One RS232 serial programming port for remote programming using PC based configuration software.

8.7.21 Miscellaneous Equipment Connections

8.7.21.1 Design-Builder will provide electrical power to all roll shutters for all windows exposed to grade. Provide momentary three position rocker switch above luminaire switch in each room for shutter control.

8.7.21.2 Design-Builder will provide electrical power to all door operators and integrate access control and panic systems.

8.7.22 Emergency Communications

8.7.22.1 Design-Builder will engage specialized consultant to design and install an emergency communications signal enhancement system to meet the local authority having jurisdiction emergency service providers requirements.

8.7.23 Mechanical Equipment Coordination

8.7.23.1 Basic Requirements

(a) The Design-Builder will provide electrical power to all mechanical equipment as required for proper operation, protection and maintenance of the equipment. Materials and installation methods will result in safe reliable and serviceable mechanical equipment and systems in the Facility.

(b) The Design-Builder will confirm final connections, loads and locations of motors prior to installation.

(c) Motors for mechanical equipment installed by the Design-Builder's mechanical contractor. Coordinate with final mechanical design drawings and shop drawings for locations and electrical requirements.

(d) Provide motor protection starters switches where required, coordinate with mechanical.

(e) Single phase manual motor protection switches to be either toggle or key operated complete with pilot light. Flush or surface mounted as indicated; key operated where indicated.

(f) In finished areas, provide flush mounted motor protection switches complete with stainless steel cover plates.

(g) Provide a separate disconnect switch on the line side of each starter.

(h) Provide disconnect switches for all equipment in accordance with CEC requirements.

(i) Install motor and circuit disconnect switches as required by Code.

(j) All disconnects to be complete with lamicoid name tags.

8.7.23.2 Performance Requirements

(a) The Design-Builder will:

(i) Provide institutional or industrial quality cables, connectors, conduit systems, fittings and hardware used to make connection to mechanical equipment and will be selected and installed to provide for a high level of reliability, durability and ease of maintenance of the equipment.

(ii) Provide connections to sinks with electronic hands-free type faucets.

(iii) 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.

(iv) Provide for the eventuality that equipment will be replaced in the future with upgraded and dissimilar equipment types and design connections to mechanical equipment accordingly.

(v) Three Phase Motor Disconnect Switches will be 3 pole, fused or unfused to suit, 250 volt as required in EEMAC Type 1, 3 and/or 4 enclosures.

(vi) All exterior disconnects to be weatherproof.

8.7.24 Poles and Pole Bases

8.7.24.1 Basic Requirements

(a) The Design-Builder will ensure the following:

(i) All poles and pole bases will be engineered to withstand local wind and ice loading conditions, as well as the weight of all equipment mounted on the pole.

(ii) Each pole will be CSA approved and will bear required marking(s).

(iii) Pole finish to be non-corrosive type. Paint to be applied via powder coat method.

(iv) Each pole base will be precast reinforced concrete and will be of size and configuration suitable for associated pole and electrical equipment. Bases will be pyramid style unless otherwise approved by the Owner.

8.7.24.2 Performance Requirements

(a) The Design-Builder will install all poles complete with TCT Wiresentry anti-theft protection, manufactured by Trans Canada Traffic, White Rock, BC.

(b) Approved Manufacturer's: Foxfab Metal Works Inc.; Nova; West Coast Engineering Group.

8.7.25 Fire Alarm

8.7.25.1 Basic Requirements

(a) The fire alarm system will be designed, supplied, installed, and commissioned by the Design-Builder to meet the latest applicable standards, including:

(i) CAN / ULC S524 Standard for Installation of Fire Alarm Systems;

(ii) CAN / ULC S537 Standard for Verification of Fire Alarm Systems;

(iii) Elevator Code CAN/CSA-B44;

(iv) ULC-S525 Audible Signal Appliances Fire Alarm;

(v) CAN/ULC-S524 Control Units Fire Alarm Systems;

(vi) ULC-528 Manually Actuated Signaling Boxes;

(vii) CAN/ULS-S529 Smoke Detectors Fire Alarm Systems;

(viii) ULC-S530 Heat Actuated Fire Detectors;

(ix) British Columbia Building Codes;

(x) Canadian Electrical Code; and

(xi) All requirements of the Authority Having Jurisdiction.

(b) All equipment and components will be new, and the manufacturer's current model.

(c) All equipment and components will be installed in strict compliance with manufacturers' recommendations.

(d) Terminal boxes, junction boxes and cabinets will be CSA/ULC listed for their purpose and use.

(e) Initiating circuits will be arranged to serve like categories (manual, smoke, water flow). Mixed category circuitry will not be permitted except on signaling line circuits connected to intelligent reporting devices.

(f) The FACP will contain a microprocessor based Central Processing Unit (CPU). The CPU will communicate with and control the following types of equipment used to make up the system: intelligent detectors, addressable modules, printer, annunciators, and other system controlled devices.

(g) Provide a Universal Digital Alarm Communicator Transmitter (UDACT) for communicating digital information between a fire alarm control panel and a ULC Listed central station.

(h) Provide an Active Graphic LED Annunciator with LED Alphanumeric display and Graphic Zone Map.

(i) Provide all waterflow, sprinkler, and stand pipe supervisory switches as per manufacturer's recommendations and switches will annunciate separately.

8.7.25.2 Performance Requirements

(a) Provide a fully addressable, single stage computer based fire alarm system throughout the Facility in accordance with all applicable codes and standards.

(b) The control panel will be housed in a ULC listed cabinet suitable for surface or semi-flush mounting. Cabinet and front will be corrosion protected, given a rust-resistant prime coat, and manufacturer's standard finish.

(c) The door will provide a key lock and will include a glass or other transparent opening for viewing of all indicators.

(d) All interfaces and associated equipment are to be protected so that they will not be affected by voltage surges or line transients.

(e) The alphanumeric display annunciator will be a supervised, back-lit LCD and LED active display containing a minimum of 80 characters for alarm annunciation in clear English text.

(f) The LCD annunciator will display all alarm and trouble conditions in the system and will be programmed to match graphic zone map labeling.

(g) LCD display annunciators will mimic the main control panel 80 character display and will not require special programming.

(h) The annunciator will have switches which will be programmed for system control such as, Global Acknowledge, Global Signal Silence and Global System Reset. Provide a keyed switch to disable these switch inputs on the front plate. Keying will be to the Owner's requirements.

(i) An active scaled, multi-color, high quality graphic floor plans indicating zone maps and key fire alarm information will be integrated into the annunciator with LED lighting up the various alarm and trouble zones. Provide a duplicate passive zone map in a metal frame adjacent to the fire alarm control panel.

(j) Submit the graphic zone map to the local fire department for approval prior to final production. Submit proof of acceptance by the fire department.

(k) The FACP will be addressable control panel. Acceptable manufacturer: Edwards IO 1000.

(l) Heat detectors will be mechanical type complete with addressable modules.

(m) Smoke detectors will be photoelectric type.

(n) Manual stations will be pull lever, wall mounted, semi-flush type, non-coded, dual action - single stage addressable.

(o) Auto dialer will be supplied by Owner and installed by the Contractor.

(p) Strobe Lights will be used for visible notification at 15/30/75/110 Candela, red with white lettering and synchronizing module as required. All horn locations will be combination horn/strobe. Additional strobes shall be installed where required.

(q) Audible Signal Devices including horns will be continuous sounding in accordance with the Owner's standards. Coordinate non-temporal pattern with the Owner and Authorities Having Jurisdiction.

(r) LED active graphic display remote annunciator will be provided with an LCD display readout.

(s) Provide 25% spare zones for future expansion.

(t) Provide indicators for trouble signals and silencing pushbutton.

(u) Provide annunciators in electrical room and at main entrance at a minimum.

(v) Provide record drawings, operation and maintenance manuals and fire alarm verification in accordance with this Agreement.

(w) The UDACT will be a remote device and will have the ability for remote mounting. Integral UDACT to the fire alarm control panel is not acceptable.

(x) The UDACT will transmit the following:

(i) Alarm signal;

(ii) Trouble signal; and

(iii) Automatic self-test report every 24 hours.

(y) The UDACT will have 60 hours of standby power. An alarm output contact for alarm or dialer failure will be connected to the fire alarm control panel to annunciate as "Dialer Trouble".

(z) The UDACT will be an Ademco V32FIREKT remote autodialer or equivalent. The Design-Builder will confirm with the Owner. The UDACT will be compatible with the fire alarm control panel.

(aa) Manual pull stations in high abuse areas (such as gymnasiums) will have tamper resistant covers and be recessed in a wall cavity.

(bb) Door holders will be 120V AC, flush mounted where possible,

(cc) Initiation Device Circuits (IDC) will be wired Class B.

(dd) Notification Device Circuits (NDC) will be wired Class B.

(ee) Alarm signals arriving at the main FACP will not be lost following a power failure (or outage) until the alarm signal is processed and recorded.

(ff) Power Supply:

(i) Circuit number will be clearly identified on both the electrical panel directory and on the fire alarm UDACT.

(ii) Install two telephone lines ahead of the PBX (from the telephone main terminal board) directly to the UDACT.

(iii) Provide a remote antenna in a secure location for the GSM communicator up to 100' away with wiring in conduit to maximize the signal strength for the communicator. Coordinate exact location with the Owner prior to rough-in.

(iv) The entire remote monitoring system will be installed in accordance with CAN/ULC-S561 "Installation and Services for Fire Signal Receiving Centres and Systems".

(v) The Design-Builder will coordinate with the Owner to set up an account with a remote ULC approved monitoring station. The Design-Builder will coordinate with the Owner to set up the cellular GSM telecommunications account for the UDACT.

(vi) The power supply will operate on 120 VAC, 60 Hz, and will provide all necessary power for the FACP.

(vii) It will provide 5.0 amps of usable Notification appliance power, using a switching 24 VDC regulator.

(viii) It will provide a battery charger for 24 hours of standby using dual-rate charging techniques for fast battery recharge.

(gg) The fire alarm control panel will provide dry contacts for shutdown, alarm, and trouble signals to the UDACT. The wire connections between the UDACT and the fire alarm control panel will be supervised.

(hh) The Design-Builder will provide Internet-Based Communications Link so the entire fire alarm system status can be monitored with password protection from a web browser through the internet. Coordinate with the Owner and obtain an IP address for the Owner wide area network. Provide a patch cord to the adjacent data outlet. Program the system to email the appropriate maintenance personnel in the event of any alarm or trouble condition showing detailed information of the event. Provide testing and commissioning of the internet communications through the Owner's network. Include all testing and Commissioning Reports in the O&M manuals.

(ii) Provide the following form C output contact for the DDC contractor to connect to:

(i) System in alarm; and

(ii) System in trouble.

(jj) Coordinate with DDC contractor to provide commissioning and testing of the fire alarm system interface with the DDC system for inclusion in the O&M manuals.

(kk) Waterflow Switches will be supplied and installed by the Design-Builder's mechanical contractor and wired as per manufacturer's instructions by the Design-Builder's electrical engineer.

(ll) Sprinkler and standpipe valve supervisory switches will be supplied and installed by the Design-Builder's mechanical contractor and wired as per manufacturer's instructions by the Design-Builder's electrical contractor.

(mm) All supervisory switches are to annunciate separately. Provide dedicated addressable modules.

(nn) Isolator modules will be provided to automatically isolate wire-to-wire short circuits on an SLC Class A or Class B branch. The isolator module will limit the number of modules or detectors that will be rendered inoperative by a short circuit fault on the SLC loop segment or branch. At least one isolator module will be provided for each floor or fire compartment of the building.

(oo) The isolator module will mount in a standard 4-inch (101.6 mm) deep electrical box or in a surface mounted backbox. It will provide a single LED that will flash to indicate that the isolator is operational and will illuminate steadily to indicate that a short circuit condition has been detected and isolated.

(pp) Conduit fill will not exceed 40 percent of interior cross sectional area where three or more cables are contained within a single conduit.

(qq) Cable must be separated from any open conductors of power, or Class 1 circuits, and will not be placed in any conduit, junction box or raceway containing these conductors.

(rr) Wiring for 24 volt control, alarm notification, emergency communication and similar power-limited auxiliary functions will be run in the same conduit as initiating and signaling line circuits. All circuits will be provided with surge protective devices and the system will be designed to permit simultaneous operation of all circuits without interference or loss of signals.

(ss) Conduits will not enter the fire alarm control panel, or any other remotely mounted control panel equipment or backboxes, except where conduit entry is specified by the FACP manufacturer.

(tt) The Design-Builder will provide and install spare conduit as required for future Building expansion.

(uu) Conduit will be 3/4 inch (19.1 mm) minimum.

(vv) All low tension and 120V for the fire alarm system wiring will be installed in conduit.

(ww) Wiring will be in accordance with local, provincial and federal standards. Number and size of conductors will be as recommended by the fire alarm system manufacturer, but not less than 18 AWG for initiating device circuits and signaling line circuits, and 14 AWG for notification circuits.

(xx) All wire and cable will be listed and/or approved by a recognized testing agency for use with a protective signaling system.

(yy) Wiring used for the multiplex communication loop will be twisted and shielded and support a minimum wiring distance of 10,000 feet (3,048 m). The system will support up to 3,000 ft. (914 m) of untwisted, unshielded wire (loop 1 only). The system will permit use of IDC and NAC wiring in the same conduit with the communication loop.

(zz) All field wiring will be completely supervised. Provide colour-coding and identify cable markers at all cable ends. Provide identification on wiring identify function as alarm zone or signal circuiting; i.e. alarm zone #3 = A3, etc.

(aaa) Wiring to door holders will be in a designated conduit system and will not contain other component wiring.

8.7.26 EV Charging

8.7.26.1 The Design-Builder will provide EV electrical distribution panel in weatherproof kiosk in the parking area as well as in the main electrical room with adequate capacity to support Level 2 EV charging in all required areas.

8.7.26.2 The Design-Builder will provide all infrastructure from the EV electrical distribution panel in main electrical room to EV charging stations in the following areas:

(a) minimum one Level 2 charging station in the main loading area with location to be confirmed in consultation with the Owner;

(b) minimum six Level 2 charging stations in the main parking area with locations to be confirmed in consultation with the Owner. No grouping more than two chargers per station/infrastructure will be allowed;

(c) infrastructure (conduit and space allowance for future distribution panels) for a minimum of four future Level 2 charging stations in the main parking area with locations to be confirmed in consultation with the Owner. No grouping more than two chargers per station/infrastructure will be allowed.

(d) EV charging stations shall include card reader connected to the building access control system, and shall engage the charger for a 2 hour period. Card reader shall be installed at closest entrance to the EV charging station and labelled. EV charger status shall be monitored by the BMS.

8.7.26.3 Infrastructure will be terminated in lockable box.

8.7.27 Renewable Energy

8.7.27.1 The Design-Builder will provide the following infrastructure to support the renewable energy systems:

(a) Provide all required electrical distribution, conduit, communications outlets, and other hardware to allow for a future solar photovoltaic system.

(b) Provide rough-in only for a photovoltaic system that will provide an annual energy production of greater than 95,000KWh/year. Future PV panel racking will be installed using aluminum clamps on the Metal Roofing on sloped roofs or a self-ballasted racking system on SBS near-flat roofs. No penetrations of the roofing assembly will be accepted.

(c) Not in use.

(d) Provide rough in for hybrid string inverters and power optimizers.

(e) Not in use.

(f) Not in use.

(g) Provide infrastructure to add a future weather station for data monitoring purposes. Final requirements to be confirmed with the Owner during the design development stage.

8.7.28 Operating and Maintenance Instruction

8.7.28.1 Requirements for Manuals

(a) The Design-Builder will provide a minimum of three copies of complete and approved operating and maintenance instructions for all electrical equipment and systems supplied before substantial completion. The Design-Builder will provide additional copies if required under the General Requirements. In addition, the Design-Builder will provide the Owner with a manual in a searchable PDF format on USB stick. As-Built Drawings to be included on the USB stick.

(b) Binders will be three-ring, hard-cover, loose-leaf type and identified on the binding edges as “Maintenance Instructions and Data Book.

(c) Terminology used in all the sections will be consistent.

(d) Volume one will contain the master index of all systems, the name of the subcontractor, electrical subcontractors and the date of substantial performance for the contract.

(e) Volume one will contain a section with all necessary warranty information.

(f) Each binder will have a complete index for all volumes.

(g) Each binder will be no more than half filled.

(h) There will be a separate section for all materials used on the project which fall under the WHMIS legislation. There will be an MSDS, hazard data sheet, for each of the materials.

(i) There will be a separate section for all Insurance Certificates, Test Certificates, Verification Forms and Test Forms.

(j) All relevant information relating to a system or product will be contained within one binder.

(k) The manual sections will follow the specification sections.

(l) Any diagrams, installation drawings, single line diagrams charts, etc. will be mechanically reduced while maintaining full legibility to standard page size. If this cannot be achieved they will be carefully folded and contained within a clear plastic wallet within the manual.

8.7.28.2 Data for Manuals

(a) Equipment data provided by the Design-Builder will contain:

(i) Operating instructions.

(ii) Operating conditions such as temperature and pressure.

(iii) Location of equipment.

(iv) Name and contact info of suppliers.

(v) Maintenance instructions and schedules for one year routine.

(vi) Recommended list of spare parts.

(vii) Maintenance schedule.

(viii) A trouble shooting table showing where to look for problems under various conditions of malfunction.

(ix) All wiring diagrams.

(x) Equipment operating curves.

(xi) Equipment nameplate data and serial numbers.

(b) System data will contain:

(i) A listing of all systems.

(ii) All panels, mechanical distribution panels, and fire alarm schedules and locations.

(iii) Equipment name tags.

(iv) Cleaning, maintaining and preserving instructions for all material, products and surfaces. Include warnings of harmful cleaning, maintaining and preserving practice.

(c) Additional manuals will be provided for:

(i) Switchboards and power distribution systems.

(ii) Lighting systems.

(iii) Emergency power systems.

(iv) Fire alarm systems.

(d) As-Built documentation will contain:

(i) Reviewed As-Built Shop Drawings.

(ii) As-Built Construction Drawings.

(iii) Originals of test forms.

(iv) Originals of test certificates.

8.7.28.3 Operating Instructions

(a) Instruct the Owner's Representative in all aspects of the operation and maintenance of systems and equipment.

(b) Instruct the Owner for a minimum of five working days.

(c) All instruction sessions to be video-taped and copy must be provided to the Owner and the Owner's Consultant.

(d) At the time of final review, the Design-Builder will provide a sheet for each system and piece of equipment showing the date instructions were given. Each sheet will show the duration of instruction, name of persons receiving instruction, other persons present (manufacturer's representative, Owner's Representative, etc.), system or equipment involved and signature of the Owner's Staff stating that they understood the system installation, operating and maintenance requirements. This information will be inserted in the manuals after all instructions have been completed.

(e) The Design-Builder will review all information with the Owner's Representative to ensure that all information required has been provided.

(f) Electrical equipment and systems to be included in the instruction requirements will include the following:

(i) Switchboards and related power distribution equipment.

(ii) Not in use

(iii) Automatic transfer switches.

(iv) Fire alarm systems.

8.7.28.4 Trial Usage

(a) The Owner will be permitted trial usage of systems or parts of systems for the purpose of testing and learning operational procedures. Trial usage will not affect the warranties nor be construed as acceptance, and no claim for damage will be made against the Owner for any injury or breakage to any part or parts due to the tests, where such injuries or breakage are caused by a weakness or inadequacy of parts, or by defective materials or workmanship of any kind.

8.7.29 Commissioning

8.7.29.1 General

(a) In accordance with ASHRAE Guideline 0, The Commissioning Process, the term commissioning will be taken in these specifications to mean a quality oriented process for achieving, verifying and documenting that the performance of Facility, systems, and assemblies meets defined objectives and criteria.

(b) The following systems will be commissioned:

(i) emergency lighting system;

(ii) fire alarm system;

(iii) structured cabling system;

(iv) cable television system;

(v) telephone system;

(vi) main distribution panel;

(vii) Not in use

(viii) SPD system;

(ix) lighting control system;

(x) security and access control system;

(xi) public address, clock;

(xii) sound systems; and

(xiii) CCTV system.

8.7.29.2 Products

(a) For each system, a separate report (a “Commissioning Report”) will be submitted. Each report will be in typewritten format and will clearly indicate each component and function tested and the corresponding test results for each test required by the specifications or by the Commissioning Agent. Prior to commissioning any system, the Design-Builder will submit the proposed report format to the Commissioning Agent for approval. Any test results submitted in a format not approved by the Commissioning Agent will be rejected at the discretion of the Commissioning Agent.

(b) Unless indicated otherwise, the above documents will be submitted digitally in PDF format. Word or Excel files are not acceptable. Scans are also not acceptable.

(c) Each report will indicate the name(s) of the personnel who performed the actual commissioning inspections and tests on site.

(d) Each report will include a cover letter, bearing the letterhead of the person commissioning the system (the “system commissioning agent”) and signed by an authorized staff member of the system commissioning agent, clearly stating for each system that it has been commissioned by the agent, that the results of the commissioning are documented in the attached Commissioning Report, and that, in the opinion of the system commissioning agent, the system is fully functional as intended. If for any reason, in the opinion of the system commissioning agent, the system is not fully functional, any and all deficiencies will be clearly identified in the letter and a timeline given for their correction.

8.7.29.3 Execution

(a) For each system and/or piece of equipment described below, a visual inspection will be made of all components to ensure a good operating condition. This requirement is separate from other Project Commissioning Plans and undertakings.

(b) For each system and/or piece of equipment described below: wherever deficiencies are observed, corrective measures will be taken. In the report, include a description of each deficiency and the corrective measure to be undertaken, including a schedule of dates for completion of the remedial work. Upon completion of the corrective measures, provide a subsequent written report to be added to the original submission.

(c) Record all tests and observations. Where no written record is made in the report, it will be assumed that no test or observation was made.

(d) Coordinate all electrical systems commissioning to ensure all systems meet the requirements.

(e) Emergency Lighting System

(i) The Design-Builder will cause the emergency lighting system installer to commission the emergency lighting system in coordination with the Commissioning Agent and the electrical contractor.

(ii) Each inverter, battery pack, emergency ballast, and exit sign will be tested to verify that it functions as intended under loss of power to the lights in the respective areas served by this equipment. Voltage readings are to be taken at each remote head and associated source. Using these readings, the voltage drop will be calculated at each remote head location, and will be expressed as a percentage of the source voltage. Any device locations for which the voltage drop is shown to exceed the tolerances of the applicable codes will necessitate the upgrading of wiring to those locations as required complying with code tolerances. Where wiring upgrades are made, test and verify again to ensure compliance. All costs associated with any remedial work will be borne by the Design-Builder only. No extras will be considered.

(iii) For each space in which emergency illumination is provided, the emergency lighting system commissioning agent will turn off the breakers for all circuits, and only for those circuits, that provide power to the luminaires in the respective space. If the emergency lighting equipment in question illuminates to its full brightness that equipment will receive a ‘pass’; if not, a ‘fail’.

(iv) The Commissioning Report for the interlock and operation of the emergency lighting systems will individually identify all equipment tested, including luminaire identification, location, breakers that were turned off, and test results. Any interlocks in on-compliance (fail) with proper operation as defined in the applicable electrical code will necessitate the replacement and retesting / verification, including the required remedial work, without additional costs to the Owner; no extras will be considered.

(f) Fire Alarm System

(i) The Design-Builder will engage the fire alarm system manufacturer to commission the fire alarm system in coordination with the Commissioning Agent and electrical contractor.

(ii) Each component of the fire alarm system will be tested in accordance with CAN/ULCS537-04 and CAN/ULCS1001.

(iii) The Commissioning Report will be formatted to the standard of CAN/ULC-S537-04 Appendix C.

(iv) A final fire alarm verification certificate must also be provided with the Commissioning Report.

(v) The Commissioning Report will indicate that, if applicable, the WAN connection and/or DDC connections have been tested and are working correctly.

(g) Structured Cabling System

(i) The Design-Builder will cause the structured cabling system installer to commission the structured cabling system in coordination with the Commissioning Agent and electrical contractor. The Design-Builder will ensure the installer is certified by the system manufacturer.

(ii) Each permanent link will be tested for all parameters necessary to verify conformance to the specified TIA system category and to the manufacturer's certification requirements.

(iii) The Commissioning Report will indicate each link tested, and for each will include the link identifier, location, minimum passing value for each parameter, and actual measured value.

(iv) The Commissioning Report will be submitted in both hard and soft copy formats.

(v) A 25 year warranty certificate is also be provided by the manufacturer and will be included in the Commissioning Report.

(h) Cable Television System

(i) The Design-Builder will cause the cable television system installer to commission the cable television system in coordination with the Commissioning Agent and electrical contractor. The Design-Builder will ensure the installer is certified by the system manufacturer.

(ii) The installer will align and balance the system in accordance with the manufacturer's recommendations.

(iii) Each subscriber drop will be tested for all parameters necessary to verify conformance to the manufacturer's recommendations.

(iv) The Commissioning Report will indicate each subscriber drop tested, and for each will include the drop identifier, location, minimum passing value for each parameter, and actual measured value. Parameters tested will include, but not be limited to distortion, signal uniformity, and signal to noise ratio. Final settings of the gain of each amplifier will be included.

(v) The Commissioning Report will be submitted in both hard and soft copy formats.

(i) Telephone System

(i) The Design-Builder will cause the telephone system installer to commission the telephone system in coordination with the Commissioning Agent and electrical contractor. The Design-Builder will ensure the installer is certified by the system manufacturer.

(ii) The installer will program all features and extensions to the requirements of the Owner.

(iii) Provide machine printed extension labels and listings for all phones.

(iv) The Commissioning Report will provide a description of each features and programming that has been installed for the system. The report will indicate that all features and programs for all phones have been tested and are working correctly.

(v) The Commissioning Report will be submitted in both hard and soft copy formats.

(j) Main Distribution Panel

(i) The Design-Builder will cause the main distribution panel (MDP) installer to commission the MDP in coordination with the Commissioning Agent and the electrical contractor.

(ii) Bus resistance will be measured and recorded.

(iii) Electrical and function tests will be performed to verify that all components and systems perform as intended. Such tests will include, but not be limited to the contact resistance of the main breaker, as well as its short, long, and ground fault delay pickup and delay time settings (where applicable), instantaneous pickup (where applicable), and a trip unit self-test.

(iv) Feeder terminations will be tested and voltage and amperage readings listed. Wherever readings do not comply with the tolerances of the applicable electrical code the Design-Builder will undertake remedial work, including, where necessary, replacement of connectors, fittings, and feeder wiring. Where replacements and/or other remedial work are required, test and verify again to ensure compliance. All costs associated with any remedial work will be borne by the Design-Builder only. No extras will be considered.

(v) Insulation resistance will be measured and recorded.

(vi) All digital meters will be commissioned and included as a separate section in the report. Indicate that all WAN connections and/or DDC connections have been tested and are working correctly.

(k) Surge Protective Devices (SPD)

(i) The Design-Builder will cause the SPD manufacturer to commission the SPD in coordination with the Commissioning Agent and the electrical contractor.

(ii) Electrical and function tests will be performed to verify that all components and systems perform as intended.

(iii) The Commissioning Report will indicate that the WAN connection and/or DDC connections have been tested and are working correctly.

(l) Low Voltage Lighting Control System

(i) The Design-Builder will cause the low voltage lighting control system manufacturer to commission the system in coordination with the Commissioning Agent, the installing contractor, the low voltage lighting control supplier, the controls contractor and the electrical contractor.

(ii) Electrical and function tests will be performed to verify that all components and systems perform as intended.

(iii) The commissioning process will include a test of any provisions in the control system for operation of emergency lighting.

(iv) The commissioning process will include a test of any provisions in the control system for operation of interfaces with alarm systems.

(v) Each lighting zone will be tested to ensure that it is controllable as intended. Where multiple points of control, (including switches, dimming controls, occupancy sensors, and daylight sensors) are provided for a given zone, each control will be tested. Controls that operate more than one zone will be tested for each zone.

(vi) Where the lighting control system includes dimming capability, each dimming control will be tested to ensure that each applicable zone dims as intended.

(vii) Where the lighting control system includes preset scenes, each instance of each preset scene will be tested to ensure that it functions as specified.

(viii) Where the lighting control system includes daylight sensors, the functionality of each sensor will be tested to ensure that it functions as specified.

(ix) The Design-Builder will cause the low voltage lighting control system manufacturer, Commissioning Agent and electrical contractor to provide on-site training to designated members of the Owner's maintenance Staff. Include a detailed description of the training given in the Commissioning Report.

(m) Security and Access Control System

(i) The Design-Builder will cause the security and access control system installer to commission the system in coordination with the Commissioning Agent and the electrical contractor.

(ii) Electrical and function tests will be performed to verify that all components and systems perform as intended.

(iii) The Commissioning Report will indicate that the WAN connection and/or DDC connections have been tested and are working correctly.

(n) Not Used

(o) PA, and Gymnasium Sound Systems

(i) The Design-Builder will cause the system manufacturers to commission the system in coordination with the Commissioning Agent and the electrical contractor.

(ii) Electrical and function testing will be undertaken to ensure the system components and operation meet the full intent of the documentation.

(iii) The Design-Builder will cause the manufacturer, Commissioning Agent and the electrical contractor to provide on-site training to designated members of the Owner's Staff. Include a detailed description of the training given in the Commissioning Report.

(p) CCTV System

(i) The Design-Builder will cause the CCTV system manufacturer to commission the system in coordination with the Commissioning Agent and the electrical contractor.

(ii) Electrical and function testing will be undertaken to ensure the system components and operation meet the full intent of the documentation.

(iii) The Design-Builder will cause the manufacturer, Commissioning Agent and the electrical contractor to provide on-site training to designated members of the Owner's Staff. Include a detailed description of the training given in the Commissioning Report.

(q) Demonstration of Complete Electrical Systems

(i) At completion of the project, check through all electrical systems with the Owner. This check to include instructing the Owner in operating and maintenance procedures. Allow for eight hours of on-site instruction after building occupancy at three separate times selected by the Owner.

(ii) Instructions will be carried out by the Design-Builder's electrical project superintendent or other senior official of the Design-Builder as approved by the Owner's Consultant.

(iii) Final demonstrations are to be recorded on video recordings with four copies provided with the Maintenance Manuals for reference by the Owner / user groups.

(r) Testing

(i) Test and check all portions of the electrical systems for satisfactory operation. All test results to be documented in the Operation and Maintenance Manuals.

(ii) Before energizing any portion of the electrical systems, perform Megger tests on all feeders. Space results to conform to the all applicable codes, to the satisfaction of the authorized inspection authority and the Owner. Megger tests on all feeder conductors to be done in the presence of the Owner and/or the Owner's Representative, suitably logged, tabulated, signed and included in the Operation and Maintenance Manuals.

(iii) Upon completion of building and immediately prior to final inspection and takeover, check load balance on all feeders at panelboards. Tests to be carried out by turning on all possible loads and checking load current balance. If load unbalance exceeds 15 per cent, reconfigure circuits to balance load. Readings to be logged, tabulated and incorporated into the Operation and Maintenance Manuals.

(iv) Take clip-on ammeter readings on all phases of all mechanical equipment motors with motors running under full load condition. Readings to be logged, tabulated and incorporated into the Operation and Maintenance Manuals.

8.7.30 Existing Gymnasium Integration

8.7.30.1 Provide permanent power, LAN, communications, fire alarm, intrusion, access control, and public address system connections from the main building. All services will be installed in conduit with spare capacity for additional future cabling requirements.

8.7.31 Childcare Space Integration

8.7.31.1 Provide power, communications, fire alarm, intrusion, access control, and public address system connections from the main building. All services will be installed in conduit with spare capacity for additional future cabling requirements. Allow for partitioning of systems to separate from School operation.

8.8 Division 27 - Communications

8.8.1 General

8.8.1.1 Appendix 1D - Systems Responsibility Matrix provides a summary of the party's responsibilities related to design and construction of the building systems.

8.8.1.2 The Design-Builder will provide conduit infrastructure from the street to the MTRs for CATV.

8.8.1.3 The Design-Builder will design the controls system as a BMS which allows monitoring and operation of the entire Facility from a single location or through a remote internet connection.

8.8.1.4 The Design-Builder will provide one Data Drop to each power distribution unit (PDU) to enable remote management and control via the Owner's LAN.

8.8.1.5 The Design-Builder will provide 4 lines from the main telephone backboard ahead of the PBX and 4-pair category 6A telephone cable in 25mm conduit to the fire alarm monitoring equipment, intrusion alarm monitoring equipment and elevator monitoring equipment for remote monitoring station tie-in.

8.8.1.6 Refer to electrical requirements in this Section (Div. 27) as well as all other applicable sections.

8.8.1.7 The conduits, pathways, room layouts, and design will comply with the TIA/EIA-569-C Commercial Building Standard for Telecommunications Pathway and Spaces, latest edition.

8.8.1.8 The Design-Builder will consult with the Owner and meet all of the Owner's policies and standards for all connections to the Owner's LAN, data, voice, audio, video and wireless networks.

8.8.1.9 The Design-Builder will comply with the clearance requirement and recommendations for all equipment and systems including TIA and BICSI.

8.8.1.10 The Design-Builder will coordinate with the Owner as it relates to the design and implementation of all IT and Telecommunications infrastructure defined within this section of the SOR.

8.8.1.11 Communications Rooms will be located away from wet areas and/or drainage pipes. The Design-Builder will provide water ingress mitigation measures for all Communications Rooms not only for flooding from outside the Facility but also from within the Facility.

8.8.2 Structured Cabling System

8.8.2.1 Basic Requirements

(a) The Design-Builder will provide and install a complete category 6 (CAT6) (unless noted otherwise, wireless infrastructure will be CAT6A) structured cabling solution throughout the Facility. Refer to Appendix 1B - Room Data Sheet for minimum number of Data Drops.

(b) The cabling infrastructure will be designed by a Registered Certified Data Designer (RCDD) and will be to the latest TIA/EIA standards including:

(i) TIA/EIA 569-C;

(ii) TIA/EIA 568-C.1, C.2 and C.3 Commercial Building Cabling Standards and Optical Fibre Cabling Standards;

(iii) 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;

(iv) TIA/EIA 606 Standard the Administration Standard for the Telecommunications Infrastructure of Commercial Buildings; and

(v) ANSI/TIA-607-D Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises.

(c) The structured cabling component will be of the same manufacturer and will be supplied and installed by a data subcontractor who is certified by the manufacturer's best available warranty/certification.

(d) The Design-Builder will provide 2 spare patch panel ports for each patch panel location. Spare ports are to be continuous starting after the last wired data port of the last / lower patch panel in the column.

(e) The Design-Builder will provide sufficient telecommunications outlets and outlet/connectors in rooms that have or are anticipated to have data, phone, video, or other end-use devices in consultation with the Owner during design development.

(f) The Design-Builder will provide data drops for all ancillary equipment as required by other trades such as for BMS panels, intrusion, CCTV systems.

8.8.2.2 Performance Requirements

(a) The Design-Builder will provide:

(i) A star wired cabling system to wire all telecommunication outlet locations back to Telecommunications Rooms and all Telecommunications Rooms back to the Main Telecommunications Room (School LAN).

(ii) Blank inserts for all unused cover plate openings.

(iii) Minimum of 2 category 6 (unless noted otherwise) cables fully terminated on RJ45's at each device location and will be run back to the TRs.

(iv) Maximum of 30% of the calculated cross-sectional area of the conduit pathway and maximum 25% fill of the tray including annular spacing between cables provided.

(v) Minimum, a 24 Strand OM5 Multi-Mode fiber from the MTRs to each TR and EF. Additionally, provide single mode fiber cables to EF. Additionally, provide 12 strand single mode fiber cables between the MTR (School LAN) and EF.

(vi) Spare capacity in TRs as per TIA/EIA 569-C Commercials Building Standard for Telecommunications Pathways and Spaces. All cabling will be run in conduit or cable tray. J- hooks will not be permitted.

(vii) Sufficient Data Drops for specialized systems.

(viii) Record drawings, operation and maintenance manuals and test results in accordance with the this Agreement.

(ix) Terminate all horizontal cabling on standard density RJ45 rack mounted rack mounted patch panels in MTRs and TRs. Follow TIA/EIA T568A Pin configuration. No horizontal cabling will be permitted to terminate on IDC block.

(x) Standard (flat) front patch panels with a maximum of 24 ports per panel. Patch panel terminations will be modular 8P8C jacks complying with ANSI/TIA-568-C.2 requirements for Category 6A.

(xi) Supply and install front mount wire management accessories to permit neat cross connect to systems equipment and rear mount cable management for maintaining minimum bend radii. Front management should be configured for 1U for each 1U of patch panels.

(xii) Sufficient quantity of patch cords for a complete and operational system. Confirm exact patch cord lengths with the Owner prior to placing order.

(xiii) Terminations for all fibre optic cables on rack mounted enclosure. Fibre optic cables will be terminated on both ends with LC type connector.

(xiv)

(xv) PDU rated for 20A at 120V, 1-phase and is furnished with 24 x 5-20 receptacles. will Acceptable manufacturer: Eaton Switched ePDU series, model no. PW102SW0U151.

(xvi)

(xvii) Provide one Data Drop to each PDU to enable remote management and control via the District LAN.

(xviii) Route all communications wiring by means of conduit and/or cable tray except where noted otherwise.

(xix) Install cable along or at right angles to building lines unless impracticable to do so. Verify specific cases of deviation in advance with the Owner's Representative.

(xx) Size boxes and housings to accommodate cable population and minimum bending radii as listed in the EIA/TIA 569-B.

(xxi) All cables will be installed free from defects, including kinks and excessively tight bends.

(xxii) Do not exceed manufacturer's recommended maximum pulling force.

(xxiii) Where overhead distribution is used, provide 1m of excess cable in the accessible ceiling space above each communications outlet.

(xxiv) Secure cables neatly into logically grouped bundles using Velcro strapping for all category rated cables.

(xxv) Cables will be installed as per the following minimum requirements:

1. 6" (127 mm) from power lines feeding loads no greater than 2 KVA.
2. 12" (300 mm) from power lines feeding loads between 2 and 5 KVA.
3. 24" (610 mm) from power lines feeding loads greater than 5 KVA.
4. 12" (300 mm) from light fixtures.
5. 48" (1220mm) from distribution transformers.
6. Where cables and/or power lines are installed in conduits, a nearer proximity is permitted. Refer to the BICSI Telecommunication Distribution Methods Manual, Eleventh Edition, or consult with the engineer of record.

(xxvi) Unless noted otherwise, in this section the term "cabling space" will mean the readily accessible space above an accessible ceiling.

(b) Acceptable manufacturers: CommScope Systimax, Siemens, AMP NETCONNECT, Belden, Leviton, Panduit.

8.8.3 Telecommunications Racks and Cabinets

8.8.3.1 The Design-Builder will:

(a) Provide all racks and cabinets as necessary for the Facility, except where specified otherwise in this Schedule.

(b) Provide minimum 20% spare capacity for expansion.

(c) Locate all cabinets with proper clearance, one meter on three sides.

(d) Provide racks that are heavy duty enclosures, 48U, 750mm wide, minimum 1070mm deep, gangable with lockable perforated doors.

8.8.3.2 The Design-Builder will provide the following for each rack:

(a) Two dedicated 20A receptacles mounted at bottom of frame.

(b) Two vertical power distribution unit bars mounted to the frame.

(c) Empty bottom 1/3 of the rack. Racks will only be filled in the top 2/3 of the rack.

(d) Bonding Lug.

(e) Hinged channels for vertical patch cord management and on relay frames on either side from top to bottom (no horizontal cables will be installed in the channel.) Where relay racks are to be ganged together, provide a minimum 6” wide hinged trough in between racks.

(f) Horizontal cable managers fabricated from steel, with standard 19” rack mounting, 1 RU in height and 4 D-rings each ring at 76mm x 89mm (3"x3.5").

(g) Horizontal cable managers placed above and below each patch panel.

(h) One additional horizontal cable manager for every patch panel installed.

8.8.3.3 Approved Manufacturer: APC NetShelter SX series, Hammond Manufacturing H1 Series or acceptable equivalent.

8.8.3.4 Rack elevation layout will use the following scheme: patch panel, horizontal cable manager, edge switch, horizontal cable manager, patch panel, horizontal cable manager, edge switch, horizontal cable manager and so on. Further confirmation required in consultation with the Owner during design development.

8.8.3.5 Support of cabinets by conduit, pipes, ducts, wire or any other non-structural component is not acceptable.

8.8.4 Communications Rooms

8.8.4.1 Entrance Facility

(a) The Design-Builder will provide an EF in the Facility that will accommodate the following:

(i) the demarcation of the incoming telecommunications service;

(ii) minimum of two 104mm (4”) service ducts into the EF for the utility service box;

(iii) telephone;

(iv) local area network; and

(v) CATV.

(b) The EF will be designed in accordance with the TIA/EIA-569-C Standard.

8.8.4.2 Main Telecommunications Room (School LAN)

(a) The Design-Builder will provide an MTR (School LAN) in the Facility that will accommodate the following:

(i) core network switches that will be connected to each TR;

(ii) edge switches;

(iii) servers;

(iv) space for minimum four racks, three will be provided by the Design-Builder;

(v) minimum one metre clearance between wall mounted equipment and front, back and one side of rack rows;

(vi) 19 mm (3/4") GIS birch or fir plywood backboard, painted with two coats of fire retardant white paint, on all MTR (School LAN) walls; and connection to generator as well as normal power.

8.8.4.3 Telecommunications Room

(a) The Design-Builder will provide at least one Telecommunications Room per floor. The Design-Builder will provide additional TRs where required to comply to the 90 metre horizontal cabling limitation.

(b) The Design-Builder will ensure each TR only serves the floor they are on and placed to maximize the area they serve.

(c) The Design-Builder will ensure the maximum cable distance from telecommunication outlet to TR patch panel termination is 90 metres.

(d) The Design-Builder will provide TR(s) in the Facility that will accommodate the following:

(i) edge switches;

(ii) space for minimum two racks, one will be provided by the Design-Builder;

(iii) minimum one metre clearance between wall mounted equipment and front, back and one side of rack rows;

(iv) 19 mm (3/4") G1S birch or fir plywood backboard, painted with two coats of fire retardant white paint, on all Telecommunications Room walls; and

(v) connection to UPS as well as normal power.

8.8.4.4 The Design-Builder will ensure each TR only serves the floor it is on and placed to maximize the area it serves.

8.8.4.5 The Design-Builder will ensure the maximum cable distance from telecommunication outlet to TR patch panel termination is ninety 90 metres.

8.8.4.6 The Design-Builder will provide terminations for the following in rack mounted patch panels:

(a) backbone fibre; and

(b) horizontal copper cabling.

8.8.4.7 The Design-Builder will provide patch cords in sufficient quantity, based on the LAN design and approval, plus 10% spare.

8.8.4.8 Quantity of patch cords provided by the Design-Builder will be at least two patch cables per port/outlet. One of which will be 12” short patch cable used in the TR.

8.8.4.9 The Design-Builder will ensure 1.5 metre, black patch cord and end use device cables are dressed and concealed, to standard approved by the Owner.

8.8.5 Redundancy of Pathways and Spaces

8.8.5.1 The Design-Builder will provide a cable tray for telecommunications and public address cabling throughout the building in areas with accessible ceilings.

8.8.5.2 The cable tray design will adhere to the following:

(a) minimum 300 mm wide by 100 mm deep in hallways and TRs;

(b) separate telecommunications and public address cabling using cable tray barrier;

(c) basket type aluminum;

(d) sized for cable density plus future expansion based on TIA/EIA standards;

(e) install cable tray with clearances for easy addition or removal of cables and in compliance with all codes and regulations;

(f) remove any sharp edges, points or burrs;

(g) provide cable tray firestop fittings at each firestop penetration. Fittings will be sized to accommodate a 25% increase in cable capacity; and

(h) install seismic restraints for the cable tray according to ECABC Seismic Restraint Manual and the Design-Builder’s seismic restraint engineer.

8.8.5.3 The Design-Builder will provide a zone conduit system in areas where cable tray is not feasible.

8.8.6 Fibre Backbone

8.8.6.1 Data fibre backbone cabling will be 24 strand OM5, 50/125 micron multimode fibre optic cable between the MTRs, each TR and EF. Additionally, provide 12 strand single mode fiber cable between the MTR (School LAN) and EF.

8.8.7 Copper Backbone

8.8.7.1 The Design-Builder will provide copper backbone consisting of 5 cables of balanced twisted pair, 23 AWG solid copper, Plenum Rated FT-6/CMP or Riser Rated FT-4/CMR (as required by local codes) cable meeting all Category 6A transmission characteristics of ANSI/TIA/EIA-568-C.2 for data and voice backbone. If copper backbone distance exceeds 90 m, provide fibre backbone instead of copper backbone.

8.8.7.2 Where copper cabling is used, no cables will be used with greater than 25 pairs.

8.8.8 Horizontal Cable

8.8.8.1 The Design-Builder will provide 4-pair Category 6 Data Drop (unless noted otherwise), 24 AWG and 100 ohm.

8.8.8.2 The Design-Builder will provide horizontal cabling to connect telecommunications outlets/equipment with direct connect terminations back to the TR.

8.8.8.3 Horizontal cabling will not exceed 90m in length and be continuous without any splices. Maximum channel-length will not exceed 100m.

8.8.9 Bonding

8.8.9.1 The Design-Builder will provide a ground bus bar and appropriate bonding in each TR as per ANSI/TIA-607 and the following requirements:

(a) Bond patch panel equipment rack to nearest telecommunications ground bus using an unbroken run from the rack to the bus.

(b) For each telecommunications grounding busbar (TGB), provide bonding connection to the ground terminal of the nearest AC electrical panelboard.

(c) In buildings of non-combustible construction: In addition to the bonding connection to the nearest AC panel, provide a bonding connection to the nearest structural steel member.

(d) For distances not exceeding 100 ft., use minimum #6 AWG copper wire for the telecommunications bond. For longer distances, consult with the Owner's Representative.

8.8.10 Telecommunications Outlets

8.8.10.1 Basic Requirements

(a) Refer to Appendix 1B - Room Data Sheets and Appendix 1D - Systems Responsibility Matrix for system's scope.

(b) The Design-Builder will provide one duplex receptacle adjacent to every data port except in Telecommunications Rooms, Wireless Access Point locations, and telephone locations.

8.8.10.2 Performance Requirements

(a) The Design-Builder will provide sufficient telecommunications outlets that comply with the following:

(i) outlets will be as per T568A Wire Map configuration, with modular 8P8C jacks;

(ii) voice jacks will be white;

(iii) data jacks will be blue;

(iv) outlet plates will be single gang;

(v) outlet coverplates for wall mounted telephone handset jacks will be stainless steel complete with steel mounting studs; and

(vi) coverplates will be suitable for handsets to be installed.

8.8.11 Uninterruptable Power Supply (UPS)

8.8.11.1 The Design-Builder will provide space in the network rack for the Owner supplied UPS uninterruptable power to Telecommunications Rooms, and spaces designated by the Owner in N+1 configuration.

8.8.12 Wireless Infrastructure

8.8.12.1 Basic Requirements

(a) Refer to Appendix 1D - Systems Responsibility Matrix for system's scope and responsibility.

(b) Wireless infrastructure will meet or exceed the latest industry standards including the latest editions of the following standards:

(i) ANSI/TIA/EIA-568-C.0, Generic Telecommunications Cabling for Customer Premises;

(ii) ANSI/TIA/EIA-568-C.1, Commercial Building Telecommunications Cabling Standard;

(iii) ANSI/TIA/EIA-568-C.2, Balanced Twisted Pair Telecommunications Cabling and Components;

(iv) ANSI/J-STD-607-A-2002, Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications;

(v) BICSI Telecommunications Distribution Methods Manual, Eleventh Edition;

(vi) ANSI/TIA/EIA-569-B, Commercial Building Standard for Telecommunications Pathways and Spaces;

(vii) ANSI/TIA/EIA-606-A, Administration Standard for Commercial Telecommunications Infrastructure; and

(viii) IEEE 802.11 Telecommunications and information exchange between systems local and metropolitan area networks.

(c) The Design-Builder will provide a complete wireless network infrastructure (Conduit, Cat6 cabling, outlets) throughout the Facility, at least one in each teaching space. Refer to Room Data Sheets for minimum locations.

(d) The Design-Builder will provide structured cabling to connect the wireless access points to the local TRs.

8.8.12.2 Performance Requirements

(a) The Owner will provide PoE switches as required.. Exact specifications and model will be provided at the time of procurement.

(b) Provide record drawings and operation and maintenance manuals in accordance with the Design-Build Agreement.

(c) The Owner will supply wireless access points for installation by the Contractor.

8.8.13 Network Equipment

8.8.13.1 Basic Requirements

(a) Refer to Appendix 1D - Systems Responsibility Matrix for system's scope and responsibility.

(b) The Owner will provide all active equipment for the Facility LAN including firewall, core and edge switches.

(c) The Design-Builder will provide all infrastructure to support the Facility LAN.

8.8.14 Audio Visual Systems

8.8.14.1 The Design-Builder will provide and install conduit, outlet boxes, wiring and equipment as well as provide testing and commissioning for the complete audio visual systems throughout the Facility.

8.8.14.2 Audio visual systems will be provided in the following areas:

(a) Gymnasium;

(b) Multi-Purpose Space;

(c) Drama classroom / Black box theatre;

(d) Not in use

(e) Meeting rooms;

(f) Studios (science labs);

(g) Common areas;

(h) High Tech Boardroom;

(i) Indigenous space;

(j) Not In Use

8.8.14.3 The Design-Builder will provide the following equipment in each space requiring Audio Visual (AV) systems:

(a) Power for the television(s).

(b) Power for media control device.

(c) Data Drop for media control device.

(d) Media control equipment.

(e) Allow for wall mounted infrastructure, away from doors at height for comfortable viewing based on room design, dimensions, and site line analysis.

(f) Provide a minimum four ceiling mount speakers for video and AV presentations and speech reinforcement for all learning spaces. Exact quantity to be determined in consultation with the Owner and to suit the room size and configuration:

8.8.14.4 Infrastructure Requirements:

(a) All AV cabling will be in conduits. Conduits will be in walls, ceilings and floors and will not be visible;

(b) Recessed television media boxes shall be minimum 400mmx400mm complete with receptacle and require data and AV outlets, HDMI.

(c) All power and communications cabling and outlets will be provided to support the AV systems; and

(d) No wiring will be visible.

8.8.14.5 The AV system will include all head-end including amp-mixer and speakers. Acceptable manufacturers: Bogen, Community, Crestron, TOA or acceptable equivalent.

8.8.14.6 Provide adequate receptacles where required to suit system functionality

8.8.14.7 Refer to Appendix 1B - Room Data Sheets for additional room requirements.

8.8.14.8 The Design-Builder will a provide wireless microphone as part of the AV system for the Gymnasium Activity Space, the Multi-Purpose Space, the Learning Commons, the Indigenous space.

8.8.14.9 Gymnasium audio system shall include sub woofers and speakers/monitors adequately sized for the spaces served. AV rack in each gymnasium shall include all required amplifiers and media interface equipment.

8.8.14.10 Televisions shall be minimum 85”, 4K UHD 120Hz smart capable complete with minimum 3 HDMI ports.

8.8.14.11 Gymnasium video wall(s) shall be minimum 5000 mm diagonal dimension with maximum 4mm pitch, 1200 nits brightness, wide viewing angle and rugged enough for gymnasium installation. Shot clocks shall be provided for all courts in both gymnasiums and shall be 600mmx450mm video panel sections with specification matching the main wall. Provide complete content control and management software, manual scoreclock controller and outlets at the score table location for proper operation. System shall be capable of individual feeds per main screen and used for scoreclock and other media applications. System shall be networked and have the ability for HDMI connection. System shall manufacturer shall be equal to OES.

8.8.14.12 AV system will use the structured cabling system and will be integrated with the Owner's LAN.

8.8.14.13 The Design-Builder will provide audio DSP (digital signal processor) to process audio signals. Employ echo cancellation on all microphone inputs.

8.8.14.14 The Design-Builder will meet with the Owner to determine exact specifications of equipment, room configuration, set up, and commissioning.

8.8.14.15 The Design-Builder will provide training for Facility staff of all AV equipment.

8.8.14.16 Unless otherwise specified by the Owner, the training will commence at least one month prior to completion and completed and minimum two time periods to accommodate staff schedules.

8.8.15 Theatre Sound System

8.8.15.1 Design performance sound reinforcement system as part of the theatre design.

8.8.15.2 Minimum system requirements:

(a) 24 channel digital mixer, with USB recording capability in sound booth.

(b) Digital signal processing, including equalization, compression, and feedback prevention.

Pre-programmed settings accessed from locked control on stage to provide basic functionality without access to mixing console.

24 input points on stage, connected to sound booth.

Final requirements and locations will be confirmed in consultation with the Owner during the design development.

8.8.16 Integration Requirements

8.8.16.1 The Design-Builder will:

(a) design, procure, install, commission and integrate network architectures and telecommunication, security, and other Facility systems in accordance with Appendix 1D - Systems Responsibility Matrix; and

(b) coordinate the design of such architecture and systems, including functionality, with the Owner's IT representatives.

8.8.16.2 Telephone Equipment

8.8.16.3 Basic Requirements

(a) Refer to Appendix 1B – Room Data Sheets for locations where telephone connectivity is required.

(b) Refer to Appendix 1D – Systems Responsibility Matrix for system's scope and responsibility.

(c) The Design-Builder will provide dedicated UPS.

(d) Telephones will be VoIP, with equipment supplied by the Owner. The Design-Builder will confirm with the Owner prior to procurement for the exact specification of the Owner supplied system and the configuration. The Design-Builder will provide all necessary infrastructure including wiring to make the system fully operational.

8.8.16.4 Performance Requirements

(a) The telephone system will be on UPS with enough capacity to operate the entire system for 30 minutes.

(b) The Design-Builder will provide integration and interfacing with the PA system to permit paging from administrative telephones through the PA system.

(c) Field Quality Control

(i) Make observations to verify that units and controls are properly labeled, and interconnecting wires and terminals are identified.

(ii) Testing: thoroughly test system to verify that all system features are fully operational.

(d) The Owner will provide complete attendant and telephone user training as required to provide a successful operating system.

(e) Provide warranty and service during the Warranty Period. All parts and labour to be provided at no charge. Provide same day service for regular service if call has been entered during the morning of the working day. Provide an emergency service call response of within two hours for a major system breakdown or a total system failure.

(f) The Design-Builder will provide all the necessary telephone interface modules and paging zone modules to integrate with the PA system.

(g) The incoming telephone service will be ordered by the Owner. The physical conduits and duct banks from the utility service to the Entrance Facility are to be provided by the Design-Builder.

(h) The Design-Builder will provide record drawings and operation and maintenance manuals in accordance with this Agreement.

8.8.17 Public Address (PA)

8.8.17.1 Basic Requirements

(a) Refer to Appendix 1D - Systems Responsibility Matrix for system's scope and responsibility.

(b) The Design-Builder will provide and install all equipment to provide a fully operational public address system for the Building including:

(i) ceiling/wall mounted speaker assemblies;

(ii) paging horns;

(iii) call initiation switches;

(iv) built in master clock;

(v) amplifiers;

(vi) power supplies;

(vii) volume attenuators;

(viii) terminal equipment;

(ix) wiring;

(x) program sources; and

(xi) equipment racks and cabinets.

(c) It will be possible to readily connect the system to the PSTN (Public Switched Telephone Network) by connecting it to analog CO trunks.

(d) The public address system will allow the user to select any room to play isolated and room-specific announcements.

(e) The Design-Builder will integrate the PA system with the Owner's supplied VoIP telephone system. The Design-Builder will coordinate with the Owner during the design and provide all PA system components required for a fully integrated and functional system.

8.8.17.2 Performance Requirements

(a) The Design-Builder will comply with the following:

(i) field wiring will be terminated on wall adjacent to rack using Telco 66 type blocks with labelling to indicate final architectural room number;

(ii) provide one zone along each building elevation;

(iii) provide separate paging zones for common area speakers on different floors;

(iv) each classroom/instructional space will be individually zoned;

(v) provide public address in every occupiable room and space except for the Quiet Room and Sensory Rooms. Main electrical, mechanical and Communications Rooms will be provided with a public address system;

(vi) all hallway speakers will be tapped at 1 watt maximum;

(vii) all classrooms speakers will be tapped at ½ watt maximum;

(viii) all outside horns will be tapped at 7.5 watts maximum;

(ix) large rooms will be tapped at 2 watts maximum;

(x) all major components will be fully pluggable by means of multi-pin receptacles and matching plugs to provide for ease of maintenance and service;

(xi) cables within terminal cabinets, equipment racks will be grouped and bundled as to type and laced with No. 12 cord waxed linen lacing twine or T&B “Ty-Rap” cable. Edge protection material will be installed on edges of holes, lips of ducts or any other point where cables or harnesses cross metallic edge;

(xii) cable conductors will be colour-coded and individual cables will be individually identified;

(xiii) cable shielding will permit connection to common ground at point of lowest audio level and will be free from ground at any other point;

(xiv) cable shields will be terminated in the same manner as conductors;

(xv) the cable shields will be grounded at the equipment end and insulated at the speaker end. Use heat shrink for insulation at speakers;

(xvi) the Design-Builder will provide all necessary surge protection on the AC power feed and on all station lines leaving or entering the building;

(xvii) install equipment in accordance with manufacturer’s written instructions;

(xviii) it is only acceptable to run exposed low-voltage wiring above readily accessible, continuous ceiling areas;

(xix) ground equipment, conductor, and cable shields to eliminate shock hazard and to minimize to the greatest extent possible, ground loops, common mode returns, noise pickup, cross talk, and other impairments. Measure, record, and report ground resistance;

(xx) the Design-Builder will mount a main distribution frame behind the Integrated Electronic Communications Network console. All wires will be laid down on terminal punch blocks and identified by the actual room location served. All the communications points will be wired into this main distribution frame, laid down in sequence, and identified by which line it is on and the point position it serves. The terminal punch blocks and wiring will not be accessible without tools;

(xxi) except where specifically noted otherwise, all equipment supplied will be the standard product of a single manufacturer of known reputation and minimum of 10 years' experience in the industry. The supplying contractor will have attended the manufacturer's installation and service school. A certificate of this training will be provided with the Design-Builder's submittal; and

(b) Acceptable product: Carehawk CH1000.

(c) Refer to Appendix 1B - Room Data Sheets for locations requiring PA.

8.9 Division 28 – Electrical Safety & Security

8.9.1 Intrusion Detection

8.9.1.1 Basic Requirements

(a) Appendix 1D - Systems Responsibility Matrix provides a summary of the party's responsibilities related to design and construction of the building systems.

(b) The intrusion alarm system will be designed, supplied, installed, and commissioned by the Design-Builder.

(c) Electrical/security locking requirements to be confirmed with the Owner during design development. The intrusion alarm system will consist of a control panel, Passive Infrared Detectors (PIR), magnetic door alarm switches, programming keypads, and interior sirens.

(d) Intrusion detection systems will be installed in all areas where protection of physical assets is critical.

8.9.1.2 Performance Requirements

(a) The intrusion detection system will utilize Passive Infrared Detectors (PIR) to monitor activity. PIR's will be wall mounted on 4" x 4" outlet box complete with single gang mud ring.

(b) PIR's will be ceiling mounted dual element motion detectors complete with mounting. Acceptable Product: DSC-BV300DP complete with tamper and wire guards or acceptable equivalent.

(c) Gym motion detection units to be DSC-BV300DP complete with tampers and wire guards or acceptable equivalent.

(d) All PIR's will be field adjusted as per manufacturer's specs.

(e) All PIR's will have the LED's disabled after the initial testing is done.

(f) All perimeter doors require double door contacts.

(g) The Design-Builder will provide all devices, wiring and pathways.

(h) Magnetic door switches will be flush mounted in door frames and will be supervised by the Main Control Panel. Switches will be supervised and individually wired to terminal cabinet. Door switches to be Sentrol 1078 or acceptable equivalent.

(i) Sirens will be DSC 3015 or acceptable equivalent. These will be installed complete with siren drive and separate power supply. Install sirens in all interior building areas as required to provide suitable coverage. (Audible siren will be easily heard at all exterior entrances from outside the building).

(j) Wire and cable will comply with the following requirements:

(i) 6C#22 AWG “Z” stranded cable FT4 rated for all powered detection devices and 4C #22 AWG “Z” cable to all door contacts.

(ii) 2C#18 AWG stranded cable, FT4 rated for sirens.

(k) PIR’s will be installed in all ground floor perimeter rooms, and all hallways.

(l) Glass breaks will be installed as required by CPTED and on all perimeter glazing below 4000mm from grade. Acceptable Product: CK 1625T complete with tamper or acceptable equivalent.

(m) The intrusion detection system will be armed and disarmed by keypads. Keypads are to be provided at a minimum one in the main office, MTRs, MER, Gym, entrances, exits, near main entrance and as per the Room Data Sheets. Provide one keypad next to alarm panel.

(n) Acceptable keypad product: Maxsys LCD4501 complete with LCD display or acceptable equivalent.

(o) All keypads except for the main control panel keypad will have arming/disarming and programming capability turned off via programming and will only be used for system status display.

(p) The intrusion alarm panel will be provided and installed adjacent to the fire alarm panel in the electrical room. The alarm panel will be powered by a dedicated 120V, 15A circuit and be provided with batteries and UPS power. The alarm panel will be enclosed in a BEL Products K Series, K201608, or acceptable equivalent, enclosure. A telecommunications outlet will be provided adjacent to the alarm panel for monitoring purposes.

(q) The security alarm control panel will be Bosch B520 Series, CPU complete with additional B208 SD12 expansion modules for required zones and digital communicator for remote monitoring.

(r) The Design-Builder will be responsible for all programming.

(s) The Owner will supply all access codes and phone numbers to be programmed into the alarm system.

(t) The panel will be programmed in the standard CID (contact id) format.

(u) The Design-Builder will program the following:

(i) user code to bypass zones as well as installer codes, and user codes provided by the Owner;

(ii) periodic test transmission daily; and

(iii) bell restore after 4 minutes.

(v) The Design-Builder will not install a contractor's lockout enabler and will not program the following without prior approval from the Owner:

(i) forced arming;

(ii) auto-arming; and

(iii) auto-disarming.

(w) The Design-Builder will not access the system either physically or remotely without Owner's approval.

(x) The intrusion alarm system will report independently from the fire alarm system.

(y) Telephone line will be used for the primary monitoring method. Provide a GSM radio model GSM 3060 for back-up.

(z) Provide programming for up to eight partitions. Coordinate required partitioning with the Owner.

(i) Partitioning will typically involve establishing one partition consisting of the General Office, Learning Commons and Computer room operated by one reader located outside the General Office. One partition will include the remainder of the building in a secondary school application. A site may include one partition shared by both the gym and public use areas served by a distinct entry (if separated by corridor doors).

(aa) Triad DCPC 4204 power supply and 16 volt, 37 VA ATCFT3716 transformer.

(bb) The panel power supply will be a minimum 37 VA. It will be hard wired to a dedicated, non-switched source (i.e.no plug-in type transformers) and the circuit number be clearly identified on both the electrical panel directory and on the alarm panel.

(cc) Provide the following form C contact points for the DDC contractor to connect to:

(i) System armed (DDC system to sweep off all lights controlled by the low voltage lighting system 15 minutes after arming). Provide 7 points to monitor 7 partitions.

(ii) System disarmed (DDC system to turn on corridor lights). Provide 7 points to monitor 7 partitions.

(iii) System in alarm (DDC system to turn on all interior and exterior lights controlled by the low voltage lighting system). Provide 7 points to monitor 7 partitions.

(iv) Provide one point for School lockdown alarm.

(v) Provide one point for monitoring intrusion alarm system trouble.

(dd) All field device wiring will home run in conduit to a splitter box (24” x 6" x 4") located above the alarm panel enclosure. Daisy chains are not permitted. Adequate 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. Provide additional alarm panels if required to suit layout.

(ee) Provide record drawings and operation and maintenance manuals in accordance with this Agreement.

(ff) The Design-Builder will install the intrusion alarm system according to the following requirements:

(i) Install main control panel in the main electrical room and connect to UPS supplied ac power supply, and provide dc standby power. Coordinate for provision, and placing into service, of associated telephone line for remote monitoring and WAN connectivity.

(ii) Install proximity readers with remote system status LED indicators as shown on the drawings. Status LED’s will be clearly visible through the glazing adjacent to the main entry doors to each module. Wire the proximity readers with 6C #22 shielded stranded cable. Status LED indicators will be LCD display keypads.

(iii) Wire the keypads with 4C#22.

(iv) Install door switches only on doors where other methods of protection are not feasible or practical or would be subject to damage or vandalism. Where installed, provide and coordinate rough-in with the Design-Builder to ensure rough-in scheduling is coordinated with wall and door frame construction and installation. Door switches will be flush mounted in door frames and will be supervised by the main control panel. Wire door switches with 4C #22 shielded stranded cable. Red and black wires are twisted together for a tamper loop.

(v) Passive infra-red detection units will be ceiling or wall mounted and adjusted on site as recommended by the manufacturer and system installer. All P.I.R. units are to be individually wired to the terminal boards. Leave 6 m of slack cable at each detector location to permit adjustment of location. Manufacturer and installer to review and advise on each device location prior to final installation. Wire passive infrared detection units with 6C#22 shielded stranded cable and installation height should be at minimum 2250 mm.

(vi) All system devices will be individually wired to the control panel in minimum 20mm EMT conduit.

(vii) Terminate all wiring on BIX blocks. No compression splices are to be used.

(viii) Security system circuit boards are to be installed in the minimum number of cabinets. Provide large cabinets for boards and terminations. The area will have sufficient room to allow the equipment required to expand the final security system by 30%. Shop drawings will include a scaled cad layout drawing of the interior of the cabinet showing cabinet dimensions, equipment locations, cable runs and cable management. Show equipment catalogue numbers on drawing.

(ix) Allow for complete system programming of the system to meet the Owner's requirements.

(x) Test each device to ensure correct operation and that wiring is properly supervised.

(xi) Ensure devices (zones) are shown correctly on control panel and all annunciation devices.

(xii) Provide certificate of installation and acceptance to the Owner upon completion.

8.9.2 Access Control

8.9.2.1 Basic Requirements

(a) The access control system will be designed, supplied, installed, and commissioned by the Design-Builder.

(b) The Design-Builder will comply with the latest version of the BCBC.

(c) The Design-Builder will coordinate with Division 8 Openings to ensure hardware is compatible and meets the requirements.

(d) The access control system will be compatible with desktop computer and mobile applications on an iPhone/iPad.

8.9.2.2 Performance Requirements

(a) Electrical/security locking requirements to be confirmed with the Owner during design development. The Design-Builder will provide the following system:

(i) The system must be compatible with the Owner's current standards. Acceptable manufacturer: Avigilon ACM series complete with AC-LSP power supplies, AC-MER door controllers, Kantech KET-SG-MT card readers and all required auxiliary equipment for a complete system.

(ii) RS-485 cable connection will not be permitted.

(iii) Interconnection to security alarm control panel.

(iv) Power supply similar to security alarm control panel.

(v) Individually zoned and annunciated system devices.

(vi) Programmable control panels via the remote monitoring station's software or the system alpha-numeric keypad.

(vii) Arming and disarming of the systems will be provided at the proximity reader keyfob access stations located throughout the building and the main intrusion keypads. Each event will be monitored at the remote station for logging.

(viii) System installation and programming to disarm the intrusion alarm system and enter as follows:

1. Touch the keyfob to the reader;
2. Door will release and remain unlocked for 8 seconds; and
3. If the door remains closed, the alarm will not be disarmed.

(ix) Provide programming system status to the Owner's requirements. Programming must be completed by manufacturer's certified installers. A manufacturer issued certificate will be verified prior to start of programming t ongoing support from the manufacturer's representatives.

(x) A connection from the door access control system to the fire alarm system to allow the Owner to optionally release all electric door locking devices. Install connection to fire alarm system and get confirmation in writing from the Owner if the option is to be activated or not. Demonstrate to the Owner that the option has been installed, commissioned and works correctly when activated.

(xi) Operation of any alarm initiating device to:

1. Cause interior and exterior sirens to operate;
2. Transmit signal to remote monitoring station;
3. Display zone and alarm device on keypad display; and
4. Display steady red and green at all system status LED's.

(xii) The system status LED's on keypad display will display as follows:

1. Multi partition system will have displays indicating:
   a. "R" for Ready;
   b. "A" for Armed; and
   c. "N" for Not ready.
2. LED's on proximity readers will have displays indicating:
   a. Readers outside
      i) Remain red and are only green temporarily as access is granted.
   b. Readers inside
      i) System unarmed "Green";
      ii) System armed "Red"; and
      iii) System in alarm "Red Green".

(xiii) The system will be equipped, tested and commissioned for monitoring by the Owner's designated monitoring agency.

(b) The Design-Builder will provide power and data connections for Maintenance PC for remote access to BMS panel.

(c) The Design-Builder will provide power connections to all roll shutters, blinds, and blackout curtains as per Appendix 1B - Room Data Sheets.

(d) Not used.

(e) The Design-Builder will program the access control system to turn on or turn off the security alarm system based on which proximity card reader is being activated. Coordinate all programming with the Owner.

(f) The Design-Builder will coordinate door strikes with door hardware installer as early as possible to ensure a coordinated system. No extra costs will be considered for failure to coordinate door strikes with the door hardware installer.

(g) The Design-Builder will provide full-length, bended astragals on fire exits leading to outside. These doors to be “exit” only.

(h) The Design-Builder will provide card readers or electronic access:

(i) at all doors where access control is specified in the Room Data Sheets; and

(ii) at all doors in rooms or spaces for which there is no Room Data Sheet except for the following doors, which may be provided with either electronic or conventional key access:

1. mechanical roll up doors or security grates;

2. exterior ‘Exit Only’ doors;

3. operable glazed walls or overhead folding walls; and

4. doors to areas identified by the Owner during the design phase.

(i) The Design-Builder will coordinate with the Owner during the design phase for all additional requirements.

(j) The Design-Builder will allow for special situations such as double doors.

(k) The Design-Builder will allow for flexibility in the security design including hardware and electronic safety and security requirements.

(l) All service rooms require access control comprised of:

(i) Card Reader adjacent to the latch side of the door on the public side of the doorway, with power and control connections to the access control system;

(ii) Fail-secure electric strike released by operation of the card reader, with power and control connections to the access control system;

(iii) Integration of the card reader and electric strike into the building access control system; and

(iv) Door hardware shall be a mortise lockset with lever handle providing egress and keyed access for operation in power-outage situations.

8.9.3 Video Surveillance (CCTV)

8.9.3.1 Basic Requirements

(a) Video Surveillance will align with the Policy 645 of the Owner

(b) The Design-Builder will provide a complete video surveillance system, hereinafter referred to as close circuit television system (CCTV) monitoring system including cameras, camera enclosures, video recorder and video management software.

(c) Provide interior cameras at main entrances and exterior cameras in locations to be determined in consultation with the Owner. The exterior cameras to provide full coverage of the site including walkways, parking and all high risk areas.

8.9.3.2 Performance Requirements

(a) The Design-Builder will provide:

(i) A wall mounted rack style cabinet for all equipment in the MTRs.

(ii) Wiring will consist of 4 pair CAT 6 Data Drop with purple jacket to each camera location and to the building LAN. Cabling will be in 21mm (3/4”) conduit to the head-end equipment.

(iii) Eight hours of training to the Owner’s Staff showing the operations and programming functions of the system. Provide manuals for all the equipment in the system.

(b) The Design-Builder will install, wire and program the entire system. Program the system to enable remote access through a web browser from any of the Owner’s computer workstations. Adjust all camera settings and positions to the Owner’s satisfaction.

(c) Acceptable camera manufacturer: Avigilon.

(d) The Design-Builder will provide D-Link Layer 3, 3130 PoE gigabit switches, or acceptable equivalent in consultation with the Owner and to match what the Owner is providing for the student data network.

(e) Sample of acceptable cameras (location dependent) will be as follows:

Type	Camera	Remarks	Mount
.1	1MP-HD-DOME-DN	Heater	Base mount
.2	1MP-HD-H264-DC1	3-9mm	Goosenec/Pendant
.3	3MP-HD-DOME-DN	Heater	Pendant and Base mount
.4	2MP-HD-DOME-DN	3-9mm/htr	Gooseneck mount
.5	2MP-HD-H264-D1	Heater	Base mount

(f) Approved Network Video Management system: Avigilon Control Center 7.

(g) Video recording devices shall be appropriately sized to record minimum 15 FPS and a resolution of 1080P, from all installed security cameras and for a minimum of 30 days.

(h) System output will need to be compatible with Blue Iris VMS for video review and extraction from Owner offsite VMS. If D-Link cameras and switching platform (used by the Owner) is utilized, the Owner will have storage offsite available for this project (and thus, no storage shall be allowed for by Design Builder). If system other than D-Link is utilized, then Design Builder will provide local storage and will integrate to Owner VMS offsite in consultation with the Owner.

Part 9 Sitework

9.1 Division 31 - Site Works

9.1.1 Civil Engineering

9.1.1.1 Site Infrastructure

(a) Information with regards to off-Site services is provided on the record drawings included in the Disclosed Data.

(b) The Design-Builder will be responsible for all Facility utility connections to off-Site services as required by the City of West Kelowna.

9.1.1.2 Upon request by the Owner, the Design-Builder will provide the following test and inspections results:

(a) pipe bedding and surrounding material gradations test;
(b) trench backfill compaction tests;
(c) structural fill gradation and compaction tests;
(d) sub-base aggregate gradation and compactions tests;
(e) base aggregate gradation and compaction tests;
(f) asphalt mix design;
(g) asphalt core and Marshal density tests;
(h) concrete tests;
(i) watermain pressure tests;
(j) watermain disinfection and flushing tests;
(k) sanitary sewer water exfiltration tests;

(l) sanitary sewer CCTV inspections;

(m) storm sewer CCTV inspections, including catch basin leads; and

(n) minimum field density test frequency will be in accordance with ASTM D6938 as follows:

(i) Pipe bedding – one density test per 50 lineal metres of trench.
(ii) Trench Backfill – one density test per 50 lineal metres of trench material placed in maximum 300 mm lifts.
(iii) Granular Sub-base and Granular Base – one density test per 50 lineal metres of travelled lane of road and equivalent parking lot area on the sub-base and the base material.
(iv) Engineered & General Fill – one density test per 100 m2 per lift placed in maximum 300 mm lifts.
(v) Proof Roll testing on each travelled lane of road and equivalent parking lot area on the subgrade.
(vi) The completed on-Site Servicing Quality Management Plan will be signed by a Professional Engineer registered in British Columbia and submitted to the Owner.

(o) A full demonstration of the fully pressurized irrigation system with all zones functioning through the controller.

(p) Growing medium analysis reports of a minimum of (2) samples prior to import. These should be tested for basic granular content (clay/sand/silt composition), organic matter, pH, and nutrients with recommendations for amendment to meet specifications, as required. Growing medium should be tested by Pacific Soil Analysis, 11720 Voyageur Way, Ricmond BC, V6X 3G9, 1-604-273-8226, or equivalent.

9.1.1.3 Storm Sewer and Drainage

(a) Prepare and submit an Integrated Stormwater Management Plan for the Site.

(b) Design and construct a storm drainage system for all on-Site and off-Site drainage works, in accordance with the City of West Kelowna requirements including, but not limited to:

(i) City of West Kelowna Works and Services Bylaw No. 0249;

(ii) City of West Kelowna Zoning Bylaw No. 0265;

(c) Design Considerations.

(i) Integrate the landscape design aspects where possible, including drainage for the playing field.

9.1.1.4 Watermain Appurtenances

(a) Design and construct all watermain and water services, including connection and off-Site improvements to existing watermain, in accordance with City of West Kelowna requirements including, but not limited to:

(i) City of West Kelowna Works and Services Bylaw No. 0249;

(ii) City of West Kelowna Zoning Bylaw No. 0265;

Service to be sized to supply potable water, fire protection and irrigation.

(b) Provide written notice to the City of West Kelowna at least 72 hours prior to connection to the off-Site water system. Coordination with City staff and a tie-in plan must be provided and approved by the City prior to and tie-ins.

(c) System to be tested (pressure tested and bacteriological) and approved by the City prior to any connection to the existing watermain.

9.1.1.5 Sanitary Sewer

(a) Design and construct a sanitary sewer system for all on-Site and off-Site sewer works, in accordance with the City of West Kelowna requirements including, but not limited to:

(i) City of West Kelowna Works and Services Bylaw No. 0249;

(ii) City of West Kelowna Zoning Bylaw No. 0265;

9.1.1.6 Road Works Minimum Standards

~~(a)~~ NOT IN USE

~~(i)~~ NOT IN USE

(b) Parking lots and driveways will be paved with hot-mix asphaltic concrete.

(c) Pavement structure will meet requirements by a geotechnical engineer.

(d) Asphalt surface grades in parking lots and driveways will be a minimum of 1.0% slope and will not exceed 3.5% slope.

(e) Concrete gutter grades in parking lots will be a minimum of 0.7%.

(f) Curbs, gutters, and sidewalks will be concrete barrier curb type, unless otherwise specified herein. The concrete curb and gutter will be non-mountable.

(g) Provide speed control and traffic calming design measures.

(h) Vehicular and Pedestrian Routes

(i) On-Site Roadways:

1. 7.0m width;
2. 50mm asphalt;
3. 100mm crushed granular base (19mm minus);
4. 200mm granular subbase (75mm minus); and
5. approved compacted subgrade (CBR of 5 to 10). Must be proof-rolled to check for soft spots.

(ii) Bus Route, Waste Truck and Fire Lane;

1. All bus route paths, waste truck paths and fire lane travel paths will be 75mm thick asphalt with appropriate subbase and base.

(iii) Parking lot:

1. 50mm asphalt
2. 100 mm crushed granular base (19mm minus);
3. 200mm granular subbase (75mm minus); and
4. approved compacted subgrade (CBR of 5 to 10). Must be proof-rolled to check for soft spots.

(iv) Waste / Recycling:

1. Provide 1 – 3 sides garbage enclosure. The enclosure is to be a minimum of 3400mm x 16,200mm. The structure walls are to be constructed out of Ground Faced concrete blocks complete with decorative concrete caps on top of the walls. Walls are to be a minimum of 2400mm high. The enclosure is to be secured on top of a 150mm minimum concrete pad complete with rebar throughout. An accessory raised steel platform is to be constructed. The platform is to allow users to access the garbage bins.
2. 6 Garbage bins are to be provided by the owner. The Design Builder is to install the garbage bins on the concrete pad as required.
3. 1 lockable 1000mm minimum wide x 2400mm high chain-link gate to be provided at the end of the enclosure closest to the School. Gate to include a locking latch. The gate will provide direct access to the rear of the raised platform.
4. Location to be within 25 meters from a double door that is central to the School. There will be a smooth hard surface path, min 1200mm width, from the doors to the bin location.
5. 100mm reinforced concrete pad to suit waste / recycling bins;
6. Concrete pad to be 3050mm x 3650mm;
7. Top of concrete pad to be 100mm higher than the travel lane elevation for the waste/recycle truck.
8. Pads to be placed to accommodate the Owners waste/recycle truck,

which is a side loading application;
9. 100 mm crushed granular base (19mm minus);
10. 200mm granular subbase (75mm minus); and
11. approved compacted subgrade.

(i) Pedestrian Routes

(i) Sidewalks:

1. Width: varies as illustrated on design drawings, minimum of 1200mm wide;
2. Entrance path to main entry of the School will be a minimum of 3650mm.
3. Thickness: 100mm concrete or 150mm concrete when combined with mountable curb or driveway crossing;
4. 100mm crushed granular base; and
5. approved compacted subgrade.

9.1.1.7 Fences and Gates

(i) Fencing must be provided around the perimeter of the entire Site.

(ii) Fencing must be a minimum of 1830mm high, except along the goal lines and backstops of the sports fields which will be 4500mm high.

(iii) Fence materials will be chain-link, designed and fabricated to guarantee a minimum 40-year lifetime.

(iv) Fencing will be galvanized.

(v) Fences will be installed as per manufacturer's directions.

(vi) Limit total settlement of fencing to 12mm maximum over the Design Life of the Building.

(vii) Provide securable chain link vehicular access gate at vehicle entrances to Site

9.1.1.8 Flagpoles

(a) Three (3) engineered flagpoles with bases will be provided on Site.

(i) Location to be in proximity to the main School entrance, visual to the office.

9.2 Division 32 – Earthworks

9.2.1 The civil design requirements apply to those aspects of the design that pertain to the Site, underground utilities, roads on-Site and off-Site, and storm drainage.

9.2.2 All deep utilities (sanitary sewer, storm sewer, water) must be installed in accordance with all local

Bylaws and the materials referenced in 9.2.3 below.

9.2.3 Refer to:

9.2.3.1 Geotechnical and environmental information in the Disclosed Data;

9.2.3.2 City of West Kelowna Works and Services Bylaw No. 0249;

9.2.3.3 City of West Kelowna Zoning Bylaw No. 0265;

9.3 Division 33 - Off-Site Improvements

9.3.1 The Design Builder will comply with and construct all off-Site improvements in accordance with City of West Kelowna Works and Services Bylaw No. 0249 and all other City requirements.

9.3.2 Civil Engineering

9.3.2.1 Road works

(a) Design and construct roadways and pathways, including the pavement, curbs and gutters, sidewalks, walkways, running path, signage and pavement markings in accordance with:

(i) City of West Kelowna Works and Services Bylaw No. 0249;

(ii) City of West Kelowna Zoning Bylaw No. 0265;

(b) Curbs, gutters, and sidewalks will be concrete type, unless otherwise specified herein. The concrete curb and gutter will be non-mountable barrier curb and gutter.

(c) Off-Site Roadways:

1. Width – match existing;
2. 100mm asphalt;
3. 100mm crushed granular base (19mm minus);
4. 200mm granular subbase (75mm minus); and
5. approved compacted subgrade (CBR of 5 to 10). Must be proof-rolled to check for soft spots.

(d) Pedestrian Routes

(i) Sidewalk:

1. Width: minimum requirement to meet City requirements;
2. Thickness: 100mm concrete or 150mm concrete when combined with mountable curb or driveway crossing;

3. 100mm crushed granular base; and

4. approved compacted subgrade

9.4 Division 34 – Utilities

9.4.1 Sanitary Sewer

9.4.1.1 Provide sanitary sewer service for the Site in accordance with:

(i) City of West Kelowna Works and Services Bylaw No. 0249;

(ii) City of West Kelowna Zoning Bylaw No. 0265;

9.4.1.2 Service connection location to the City of West Kelowna infrastructure are shown on the record drawings located in the Disclosed Data.

9.4.1.3 Minimum service from the Building will be 200mm at a minimum grade of 1.0%.

9.4.1.4 Existing sanitary sewer system is shown on the record drawing located in the Disclosed Data.

9.4.2 Storm Sewer

9.4.2.1 Provide storm sewer servicing for the Site in accordance with:

(i) City of West Kelowna Works and Services Bylaw No. 0249;

(ii) City of West Kelowna Zoning Bylaw No. 0265;

(b) temporary onSite flooding in areas such as sports fields and parking areas is acceptable during extreme storm events (100 year return period or greater), with drawdown times not exceeding 72 hours. Access for emergency vehicles must be maintained at all times

9.4.2.2 Water Supply and Fire Protection

9.4.2.3 Provide water servicing for the Site in accordance with:

(i) City of West Kelowna Works and Services Bylaw No. 0249;

(ii) City of West Kelowna Zoning Bylaw No. 0265;

9.4.2.4 Water supply to meet the demand outlined by the mechanical engineer for both domestic and fire protection. Service to be sized for a building fire suppression sprinkler system.

9.4.2.5 Existing water mains and service are shown on the record drawings in the Disclosed Data.

9.4.2.6 Verify existing hydrant spacing to ensure fire hydrants are located within 45m of fire department connections and will meet Fire Underwriters Survey (FUS) requirements.

9.4.2.7 The building supply to be designed such that the FUS calculated requirement is below what the City of West Kelowna water system can provide. Note: On-Site and off-Site improvements will be necessary to achieve fire flow and water quality objectives.

9.5 Temporary Works

9.5.1 Services and Systems

9.5.1.1 As stipulated throughout this Statement of Requirements, the Design-Builder is accountable for the implementation and metering of any required services or systems servicing the construction of the Facility, including water, sewer, drainage, power, gas, communication and accommodation.

9.5.2 Other Requirements

9.5.2.1 During the construction period, the Design-Builder will:

(a) have the sole responsibility for the design, erection, operation, maintenance and removal of temporary services, structures and other temporary facilities and the design and execution of construction methods required in their use; and

(b) provide its own services necessary for the Design-Builder's construction use including gas, power, internet, phone, water, sewage, garbage, recycling, facilities.

APPENDIX 1A

DESIGN SUBMITTALS

See separate document.

Appendix 1A

DESIGN SUBMITTALS

1.1 Progressive Submittals

1.1.1 The Design-Builder is to make submissions to the Owner in accordance with Schedule 2 Review Procedure.

1.1.1.1 The Design-Builder will provide an online document management system accessible to the Owner for the design stage and through the end of the construction and warranty period. The online document management system will include functionality to allow the Owner's on-going access to records after the warranty period.

1.1.1.2 Refer to the corresponding sections and tables within this Section for minimum list of documents to be submitted at each stage.

1.1.2 Shop Drawings

1.1.2.1 Shop drawings shall be submitted in S.I. (Metric) Units. Shop drawings not submitted in the correct units will be automatically returned without review.

1.1.2.2 Group shop drawings by specification section for inclusion in Maintenance Manual. Do not combine items into a single submission without separate cover pages for each piece of equipment.

1.1.2.3 Submit materials and equipment by manufacturer, trade name and model number. Include copies of applicable brochure or catalogue material. Maintenance and operating manuals must be included but are not suitable submittal material on their own.

1.1.2.4 . Submit shop drawings and product data, including detailed plans and sections and details indicating construction, connections, propulsion system, and installation requirements for review and approval by the Owner.

1.1.2.5 Shop Drawings will be reviewed by the Design Builder's consultants and then copies of the reviewed Shop Drawings will be submitted to the Owner.

1.1.2.6 Submit Shop Drawings per the following list:

01 35 33	Infection Control Procedures
01 50 00	Temp Facilities & Controls
03 10 00	Concrete Forming and Accessories
03 20 00	Concrete Reinforcing
03 30 00	Cast-in-Place Concrete
03 53 00	Concrete Topping
04 21 00	Clay Unit Masonry Assemblies
04 22 00	Concrete Unit Masonry
05 10 00	Structural Steel
05 31 00	Steel Decking

05 45 00	Load Bearing Steel Studs (Metal Support Assemblies)
05 50 00	Metal Fabrications
06 10 00	Rough Carpentry
06 20 00	Finish Carpentry
06 40 00	Architectural Woodwork
07 13 00	Below Grade Sheet Waterproofing
07 14 16	Cold Fluid Applied Waterproofing
07 16 16	Crystalline Waterproofing
07 18 13	Pedestrian Traffic Coatings
07 18 16	Vehicular Traffic Coatings
07 21 00	Building Insulation
07 21 19	Foamed in Place Polyurethane Insulation
07 21 29	Spray Applied Mineral Fibre Insulation
07 25 00	Weather Barriers
07 42 13	Metal Wall Panels
07 42 63	Zinc Wall Panel Assemblies
07 43 00	Composite Wall Panels
07 43 23	Ext Grade Wood Composite Panels
07 44 19	Terra Cotta Clay Wall Panel Assemblies
07 46 43	Mineral Fibre Reinforced Composite Panels
07 52 16	SBS Membrane Roofing
07 62 00	Sheet Metal Flashing & Trim
07 81 00	Applied Fireproofing
07 81 23	Intumescent Fireproofing
07 84 00	Firestopping & Smoke Seals
07 92 00	Joint Sealants
08 11 00	Metal Doors & Frames
08 21 00	Wood Doors
08 31 00	Access Doors & Panels
08 33 00	Coiling Doors and Grilles
08 34 73	Sound Control Door Assemblies
08 35 13	Folding Security Grilles
08 41 13	Aluminum Framed Entrances and Storefronts
08 42 29	Automatic Entrances
08 44 13	Glazed Aluminum Curtain Walls
08 71 00	Door Hardware
08 74 00	Access Control Hardware
08 81 00	Glass & Glazing
08 90 00	Louvres and Vents
09 21 16	Gypsum Board Assemblies
09 30 00	Ceramic Tiling
09 51 00	Acoustical Ceilings
09 65 00	Resilient Flooring
09 67 00	Fluid Applied Flooring
09 68 13	Tile Carpeting

09 84 00 Acoustic Room Components
09 90 00 Painting & Coating
10 11 00 Visual Display Surfaces
10 14 00 Signage
10 21 14 Toilet Compartments
10 21 23 Cubicle Curtain and Track
10 26 00 Wall and Door Protection
10 28 13 Toilet and Bath Accessories
10 44 00 Fire Protection Specialties
10 51 00 Metal Lockers
10 71 13 Exterior Sun Control Devices
11 24 23 Fall Arrest Equipment
11 40 00 Food Services Equipment
12 24 00 Window Coverings
12 36 00 Countertops
12 48 16 Entrance Floor Grilles
12 50 00 Furniture
12 93 00 Site Furnishings
12 93 33 Manufactured Planters
14 21 13 Electric Traction Elevators.
19 00 10 Geoexchange Design Worksheet Submittal
19 00 12 Graphical Representation of Heating/Cooling Duration Profile
19 00 14 Detailed Geoexchange Ground Heat Exchanger Drawings
19 20 15 Geoexchange Material Submittal
19 20 30 Geoexchange Qualifications Submittal 20 05 13
Motors Starters and Wiring
20 05 14 Adjustable Frequency Drives
20 05 16 Flex Connections, Expansion Joints, Anchors and Guides
20 05 18 Flow and Energy Meters
20 05 19 Indicating Gauges
20 05 23 Valves
20 05 29 Hangers and Supports
20 05 48 Vibration and Seismic Controls
20 05 49 Seismic Restraint Systems
20 05 53 Identification Equipment Insulation
20 07 19 Piping Insulation
20 08 01 Start-Up and Performance Testing Reporting
21 13 13 Wet Pipe Sprinkler System
21 13 16 Dry Pipe Sprinkler System
22 10 10 Plumbing Pumps
22 11 16 Domestic Water Piping
22 33 13 Domestic Water Heaters
22 42 01 Plumbing Specialties
22 42 03 Plumbing Fixtures and Trim
23 11 33 Natural Gas Systems

23 13 13	Oil Storage Tanks
23 13 15	Fuel Oil Pumps
23 13 19	Fuel Filtration Systems
23 15 13	Fuel Management System
23 21 11	Water Specialties-Heating and Cooling
23 21 13	Steel Pipe and Fittings – Heating and Cooling
23 21 23	Pumps – Heating and Cooling
23 25 13	HVAC Water Treatment Systems
23 34 05	Fans
23 36 13	Terminal Boxes
23 37 13	Grilles, Registers and Diffusers
23 51 16	Fabricated Breeching and Accessories
23 51 19	Fabricated Stacks
23 51 33	Insulated Sectional Chimneys
23 52 16	Packaged Hot Water Boiler - Condensing
23 52 39	Packaged Boiler – Fire Tube
23 53 16	Deaerator
23 57 13	Heat Exchangers
23 61 09	Refrigerant Detection System
23 64 16	Packaged Chiller
23 65 13	Cooling Towers
23 65 15	Indirect Air-Side Economizer Recirculation Cooling Unit
23 73 10	Air Handling Units
23 74 33	Makeup Air Unit
23 81 26	Ducted Split Air Conditioners
23 82 19	Electric Reheat Coils
23 82 39	Unit Heaters
23 84 13	Humidifiers
25 05 01	EMC General Requirements
26 05 31	Splitters, Junction, Pull Boxes and Cabinets
26 05 33	Outlet Boxes, Conduit Boxes and Fittings
26 05 36	Cable Trays
26 09 23.01	Meter and Switchboard Instruments
26 09 24	Lighting Control System and Devices
26 12 16	Transformers
26 24 13	Switchboards
26 27 16	Electrical Cabinets and Enclosures
26 27 26	Wiring Devices
26 28 23	Disconnect Switches
26 29 10	Motor Starters
26 32 13	Generator
26 36 23	Transfer Switches
26 50 00	Lighting
26 52 13	Exit and Emergency Lighting Systems
27 05 26	Grounding and Bonding for Communications Systems

27 05 28	Communications Cable Trays and Pathways
27 31 00	Voice Communications Switching and Routing Equipment
27 51 16	Public Address System
28 10 00	Access Control System
28 13 27	Security Door Supervision
28 31 00	Intrusion System
28 31 00	Fire Alarm System
31 00 00	Earthwork
31 23 01	Excavating Trenching & Backfilling
32 01 90.33	Tree Protection
32 11 16.1	Granular Subbase
32 11 23	Granular Base
32 12 13.2	Asphalt Prime
32 12 16	Asphalt Paving
32 13 13	Portland Cement Concrete Pavement
32 14 13	Precast Concrete Unit Paving
32 17 23	Painted Pavement Markings
32 18 16	Synthetic Resilient Surfacing
32 80 00	Irrigation
32 91 13	Growing Medium Preparation
32 92 93	Sodding
32 93 00	Planting
33 11 01	Waterworks
33 30 01	Sanitary Sewers
33 40 01	Storm Sewers
33 44 01	Manholes and Catch basins

1.1.2.7 Samples

1.1.2.7(1) Each sample that has reached "reviewed" status will be retained on the job site until final completion of the project.

1.1.2.7(2) Provide a sample board indicating exterior material finishes submittal by the Owner.

1.1.2.7(3) provide a master colour sample palette and sample board of interior finishes for approval by the Owner.

1.1.2.8 All equipment plans will show installation, removal, and maintenance clearances.

1.1.3 Architectural Design Submittals

Percentage Complete at Submission Stages	30%	60%	95%	100%	Record Drawings
Drawing Content					
Site plans, context site plans, sections, and details – includes coordination with civil works, hard landscape features and site servicing	✔	✔	✔	✔	✔

Percentage Complete at Submission Stages	30%	60%	95%	100%	Record Drawings
Title sheet, legends, drawing list, key plans, and assembly listings	✔	✔	✔	✔	✔
Assembly Schedule	✔	✔	✔	✔	✔
Floor plans, penthouse, and roof plans	✔	✔	✔	✔	✔
Reflected ceiling plans	✔	✔	✔	✔	✔
Exterior elevations	✔	✔	✔	✔	✔
Interior elevations	-	✔	✔	✔	✔
Building sections, transverse, longitudinal	✔	✔	✔	✔	✔
Wall sections		✔	✔	✔	✔
Large scale plans, lobbies, special purpose spaces, conference rooms, kitchens	✔	✔	✔	✔	✔
Plan and section details	-	✔	✔	✔	✔
Vertical movement – plans, sections, and details	✔	✔	✔	✔	✔
Special elements, furnishings, signage	-	✔	✔	✔	✔
Schedules, doors, windows, hardware, finishes.	-	✔	✔	✔	✔
Millwork – plans, sections, and details	-	✔	✔	✔	✔
Code Compliance - Fire Separations (vertical and horizontal), Exiting Travel Distance Plans, Occupant loads, and exit width capacities	✔	✔	✔	✔	✔
Code Compliance Report	✔	✔	✔	✔	✔
Specifications					
Table of Contents	-	✔	✔	✔	-
General Requirements	-	✔	✔	✔	-
Existing Conditions – if any	-	✔	✔	✔	-
Concrete	-	✔	✔	✔	-
Masonry	-	✔	✔	✔	-
Metals	-	✔	✔	✔	-
Wood, Plastics and Composites	-	✔	✔	✔	-
Thermal and Moisture Protection	-	✔	✔	✔	-
Openings	-	✔	✔	✔	-
Door Hardware; Door program and functioning started in coordination with requirements for Electronic Safety and Security	-	✔	✔	✔	-
Finishes	-	✔	✔	✔	-
Specialties	-	✔	✔	✔	-
Equipment	-	✔	✔	✔	-
Furnishings	-	✔	✔	✔	-
Special Construction – if any	-	✔	✔	✔	-
Conveying Equipment – Elevators	-	✔	✔	✔	-
Other					
Colour Boards Master Colour Palette	-	✔	✔	✔	-
Sample boards	-	✔	✔	✔	-

Percentage Complete at Submission Stages	30%	60%	95%	100%	Record Drawings
3-Dimensional renderings	✔	✔	✔	✔	-
Submittals					
Vibration Monitoring Details	-	-	-	✔	-
Noise Control Plan	-	-	-	✔	-
Wayfinding	-	-	-	✔	-

1.1.3.1 The Design-Builder will provide Design Submittals that include the following items as required to achieve the percentage of completion for the submissions.

1.1.3.2 The Design Submittals will clearly indicate:

1.1.3.2(1) Floor elevations (geodetic, on floor plans, sections, and elevations) complete with floor level changes, stairs, and ramps; and

1.1.3.2(2) Floor finishing tolerances, slopes for drainage, drain openings will be identified.

1.1.3.3 Code Design Submittals

1.1.3.3(1) Code Compliance Report will contain:

1.1.3.3(1)a. BCBC Data Matrix including design considerations; and

1.1.3.3(1)b. Fire and Life Safety Data Summary (may be illustrated graphically).

1.1.3.3(2) When applicable, Alternative Solutions will contain:

1.1.3.3(2)a. Any operational impacts of the Alternate Solution; and

1.1.3.3(2)b. Any maintenance impacts of the Alternate Solution.

1.1.3.4 Assembly Schedules will contain:

1.1.3.4(1) Assemblies and their make-up including a graphical section and a list of each material layer for each distinct opaque wall, roof, soffit, balcony, deck, patio, floor, ceiling, and transparent glazing assembly.

1.1.3.4(2) Effective clear field R-values and U-value for each exterior opaque wall, roof, soffit, deck, floor, ceiling and transparent glazing assembly.

1.1.3.4(3) All required fire resistance ratings and acoustical ratings.

1.1.3.5 Plans, Sections and Elevations will contain:

1.1.3.5(1) 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;

1.1.3.5(2) Clearly indicated functions of each building material component and rain screen construction component, e.g. air barrier, vapour barrier, moisture barrier, acoustical barrier, security barrier, fire resistance, thermal resistance;

1.1.3.5(3) The location of doors and windows, and other openings complete with cross-references to door, window, and hardware schedules;

1.1.3.5(4) The location of fixtures and equipment for washrooms, kitchens, conference rooms, equipment/mechanical/electrical/communications rooms complete with cross-references to equipment schedules, notes, and dimensions;

1.1.3.5(5) Clearly indicated barrier-free access, path of travel, clearances complete with notes and dimensions;

1.1.3.5(6) Designate room name and number of interior space. Maintain Owner room reference number as stated in Appendix 1B Room Data Sheets. Propose a strategy for final room numbering for review and coordination with the Owner per section 2.12 soon after the 60% submittal. Final numbering will be resolved, coordinated and shown on the 95% submittal;

1.1.3.5(7) Graphically represent construction and finish materials for walls and floors;

1.1.3.5(8) Illustrate built-in furniture, millwork, and equipment;

1.1.3.5(9) Graphically illustrate fire separation(s), acoustic separation(s), security separation(s); and

1.1.3.5(10) Gridlines and Gridlines dimensions.

1.1.3.6 Reflected Ceiling Plans will contain:

1.1.3.6(1) Graphical representation of ceiling finishes, equipment, luminaires complete with cross-reference to lighting, security, sprinkler, HVAC, fire alarm, and ceiling heights;

1.1.3.6(2) Clearly indicated bulkheads complete with graphical representation of construction and materials, notes, ceiling heights and dimensions; and

1.1.3.6(3) Clearly indicated graphical representation of systems and equipment interference for structural, mechanical, electrical, telecommunications, security complete with cross-reference notes and dimensions.

1.1.3.7 Penthouse and Roof Plans will contain:

1.1.3.7(1) The location of fixtures and equipment for mechanical, electrical, maintenance complete with notes and dimensions;

1.1.3.7(2) Clearly indicated roof penetrations for equipment, hatches, access paver paths, fall arrest anchors, antennae supports/ties; and

1.1.3.7(3) Graphically represent construction and finish materials for roof.

1.1.3.7(4) Drainage strategy including location of drains and overflows, as well as direction of roof slopes to prevent ponding

1.1.3.8 Exterior Elevations will contain:

1.1.3.8(1) The location of doors and windows, borrowed lights, and other openings;

1.1.3.8(2) Graphical representation of construction and finish materials, including a legend and notations;

1.1.3.8(3) Scuppers, downs spouts or drainage systems, hose bibs and electrical outlet and exterior light locations; and

1.1.3.8(4) Landscape treatment proposed in relation to exterior and windows.

1.1.3.9 Interior Elevations will contain:

1.1.3.9(1) The location of doors, windows, and other openings; all wall mounted equipment, mechanical, electrical, IMIT devices, security devices, dimensions of vertical changes in material, room numbers;

1.1.3.9(2) Graphical representation of construction and finish materials including a legend and notations is to be provided: and

1.1.3.9(3) Clearly indicate wall finishes, colour choices and details.

1.1.3.10 Building Sections will contain:

1.1.3.10(1) Clearly indicated floor construction/assemblies, floor elevations, dimensions, and ceiling lines; and

1.1.3.10(2) Clearly indicated graphical representation of systems and equipment interference for structural, mechanical, electrical, telecommunications, security complete with cross-reference notes and dimensions.

1.1.3.11 Wall Sections (scale 1:20) will contain:

1.1.3.11(1) Clearly indicated detail location tags and references; wall type notations; and critical dimensions; and

1.1.3.11(2) Clearly indicated graphical representation of systems and equipment interference for structural, mechanical, electrical, telecommunications, security complete with cross- reference notes and dimensions.

1.1.3.12 Provide large Scale Plans and interior elevations to 1:50 or larger scale for the following spaces:

The following spaces, including all rooms related to them as shown in the ROom Data Sheets in Appendix 1B: Add as needed.

1.1.3.12(1) Non-programmed spaces not shown in Appendix 1B Room Data Sheets

1.1.3.12(1)a. Mechanical Rooms;

1.1.3.12(1)b. Electrical Rooms; and

1.1.3.12(1)c. IMIT Rooms.

1.1.3.13 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, and notes.

1.1.3.14 Millwork plans, sections and details will clearly indicate millwork layout, section elevations, and details complete with material choices, notes, and dimensions.

1.1.3.15 Special elements, furnishings, systems furniture, signage will contain:

1.1.3.15(1) Detailed graphical representations of furniture, systems furniture, signage in relation to exterior and interior walls, structural framework, material connections and interrelationships complete with cross- reference to schedules, notes, materials, and dimensions;

1.1.3.15(2) Detailed location of fixtures and equipment for telecommunications, IMIT, security complete with cross-reference to equipment schedules, notes, and dimensions; and

1.1.3.15(3) Base-building elements will be graphically distinct from special elements.

1.1.3.16 Schedules (Doors, Hardware, Windows, Room Finishes, Furniture) will contain:

1.1.3.16(1) Clearly indicated material, size, fire / thermal / acoustic / security resistance rating, colour, texture, pattern; and

1.1.3.16(2) Schedules may be graphical and/or tabular in drawing or specification format.

1.1.3.17 Room Data Sheets

1.1.3.18 Handrail and wall protection plans. Prepare and propose to the Owner locations and types of all handrails, bumper guards, wall protection, and consult with the Owner to determine locations and types .

1.1.3.19 Accommodations for future expansion will be clearly indicated on site plans and floor plans including the gross area of the expansion zone.

1.1.3.20 Building envelope maintenance and renewals plan to cover a 50-year service life.

1.1.4 Civil Design Submittals Percentage of drawings completed

Percentage Complete at Submission Stages	30%	60%	95%	100%	Record Drawing
Drawing Content					
Title sheet, typical sections, and details Existing Conditions	✔	✔	✔	✔	✔
Erosion and Sediment Control Temporary Service during Construction	✔	✔	✔	✔	✔
Site Coordination Layout, turning templates for emergency and service vehicles	✔	✔	✔	✔	✔
Storm Water Drainage Plan	✔	✔	✔	✔	✔
Grading, site servicing, roads, parking lot(s), hardscape, and streetlights	✔	✔	✔	✔	✔
Deep and Shallow Utilities Plan and profile, on and off site	✔	✔	✔	✔	✔
Retaining Walls Plan and Profile (< 1.0 m high)	✔	✔	✔	✔	✔
Sections and details	✔	✔	✔	✔	✔
Pavement Marking and Signage Plans	✔	✔	✔	✔	✔
Constructing phasing	✔	✔	✔	✔	✔
Offsite Drawings	✔	✔	✔	✔	✔
Specifications					
Clearing, Grubbing & Stripping	✔	✔	✔	✔	-

Percentage Complete at Submission Stages	30%	60%	95%	100%	Record Drawing
Earthworks	✔	✔	✔	✔	-
Site Servicing	✔	✔	✔	✔	-
Water, Sanitary Sewer and Storm Sewer	✔	✔	✔	✔	-
Manholes and Catchbasins	✔	✔	✔	✔	-
Watermain Flushing, Pressure Testing & Disinfection Plan	✔	✔	✔	✔	-
Base and Sub Base Coarse Aggregates	✔	✔	✔	✔	-
Asphalt Paving	✔	✔	✔	✔	-
Exterior Improvements	✔	✔	✔	✔	-
Cast-in-Place Concrete	✔	✔	✔	✔	-
Pavement Markings	✔	✔	✔	✔	-
Submittals					
Monthly Site Maintenance Inspection per Section 8.4.8.5				✔	

1.1.4.1 Existing Conditions Drawing will contain all pertinent topographic information, contours at appropriate interval 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.

1.1.4.2 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 the Facility, stormwater discharge connection and location, quality measurement point and details of erosion and sediment control facilities.

1.1.4.3 Site Coordination and Layout Drawing will contain:

1.1.4.3(1) Horizontal and vertical control, 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, watermain, sanitary sewer, storm sewer.), site removals;

1.1.4.3(2) Demonstrated vehicle and pedestrian movements for all types of expected traffic to and from the Facility;

1.1.4.3(3) 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 streetlight locations;

1.1.4.3(4) Deep and Shallow Utilities plan and profile will contain horizontal location and vertical depths of new, existing, and temporary services; utilities; manholes; drainage structures; valves; roof leader tie in points; location of foundation drainage (if required); structure data table; pipe load and capacities per BCBC;

1.1.4.3(5) Site Servicing Plan will include phasing plan for watermain flushing, pressure testing and disinfecting the services to the new Facility. Plan to be submitted and reviewed by the Authority having Jurisdiction for approval, either as part of the permit submittal or a separate meeting;

1.1.4.3(6) Storm Water Management Plan will contain catchment areas, existing storm sewer system, flow direction, calculations for pre-development and post-development flows, detention calculations, and best management practices; and

1.1.4.3(7) Offsite drawings will include all drawings and details required by the District to secure a Works and Services Agreement for the offsite works.

1.1.5 Structural Design Submittals

Percentage Complete at Submission Stages	30%	60%	95%	100%	Record Drawing
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)	✔	✔	✔	✔	-
Wood (Division 06)	✔	✔	✔	✔	-
Piling (Division 31)	✔	✔	✔	✔	-
Submittals					
Bi-weekly Structural and Geo Technical Field Reports	-	-	-	✔	-
Shoring & Re-shoring	-	-	-	✔	-
Rebar Matting with Owner on Site)	-	-	✔	✔	-

1.1.5.1 Title Sheet, General Notes, will contain:

1.1.5.1(1) General description of the structure, its main components, gravity load resisting and lateral load resisting systems;

1.1.5.1(2) Codes and standards, with dates of issue, to which the Design conforms;

1.1.5.1(3) Description of the lateral load resisting system will indicate values of Rd (ductility factor) and Ro (overstrength factor) used in the Design;

1.1.5.1(4) Importance factors used in the Design;

1.1.5.1(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

1.1.5.1(6) Horizontal design loads indicated including seismic loads, wind loads, lateral earth pressures and hydrostatic pressures;

1.1.5.1(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;

1.1.5.1(8) Geotechnical information used in the Design including reference to geotechnical report, footing or pile bearing capacities, site classification and site coefficients;

1.1.5.1(9) Concrete mix requirements indicating application, exposure classification, minimum 28-day compressive strength, and maximum aggregate size; and

1.1.5.1(10) Concrete cover requirements, based on weather and soil exposure, fire resistance rating, or chloride penetration.

1.1.5.2 Schedules as required for items such as columns, beams, slabs, walls, foundations, baseplates, and embed plates.

1.1.5.3 Foundation plans, fully coordinated with other consultant's drawings, will contain:

1.1.5.3(1) Gridlines and gridline dimensions;

1.1.5.3(2) Foundation types, sizes, and reinforcement, including strip footings, pad footings, rafts, piles and pile caps, soil anchors and grade beams. Foundations should 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 adfreeze mitigation measures;

1.1.5.3(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 are sufficiently detailed. Show pits for elevators and mechanical openings;

1.1.5.3(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;

1.1.5.3(5) Concrete columns, pedestals and pilasters including dimensions and reinforcement, including tie arrangement details;

1.1.5.3(6) Steel columns including size and base plate details; and

1.1.5.3(7) Load bearing masonry and or wood / engineered stud 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.

1.1.5.4 Floor and Roof Framing Plans, fully coordinated with other consultant's drawings, will contain:

1.1.5.4(1) Gridlines and gridline dimensions;

1.1.5.4(2) 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. Small diameter penetrations such as 6" or less in size would not be considered 'openings;

1.1.5.4(3) Concrete and masonry walls including thickness and reinforcement and wood frame walls including member sizes and spacing with plywood sheathing thickness and nailing noted. 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;

1.1.5.4(4) 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; Structural steel and timber columns will be likewise detailed;

1.1.5.4(5) Concrete beams including reinforcement and dimensions for beams of concrete, timber, and structural steel. Elevate concrete beams with complex reinforcement. Ensure beams are sufficiently detailed c/w connections as appropriate;

1.1.5.4(6) Detail concrete stairs, including throat thickness, reinforcement, and sufficient details for cast in place stairs. For precast concrete stairs provide sufficient seating details;

1.1.5.4(7) 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;

1.1.5.4(8) 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;

1.1.5.4(9) Steel columns including size, base plate, embed plate and cap plate details;

1.1.5.4(10) Detail steel stairs, including stringer sizes and connection details; and

1.1.5.4(11) Wood frame, engineered lumber, heavy timber and pre-engineered; trusses for floor and roof construction if applicable including all member sizes and connections. This to also include all plywood sheathing and connections including those for diaphragm loading. Provide all design forces for beam and joist connections as well design forces for pre- engineered trusses to ensure that all elements, connections, and diaphragm forces are adequately detailed.

1.1.5.5 Elevations, fully coordinated with other consultants' drawings, for the following items:

1.1.5.5(1) Concrete masonry and wood frame 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;

1.1.5.5(2) Concrete beam elevations for beams with complex reinforcement;

1.1.5.5(3) Steel bracing elevations including member sizes, forces, and sufficient information for connection designer; and

1.1.5.5(4) Any other elevations deemed necessary to convey sufficient structural information.

1.1.5.6 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, connection configurations, fasteners, and welding.

1.1.6 Mechanical Design Submittals

Percentage Complete at Submission Stages	30%	60%	95%	100%	Record Drawing
Drawing Content					
Legends, regulatory data, drawing list, key plans	✔	✔	✔	✔	✔
Fire suppression – plans, sections, details, and schematics	✔	✔	✔	✔	✔
Plumbing – plans, sections, details	✔	✔	✔	✔	✔
Heating and Cooling (Hydronic) – plans, sections, details, and schematics	✔	✔	✔	✔	✔
HVAC – plans, sections, details	✔	✔	✔	✔	✔
Integrated Automation – plans, sections, details Schematics and schedules, air and water flow diagrams, equipment schedules, control schematics, sequence of operations.	✔	✔	✔	✔	✔
Specifications					
General Requirements	-	✔	✔	✔	-
Fire Suppression	-	✔	✔	✔	-
Plumbing	-	✔	✔	✔	-
Heating, Ventilating and Air Conditioning	-	✔	✔	✔	-
HVAC Integrated Automation	-	✔	✔	✔	-
Other					
Plumbing fixture matrix	✔	✔	✔	✔	-
Measurement and verification matrix	-	-	✔	✔	-
Submittals					
Flexibility of Expansion	-	-	-	✔	-
Expansion of Space	-	-	-	✔	-
Max Flow for Domestic Hot Water Supply	-	-	-	✔	-
Flue Study	-	-	-	✔	-
Ventilation Calculations	✔	✔	✔	✔	-
Air Exchange Reports	-	-	-	✔	-

1.1.6.1 Regulatory sheet – will contain (may be included on title sheet):

1.1.6.1(1) Design load assumptions and calculations.

1.1.6.2 Fire Suppression, plans, sections, details will contain:

1.1.6.2(1) Design calculations , sealed by a specialist fire protection engineer, for water flow with water supply flow data, fire pump (if required), and smoke control;

1.1.6.2(2) Sprinkler zoning including indication of dry pipe and pre-action systems;

1.1.6.2(3) Provisions to accommodate hazard classifications;

1.1.6.2(4) Clearly indicated ceiling and slab elevations (geodetic) complete with level changes, bulkheads, beams;

1.1.6.2(5) The location of doors and windows, and other openings;

1.1.6.2(6) The location of “special fire hazard / load” conditions such as compact storage shops, and other elevated hazard locations.

1.1.6.2(7) The location of fixtures and equipment for washrooms, kitchens, conference rooms, equipment/mechanical/electrical/telecommunications rooms;

1.1.6.2(8) The designation (usually by room name and number) of interior spaces including sprinkler head type;

1.1.6.2(9) Graphic indication of fire separation(s), acoustic separation(s; and

1.1.6.2(10) Any specialist fire suppression elements required as part of an Alternative Solution

1.1.6.3 Plumbing, plans, sections, details will contain:

1.1.6.3(1) Design calculations for water supply including pressure, hot water heating, sanitary waste sizing and roof drainage;

1.1.6.3(2) Riser diagrams and plant schematics with flows indicated for domestic heating and chilled water lines, waste, and vent lines; and

1.1.6.3(3) Heating and Cooling (Hydronic), plans, sections, details will contain:

1.1.6.3(3)a. Design calculations for water supply including pressure, hot water heating, glycol solution and chilled water;

1.1.6.3(3)b. Riser diagrams with flows indicated for hot, steam and chilled water lines; and

1.1.6.3(3)c. Equipment schedule.

1.1.6.4 Heating, cooling, and ventilation (HVAC) plans, sections, details will contain:

1.1.6.4(1) Design calculations for block loads for heating and cooling, system load and supply air calculations including minimum outside air to be admitted, heating and cooling load calculations for each room and zone, system pressure static analysis at peak and minimum block loads, acoustical calculations, building heating, cooling and ventilation loads, flow and head calculations for pumping systems, distribution and vibration isolation;

1.1.6.4(2) HVAC piping layouts including valves complete with locations where temperature, pressure, flow, and remote sensing is required;

1.1.6.4(3) HVAC duct layouts and true sizes (double line) including fire dampers and volume control dampers;

1.1.6.4(4) Layout of equipment rooms showing mechanical equipment including space for maintenance (filter replacement, valve adjustments) and removal / replacement of mechanical equipment (coils, heat exchangers, pumps, boilers, DHRC heat exchangers and compressors);

1.1.6.4(5) Roof plan with roof-mounted equipment and penthouses complete with indication of servicing and maintenance access;

1.1.6.4(6) HVAC outside air intake and exhaust air discharge including louvre sizes and locations relative to each other, ensuring security and acoustic concerns have been taken into consideration;

1.1.6.4(7) HVAC schematics including airflow and water flow quantities and balancing for heating and cooling equipment, flow energy measuring devices for water and air systems. Clear indication of penetrations through rated wall, floor and roof assemblies complete with details;

1.1.6.4(8) Automatic temperature control diagram(s) including control flow diagrams showing sensors, valves and controllers, sequence of operation of systems, diagram showing control signal interface with sequence of operation, locations, and connections of energy metering devices for major equipment, secondary pump heating and chilled water flow control using EPIVs, method for sequential restart after power failure;

1.1.6.4(9) Equipment schedule including but not limited to chillers, boilers, pumps, air handling units, fans, terminal units, diffusers, and grilles;

1.1.6.4(10) Clear indication of seismic restraints for HVAC systems and equipment;

1.1.6.4(11) Integrated automation plans, sections, details will contain:

1.1.6.4(11)a. Design calculations.

1.1.6.4(11)b. Integrated automation layout.

1.1.6.4(12) Schematic and schedules will contain:

1.1.6.4(12)a. Clearly indicated location, manufacturer, model, type, flow, head, speed, class, BHP, electrical, including any other information required to convey design intent,

1.1.6.4(12)b. Schedules maybe graphical and/or tabular in drawing and/or specification format.

1.1.6.5 Energy Modelling:

1.1.6.5(1) Refer to Schedule 8: Energy;

1.1.6.5(2) Using ASHRAE 140 compliant software, as detailed in the BC Hydro New Construction Energy Modelling Guideline, demonstrate that the proposed Design meets the energy use provisions of this Schedule as detailed in Part 7 and DBA Schedule 8: Energy.

1.1.6.5(3) Provide an updated energy model report with each milestone submittal (30%, 60%, 95%, 100% and Record Drawing). Refer to Appendix 1 of Schedule 8 for detailed list of information required in the report.

1.1.6.6 Geoexchange Design Submittals

1.1.6.6(1) Provide scaled and dimensioned detailed design drawings showing the configuration of the in-ground GHX headering configuration, and detailed drawings of the zone manifold configuration with manner and content similar to the indicative design drawings included as Drawings G-1 and G-2 available as project reference documents in Appendix 1G.

1.1.6.6(2) Geoexchange Ground Heat Exchange (GHX) Design Submittals

Percentage Complete at Submission Stages	30%	60%	95%	100%	Record Drawing
Drawing Content					
Geoexchange Design Worksheet Submittal	✔	✔	✔	✔	✔
Graphical Representation of Heating/Cooling Duration Profile with Depiction of Loads Served by Geoexchange	✔	✔	✔	✔	✔
Detailed Geoexchange Ground Heat Exchanger Design Drawings	✔	✔	✔	✔	✔
Geoexchange Material Submittal	-	✔	✔	✔	✔
Geoexchange Qualifications Submittal	✔	✔	✔	✔	✔

1.1.6.6(1) Geoexchange GHX Submittals

1.1.6.6(1)a. Geoexchange Design Worksheet (19 00 10): Prepare submittal to meet requirements described in Statement of Requirements; Division 19; Section 8.1.3.1.

1.1.6.6(1)b. Graphical Representation of Heating/Cooling Load Duration Profile (19 00 12): Prepare submittal to meet requirements described in Addendum 10; Item 1 (c).

1.1.6.6(1)c. Geoexchange Material Submittal (19 20 15): Prepare submittal to meet requirements described in Statement of Requirements; Division 19; Section 8.1.15 (b).

1.1.6.6(1)d. Geoexchange Qualifications Submittal (19 20 30): Prepare submittal to meet requirements described in Statement of Requirements; Division 19; Section 8.1.15 (c).

1.1.7 Electrical Design Submittals

Percentage Complete at Submission Stages	30%	60%	95%	100%	Record Drawing
Drawing Content					
Legends, regulatory data, drawing list, key plans	✔	✔	✔	✔	✔
Site plans	✔	✔	✔	✔	✔
Power Single Line Diagram	✔	✔	✔	✔	✔
Power Riser Diagram	✔	✔	✔	✔	✔
Large Scale - Electrical room equipment layouts	✔	✔	✔	✔	✔
Large Scale - Electrical room 3-D equipment layouts including equipment dimensions and equipment	-	✔	✔	✔	✔

Percentage Complete at Submission Stages	30%	60%	95%	100%	Record Drawing
removal / replacement pathways					
Grounding Riser Diagram	✔	✔	✔	✔	✔
Grounding Details	-	-	✔	✔	✔
Lightning Protection Riser, Plans	✔	✔	✔	✔	✔
Lightning Protection Details	-	-	✔	✔	✔
Lighting Control Riser	✔	✔	✔	✔	✔
Lighting Control Details	-	-	✔	✔	✔
Other Systems Risers	-	✔	✔	✔	✔
Fire Alarm and Voice IMIT System Riser	✔	✔	✔	✔	✔
Lighting and Lighting Control - Plans	✔	✔	✔	✔	✔
Lighting and Lighting Control - Circuiting	-	-	✔	✔	✔
Power - Plans	✔	✔	✔	✔	✔
Power - Circuiting	-	-	✔	✔	✔
Fire Alarm and Voice Communication Systems Plans	✔	✔	✔	✔	✔
Other Systems Plans	✔	✔	✔	✔	✔
Switchgear/switchboard/ elevations and schedules	-	✔	✔	✔	✔
Fire Alarm and Voice Communication Systems schedules	-	✔	✔	✔	✔
Site Service details	-	✔	✔	✔	✔
Miscellaneous details	-	-	✔	✔	✔
All other drawings	-	-	✔	✔	✔
Specifications					
Table of Contents: listing all sections	✔	✔	✔	✔	-
General Requirements	✔	✔	✔	✔	-
Electrical	-	✔	✔	✔	-
Branch Circuit Panelboard Schedules	-	-	✔	✔	✔
Luminaire Schedules	-	✔	✔	✔	-
Lighting Control Schedules	-	-	✔	✔	✔
Communications	-	✔	✔	✔	-
Electronic Safety and Security	✔	✔	✔	✔	-
Other					
Total load calculations (utility electric service)	✔	✔	✔	✔	-
Total load calculations (generator power)	✔	✔	✔	✔	-
Load calculations (transformer loadings)	-	✔	✔	✔	-
Load calculations (generator loadings)	-	✔	✔	✔	-
Voltage drop calculations	-	✔	✔	✔	-
Short circuit calculations	-	✔	✔	✔	-
Arc flash calculations	-	-	✔	✔	-
Coordination study	-	-	✔	✔	-
Lighting calculations	-	✔	✔	✔	-
Lightning: grounding resistivity calculations	-	-	✔	✔	-
Cable tray calculations	-	-	✔	✔	-

Percentage Complete at Submission Stages	30%	60%	95%	100%	Record Drawing
Ratings fuses, bus ducts, feeders, splitters, safety switches, panelboards, power factor correction units	✔	✔	✔	✔	-
Calculated maximum fault levels, symmetrical and asymmetrical, and protective device interrupting ratings, symmetrical and asymmetrical, at each protective device location	✔	✔	✔	✔	-
Calculated arc Flash hazard level at each protective device and switching device location	-	-	✔	✔	-
Utility metering	-	✔	✔	✔	-
Metering	-	✔	✔	✔	-
Dimensions of equipment shown	-	✔	✔	✔	-
Three dimensional drawing files provided	-	✔	✔	✔	-
Submittals					
Detailed Distribution Coordination Study	-	-	-	✔	-
Monthly System Shut Down Schedules	-	-	-	✔	-

1.1.7.1 Regulatory data – will contain design load assumptions and calculations to demonstrate code compliance.

1.1.7.2 Site plans will include:

1.1.7.2(1) Property limits;

1.1.7.2(2) Public roadways;

1.1.7.2(3) Driveways;

1.1.7.2(4) Parking lots;

1.1.7.2(5) Electric utility services;

1.1.7.2(6) Electrical site services;

1.1.7.2(7) Site lighting;

1.1.7.2(8) Exterior building lighting,

1.1.7.2(9) Maintenance hole locations with sump pump circuits as applicable;

1.1.7.2(10) Hand holes, pull pits; and

1.1.7.3 Power Single Line Diagram will include:

1.1.7.3(1) The entire electrical system from the utility service to and including distribution panels, motor control centres, chillers, motors over 25 HP;

1.1.7.3(2) Ratings of transformers, generators, breakers, transfer switches, switchgear, switchboards;

1.1.7.3(3) Potential and current transformers; and

1.1.7.3(4) Equipment names, following a consistent equipment naming methodology.

1.1.7.4 Power Riser Diagram will include:

1.1.7.4(1) The entire electrical system from the utility service to and including lighting/receptacle/lab panels, motor control centres, chillers, motors over 25 HP;

1.1.7.4(2) Equipment shown in elevation relative to their actual size,

1.1.7.4(3) Equipment shown on the floor level where they will be installed;

1.1.7.4(4) A two-dimensional relative representation of where the equipment will be located;

1.1.7.4(5) Feeders to equipment;

1.1.7.4(6) A two-dimensional representation of the routing of the feeders; and

1.1.7.4(7) Equipment names, following a consistent equipment naming methodology.

1.1.7.5 Large Scale - Electrical Room Equipment Layouts will include:

1.1.7.5(1) All electrical rooms drawn to a scale of not less than 1:50;

1.1.7.5(2) All equipment in the room shown to scale;

1.1.7.5(3) Major equipment removal/ replacement pathways;

1.1.7.5(4) Equipment door swings indicated;

1.1.7.5(5) Room doors shown; and

1.1.7.5(6) Room names and numbers.

1.1.7.6 Grounding Riser Diagram and Details will include:

1.1.7.6(1) The entire electrical grounding system from the ground grid to each electrical room, generator room, electrical closet, IT room;

1.1.7.6(2) Ground rods, buried cables, ground buses, ground cables;

1.1.7.6(3) Equipment shown in elevation;

1.1.7.6(4) Equipment shown on the floor level where they will be installed;

1.1.7.6(5) A two-dimensional relative representation of where the equipment will be located;

1.1.7.6(6) A two-dimensional representation of the routing of the cables; and

1.1.7.6(7) Equipment sizing.

1.1.7.7 Not in use.

1.1.7.8 Lighting Control Riser and Details will include:

1.1.7.8(1) The entire lighting control system;

1.1.7.8(2) Equipment shown on the floor level where they will be installed;

1.1.7.8(3) A two-dimensional relative representation of where the equipment will be located;

1.1.7.8(4) Wiring runs to equipment;

1.1.7.8(5) A two-dimensional representation of the routing of the wiring runs; and

1.1.7.8(6) Equipment names, following a consistent equipment naming methodology.

1.1.7.9 Not in use.

1.1.7.10 Other Systems Riser will include:

1.1.7.10(1) Riser diagram showing interconnections, or any other systems not shown on listed risers.

1.1.7.10(2) Equipment shown on the floor level where they will be installed;

1.1.7.10(3) A two-dimensional relative representation of where the equipment will be located;

1.1.7.10(4) Wiring runs to equipment;

1.1.7.10(5) A two-dimensional representation of the routing of the wiring runs; and

1.1.7.10(6) Equipment names, following a consistent equipment naming methodology.

1.1.7.11 Fire Alarm and Voice Communications System Riser Diagram will include:

1.1.7.11(1) The entire fire alarm and voice communication system;

1.1.7.11(2) Equipment shown on the floor level where they will be installed;

1.1.7.11(3) A two-dimensional relative representation of where the equipment will be located;

1.1.7.11(4) Communication wiring between the head end and local panels, and between local panels;

1.1.7.11(5) A two-dimensional representation of the routing of the wiring between the head end and the local panels and between the local panels;

1.1.7.11(6) Each detection loop out of a local panel, including every isolation module used in the loop;

1.1.7.11(7) Indication of each detection zone;

1.1.7.11(8) Indication of each monitoring zone;

1.1.7.11(9) Indication of each signal zone;

1.1.7.11(10) A typical representation of the detection, monitoring and control devices installed on each segment of a loop (i.e. between isolation modules);

1.1.7.11(11) Each signal circuit out of a local panel;

1.1.7.11(12) A typical representation of the signal devices installed on each signal circuit;

1.1.7.11(13) Interconnections with other systems; and

1.1.7.11(14) Equipment names, following a consistent equipment naming methodology.

1.1.7.12 Lighting and Lighting Control Plans will include:

1.1.7.12(1) Reflected ceiling plans to scale showing all luminaires, including emergency lighting and exit signs, in their relative locations;

1.1.7.12(2) An indication of the luminaire types, corresponding to the luminaire schedules;

1.1.7.12(3) Circuiting of each luminaire;

1.1.7.12(4) Lighting control devices, in their relative locations;

1.1.7.12(5) Full lighting and switching layout for each room and floor plates;

1.1.7.12(6) Control panels, in their relative locations;

1.1.7.12(7) Lighting control zoning;

1.1.7.12(8) Lighting panelboards, in their relative locations; and

1.1.7.12(9) Room names and numbers, doors and windows, corridor names.

1.1.7.13 Power Plans will include:

1.1.7.13(1) Floor plans to scale showing all;

1.1.7.13(1)a. receptacles;
1.1.7.13(1)b. outlets;
1.1.7.13(1)c. safety switches;
1.1.7.13(1)d. transfer switches;
1.1.7.13(1)e. dry type transformers;
1.1.7.13(1)f. feeders;
1.1.7.13(1)g. splitters;
1.1.7.13(1)h. distribution panels;
1.1.7.13(1)i. lighting/receptacle/lab panels;
1.1.7.13(1)j. timers;
1.1.7.13(1)k. contactors;
1.1.7.13(1)l. switchgear;
1.1.7.13(1)m. switchboards;
1.1.7.13(1)n. power factor correction units;
1.1.7.13(1)o. transformers;
1.1.7.13(1)p. generators;
1.1.7.13(1)q. motor control centres;
1.1.7.13(1)r. motor starters and VFSs
1.1.7.13(1)s. chillers;
1.1.7.13(1)t. motors over 25 HP;
1.1.7.13(1)u. automatic door controls;
1.1.7.13(1)v. equipment (other than lighting control), shown in their relative locations;
1.1.7.13(1)w. An indication of the equipment types, corresponding to the Legend;
1.1.7.13(1)x. Circuiting of each item of equipment; and
1.1.7.13(1)y. Room names and numbers, doors and windows, corridor names.

1.1.7.14 Fire Alarm and Voice Communications System Plans will include:

1.1.7.14(1) Reflected ceiling plans to scale showing all detection devices, signal devices, control devices, monitoring devices, isolation modules, in their relative locations;

1.1.7.14(2) An indication of the equipment types, corresponding to the Legend;

1.1.7.14(3) Annunciators, head end equipment, local panels, battery cabinets, paging stations, control centres, in their relative locations;

1.1.7.14(4) Identification of each zone boundary;

1.1.7.14(5) Room names and numbers, doors and windows, corridor names;

1.1.7.14(6) Zone numbers, and

1.1.7.14(7) Fire walls, fire separations.

1.1.7.15 Other Systems Plans will include:

1.1.7.15(1) Floor plans or reflected ceiling plans as required to show any equipment not shown on other plans.

1.1.7.16 Fire Alarm and Voice Communications Systems Schedules will include:

1.1.7.16(1) All detection, monitoring and control zone designations;

1.1.7.16(2) All signal zone designations;

1.1.7.16(3) A description of the area or equipment involved;

1.1.7.16(4) An indication of the system operation related to that zone;

1.1.7.16(5) All paging zone designations; and

1.1.7.16(6) A description of the area involved for each paging zone.

1.1.7.17 Site Service Details will include:

1.1.7.17(1) Pad Mounted Transformer;

1.1.7.17(2) Maintenance holes and hand holes;

1.1.7.17(3) Cable racking inside maintenance holes;

1.1.7.17(4) Cable pulling provisions inside maintenance holes;

1.1.7.17(5) Built in ladders inside maintenance holes;

1.1.7.17(6) Means of draining maintenance holes including gravity drainage and sump pump systems;

1.1.7.17(7) Lighting and power provisions inside maintenance holes;

1.1.7.17(8) Cross sections of each duct bank;

1.1.7.17(9) Cross sections of any direct buried cables;

1.1.7.17(10) Bases for lighting standards;

1.1.7.17(11) Bases for bollards; and

1.1.7.17(12) Bases for other equipment.

1.1.7.18 Miscellaneous Details will include:

1.1.7.18(1) All details required for the full description of the project not included on other drawings.

1.1.7.19 All other drawings will include:

1.1.7.19(1) Drawings as required for the full description of the project not included on other drawings.

1.1.7.20 Record Drawings will include:

1.1.7.20(1) Drawings included in the 100% submission plus any changes made and any drawings added up to the completion of Construction;

1.1.7.20(2) Updating of each drawing to the final "as built" condition;

1.1.7.20(3) Final locations of duct banks, maintenance holes, hand holes, conduit, outlets, panels, branch wiring, system wiring, pull boxes, bus ducts, and equipment;

1.1.7.20(4) Dimensions from column lines or edge of roadways to the location of buried services; and

1.1.7.20(5) Project surveyor's information on the site services as-built drawings.

1.1.7.21 Electrical Specifications will include:

1.1.7.21(1) Sections in sufficient detail to unequivocally describe each material and each item of equipment to be used on the electrical scope of work for the project;

1.1.7.21(2) The method of installation, testing, commissioning, and documenting for each material, item of equipment, and system that is part of the electrical scope of work for the project; and

1.1.7.21(3) Identification of the codes and standards that the materials, equipment, and systems will be provided in accordance with.

1.1.7.22 Branch Circuit Panelboard Schedules will include:

1.1.7.22(1) A separate schedule for each panelboard;

1.1.7.22(2) Panelboard ratings, voltage, and ampacity;

1.1.7.22(3) Main breaker ratings (where applicable);

1.1.7.22(4) Maximum number of branch breaker poles that the panelboard can accommodate;

1.1.7.22(5) The rating and number of poles for each branch breaker;

1.1.7.22(6) The phase that each breaker pole is connected to;

1.1.7.22(7) The name of the load supplied by each branch breaker;

1.1.7.22(8) The anticipated circuit loading in Amperes;

1.1.7.22(9) Spare breakers;

1.1.7.22(10) Breaker spaces;

1.1.7.22(11) The interrupting rating of the circuit breakers; and

1.1.7.22(12) Circuits equipped with breaker "lock-on" devices.

1.1.7.23 Lighting Control Schedules will include:

1.1.7.23(1) A separate schedule for each control panel;

1.1.7.23(2) Lighting control zone designations;

1.1.7.23(3) Circuits and sub-circuits controlled;

1.1.7.23(4) Designation of each control relay;

1.1.7.23(5) Rating of each control relay;

1.1.7.23(6) A description of the type of control;

1.1.7.23(7) A listing of "scenes" allocated to the zone; and

1.1.7.23(8) Interfaces with other panels, head end equipment, other systems.

1.1.7.24 Communications Specifications Sections will include:

1.1.7.24(1) Not in use.

1.1.7.24(2) The method of installation, testing, commissioning, and documenting for each material, item of equipment, and system that is part of the electrical scope of work for the project; and

1.1.7.24(3) Identification of the codes and standards that the materials, equipment, and systems will be provided in accordance with.

1.1.7.25 Electronic Safety and Security Specifications Sections will include:

1.1.7.25(1) Sections in sufficient detail to unequivocally describe each material and each item of equipment to be used on the fire alarm and voice communication system, fuel leakage detection systems and water detection systems, under the electrical scope of work for the project;

1.1.7.25(2) The method of installation, testing, commissioning, and documenting for each material, item of equipment, and system that is part of the electrical scope of work for the project; and

1.1.7.25(3) Identification of the codes and standards that the materials, equipment, and systems will be provided in accordance with.

1.1.7.26 Calculations will be:

1.1.7.26(1) Published, hand written calculations will not be submitted;

1.1.7.26(2) Fully detailed to allow review of each step of the calculations;

1.1.7.26(3) With power demand and diversity factors identified; and

1.1.7.26(4) With all assumptions clearly stated.

1.1.7.27 Total Load Calculations (utility electric service) will include:

1.1.7.27(1) Calculation of the annual peak demand load, in kW and kVA, expected for the Facility;

1.1.7.27(2) Calculation of the annual peak demand load, in kW and kVA, on the utility service in kW under typical operating conditions, also indicating the spare capacity is available;

1.1.7.27(3) not used; and

1.1.7.27(4) Electrical load redundancy and spare capacity calculations for all normal power identifying loads of different types, such as individual mechanical equipment, lighting, general receptacles, communications and security equipment and elevators.

1.1.7.28 Total Load Calculations (generator power) will include:

1.1.7.28(1) Calculation of the annual peak demand load on the generating system, in kW and kVA, expected for the Facility to be used to size the mobile Load Bank;

1.1.7.28(2) Calculation of the annual peak demand load, in kW and kVA, on each generator under typical operating conditions, indicating the spare capacity on each generator;

1.1.7.28(3) Calculation of the annual peak demand load, in kW and kVA, on each generator with one generator out of service;

1.1.7.28(4) Calculation of the annual peak demand load, in kW and kVA, on each generator with one generator bus (i.e. two generators) out of service; and

1.1.7.28(5) Electrical load redundancy and spare capacity calculations for all branches of power identifying loads of different types, such as individual mechanical equipment, lighting, general receptacles, communications and security equipment and elevators.

1.1.7.29 Load Calculations (transformer loadings) will include:

1.1.7.29(1) Calculation of the annual peak demand load, in kW and kVA, on each transformer under typical operating conditions;

1.1.7.30 Load Calculations (generator loadings) will include:

1.1.7.30(1) Calculation of the annual peak demand load, in kW and kVA, on each generator under typical operating conditions;

1.1.7.30(2) Calculation of the annual peak demand load, in kW and kVA, on each generator with one generator out of service, the generator out of service to be one that causes load to be transferred to the generator for which the load calculation is being performed (i.e. its twin);

1.1.7.30(3) Calculation of the anticipated future load growth on each generator;

1.1.7.30(4) Calculation of the spare capacity provided for in each generator;

1.1.7.30(5) Electrical load redundancy and spare capacity calculations for all branches of power identifying loads of different types, such as individual mechanical equipment, lighting, general receptacles, communications and security equipment and elevators; and

1.1.7.30(6) Calculation of the annual peak demand load on the generating system, in kW and kVA, expected for the Facility to be used to size the permanent Load Bank.

1.1.7.31 Load Calculations (UPS power) will include:

1.1.7.31(1) Calculation of the annual peak demand load, in kW and kVA, on the UPS system under typical operating conditions;

1.1.7.31(2) Calculation of the anticipated future load growth on the UPS system;

1.1.7.31(3) Calculation of the spare capacity provided for in the UPS system; and

1.1.7.31(4) Calculation of the battery support time of the UPS system, based on:

1.1.7.31(4)a. full load operation;

1.1.7.31(4)b. not used;

1.1.7.31(4)c. with the battery capacity derated to the actual ambient room temperature; and

1.1.7.31(4)d. not used."

1.1.7.32 Not used.

1.1.7.33 Voltage Drop calculations will include:

1.1.7.33(1) Calculations of the steady state voltage drop from the utility service though to every power utilizing device;

1.1.7.33(2) Provided that a maximum of 2% voltage drop is allowed for to each branch circuit panelboard, CDP or MCC, then the voltage drop calculations can end at the final branch circuit panelboard, CDP or MCC;

1.1.7.33(3) Calculations based on a load equal to 80% of the breaker or fuse rating protecting the circuit, unless the load is fixed and known (e.g.: a single motor) in which case the fixed known load can be used; and

1.1.7.33(4) Calculations based on a power factor of 90% unless a different power factor is known to apply in which case the known power factor is to be used.

1.1.7.34 Short Circuit calculations will include:

1.1.7.34(1) Calculations of symmetrical and asymmetrical values of fault currents, based on the calculated X/R ratio of the system;

1.1.7.34(2) Calculations of the maximum three phase fault current, the maximum line to line fault current, the maximum line to ground fault current and the minimum line to ground fault current at every protective device and switching device in the electrical system, excluding local switches on branch circuits;

1.1.7.34(3) The maximum fault currents based on the utility supply in parallel with the generator supply, where closed transition transfer switches are used;

1.1.7.34(4) The utility ultimate design fault levels;

1.1.7.34(5) Motor contribution; and

1.1.7.34(6) Actual transformer impedances, but until actual impedances are available, worst case (low) impedances.

1.1.7.35 Arc Flash calculations will include:

1.1.7.35(1) Calculations of the arc flash level at every protective device and every switching device in the system, excluding local switches on branch circuits.

1.1.7.36 Coordination Study will include:

1.1.7.36(1) Graphs of each portion of the electrical system on log-log paper showing:

1.1.7.36(1)a. The operating characteristics of each protective device;

1.1.7.36(1)b. Full load ratings of transformers;

1.1.7.36(1)c. Full load ratings of individual generators and generators in parallel;

1.1.7.36(1)d. The maximum and minimum fault level at each protective device and each switching device;

1.1.7.36(1)e. Transformer inrush current;

1.1.7.36(1)f. Full load ratings of generators;

1.1.7.36(2) Schedules showing each protective device that is equipped with an adjustable trip unit, showing the device frame size, CT ratios and the detailed settings of its trip unit,

1.1.7.36(3) Identification of areas where equipment protection is not adequate; and

1.1.7.36(4) Identification of areas where full co-ordination is not achieved.

1.1.7.37 Lighting calculations will include:

1.1.7.37(1) Calculation of the average illumination in each area and room;

1.1.7.37(2) Calculation of the max to min ratio in each area and room;

1.1.7.37(3) Identification of the light loss factors and dirt depreciation factors used in the calculations, and the supporting justification for them;

1.1.7.37(4) Identification of the floor, wall and ceiling reflectance values used and the source of these values; and

1.1.7.37(5) Dimensions of each space and the source of these values.

1.1.7.38 Not in use.

1.1.8 Electrical Shop Drawings

1.1.8.1 Submit shop drawings for the following:

1.1.8.1(1) Co-ordination drawings;

1.1.8.1(2) Detailed installation drawings;

1.1.8.1(3) Documents supporting LEED application;

1.1.8.1(4) Single line diagrams;

1.1.8.1(5) Fire alarm riser diagram;

1.1.8.1(6) Fire alarm zoning plans;

1.1.8.1(7) Nameplate wording;

1.1.8.1(8) Warning signs;

1.1.8.1(9) Labels;

1.1.8.1(10) Access doors;

1.1.8.1(11) Fire stopping:

1.1.8.1(11)a. Technical data;
1.1.8.1(11)b. ULC or CUL listing;
1.1.8.1(11)c. Supports and bases; and
1.1.8.1(11)d. Insert drawings.

1.1.8.1(12) Low voltage cables;

1.1.8.1(13) Grounding:

1.1.8.1(13)a. System design; and
1.1.8.1(13)b. Materials.

1.1.8.1(14) Splitters and cabinets;

1.1.8.1(15) Junction boxes with L, W or H larger than 600;

1.1.8.1(16) Cable tray;

1.1.8.1(17) Wireways;

1.1.8.1(18) Duct banks:

1.1.8.1(18)a. Design;
1.1.8.1(18)b. Materials; and
1.1.8.1(18)c. Spacers.

1.1.8.1(19) Vibration isolation and seismic restraint:

1.1.8.1(19)a. Design;
1.1.8.1(19)b. Materials;

1.1.8.1(20) Maintenance holes;

1.1.8.1(21) Hand holes;

1.1.8.1(22) Pull pits;

1.1.8.1(23) Pad mounted transformer bases;

1.1.8.1(24) Lighting control systems:

1.1.8.1(24)a. System description;
1.1.8.1(24)b. Schematic diagrams;
1.1.8.1(24)c. Wiring diagrams;
1.1.8.1(24)d. Components;
1.1.8.1(24)e. Ratings; and
1.1.8.1(24)f. Operating schedules.

1.1.8.1(25) Dry type transformers:

1.1.8.1(25)a. Design;
1.1.8.1(25)b. Ratings;
1.1.8.1(25)c. Schematics;
1.1.8.1(25)d. CSA nameplates;
1.1.8.1(25)e. Accessories;
1.1.8.1(25)f. Enclosures; and

1.1.8.1(25)g. High resistance grounding systems.

1.1.8.1(26) Low voltage switchboards:

1.1.8.1(26)a. Design;
1.1.8.1(26)b. Ratings;
1.1.8.1(26)c. Schematics;
1.1.8.1(26)d. Three wire diagrams;
1.1.8.1(26)e. Subassemblies (e.g. circuit breakers, trip units, metering units, grounding systems);
1.1.8.1(26)f. Controls; and
1.1.8.1(26)g. Enclosures.

1.1.8.1(27) Panelboards:

1.1.8.1(27)a. Design;
1.1.8.1(27)b. Ratings;
1.1.8.1(27)c. Breaker complement;
1.1.8.1(27)d. Breaker ratings;
1.1.8.1(27)e. Spares and spaces;
1.1.8.1(27)f. Accessories; and
1.1.8.1(27)g. Enclosures.

1.1.8.1(28) Wiring devices;

1.1.8.1(29) Disconnect switches;

1.1.8.1(30) Contactors;

1.1.8.1(31) Starters;

1.1.8.1(32) Motor control centres:

1.1.8.1(32)a. Design;
1.1.8.1(32)b. Ratings;
1.1.8.1(32)c. Schematics;
1.1.8.1(32)d. Subassemblies (e.g. starters, metering units, transformers, panelboards);
1.1.8.1(32)e. Controls; and
1.1.8.1(32)f. Enclosures,

1.1.8.1(33) Harmonic filters:

1.1.8.1(33)a. Design;
1.1.8.1(33)b. Ratings;
1.1.8.1(33)c. Schematics;
1.1.8.1(33)d. Harmonic current mitigation performance; and
1.1.8.1(33)e. Enclosures.

1.1.8.1(34) Electric pipe heating:

1.1.8.1(34)a. Components; and
1.1.8.1(34)b. Controller.

1.1.8.1(35) Electric space heating,

1.1.8.1(36) Generators:

1.1.8.1(36)a. Design;

1.1.8.1(36)b. Ratings;

1.1.8.1(36)c. Schematics;

1.1.8.1(36)d. Three wire diagrams;

1.1.8.1(36)e. Subassemblies (e.g. engine, radiator, alternator, voltage regulators, governor, base, heaters, fuel pumps, fuel filters, fuel coolers, vibration isolators, controls, metering units, circuit breakers, silencers, starting battery, battery charger);

1.1.8.1(36)f. Paralleling controls;

1.1.8.1(36)g. Load Management System; and

1.1.8.1(36)h. Overall assembly.

1.1.8.1(37) Harmonic cancellation transformers:

1.1.8.1(37)a. Design;

1.1.8.1(37)b. Ratings;

1.1.8.1(37)c. Schematics;

1.1.8.1(37)d. Harmonic current mitigation performance;

1.1.8.1(37)e. CSA nameplates;

1.1.8.1(37)f. Accessories; and

1.1.8.1(37)g. Enclosures.

1.1.8.1(38) Power factor correction units:

1.1.8.1(38)a. Design;

1.1.8.1(38)b. Ratings;

1.1.8.1(38)c. Schematics;

1.1.8.1(38)d. Harmonic current mitigation performance;

1.1.8.1(38)e. Subassemblies (e.g. tanks, harmonic filters, automatic controller, metering);

1.1.8.1(38)f. Accessories; and

1.1.8.1(38)g. Enclosures.

1.1.8.1(39) Transfer switches:

1.1.8.1(39)a. Design;

1.1.8.1(39)b. Ratings;

1.1.8.1(39)c. Schematics;

1.1.8.1(39)d. Three wire diagrams;

1.1.8.1(39)e. Subassemblies (e.g.: circuit breakers, relays, metering units);

1.1.8.1(39)f. Controls;

1.1.8.1(39)g. Interlocks; and

1.1.8.1(39)h. Enclosures.

1.1.8.1(40) Lightning protection:

1.1.8.1(40)a. System design;

1.1.8.1(40)b. Materials; and

1.1.8.1(40)c. Components.

1.1.8.1(41) Surge protective devices:

1.1.8.1(41)a. Design;
1.1.8.1(41)b. Ratings;
1.1.8.1(41)c. Schematics;
1.1.8.1(41)d. Alarm contacts, meters, and indicators; and
1.1.8.1(41)e. Enclosures.

1.1.8.1(42) Lighting:

1.1.8.1(42)a. each type of luminaire; and
1.1.8.1(42)b. each type of illuminated sign.

1.1.8.1(43) Battery lighting equipment:

1.1.8.1(43)a. Design;
1.1.8.1(43)b. Illumination levels;
1.1.8.1(43)c. Batteries;
1.1.8.1(43)d. Battery capacity;
1.1.8.1(43)e. Alarm contacts, and indicators;
1.1.8.1(43)f. Lighting heads and remote heads;
1.1.8.1(43)g. Enclosures;

1.1.8.1(44) Clock System:

1.1.8.1(44)a. System design;
1.1.8.1(44)b. Components; and
1.1.8.1(44)c. Accessories.

1.1.8.1(45) Interval timers; and

1.1.8.1(46) Fire alarm system:

1.1.8.1(46)a. System design;
1.1.8.1(46)b. Riser diagram;
1.1.8.1(46)c. Schematics; and
1.1.8.1(46)d. Components.
1.1.8.1(46)e. Batteries;
1.1.8.1(46)f. Battery calculations (support time);
1.1.8.1(46)g. Power supply calculations;
1.1.8.1(46)h. Amplifier calculations;
1.1.8.1(46)i. Wiring;
1.1.8.1(46)j. Zoning;
1.1.8.1(46)k. Zone isolation;
1.1.8.1(46)l. Enclosures; and
1.1.8.1(46)m. Accessories;

1.1.9 Not in use.

1.1.10 Not in use

1.1.10.1 Submit documentation of the following studies:

1.1.10.1(1) RF study of the property;

1.1.10.1(2) Short circuit studies;

1.1.10.1(3) Protective device coordination studies; and

1.1.10.1(4) Arc flash studies.

1.1.11 Electrical Reports

1.1.11.1 Submit reports for the following:

1.1.11.1(1) Operating and Maintenance Manuals;

1.1.11.1(2) Training session records;

1.1.11.1(3) Panelboard loading test results;

1.1.11.1(4) Transformer loading test results;

1.1.11.1(5) Motor control centre loading test results;

1.1.11.1(6) Motor control centre performance testing;

1.1.11.1(7) Seismic restraints;

1.1.11.1(8) Illumination level measurements;

1.1.11.1(9) Factory witness testing;

1.1.11.1(10) Site acceptance (pre-service) testing;

1.1.11.1(11) Lightning protection grounding resistance;

1.1.11.1(12) Generator testing;

1.1.11.1(13) Transfer switch testing;

1.1.11.1(14) Transformer testing;

1.1.11.1(15) Switchgear/switchboard testing;

1.1.11.1(16) Distribution system dynamic performance verification;

1.1.12 Electrical Certificates and Verifications

1.1.12.1 Submit the following certificates and verifications:

1.1.12.1(1) Manufacturers' letters verifying that the equipment has been installed in accordance with their instructions for the following:

1.1.12.1(1)a. Fire stopping;
1.1.12.1(1)b. Fire rated wiring;
1.1.12.1(1)c. Lighting control systems;
1.1.12.1(1)d. Clock system;
1.1.12.1(1)e. Automatic transfer switches;
1.1.12.1(1)f. Generators;
1.1.12.1(1)g. UPS systems;
1.1.12.1(1)h. UPS batteries;
1.1.12.1(1)i. Power factor correction units; and
1.1.12.1(1)j. Pipe heating systems.

1.1.12.1(2) Seismic certifications:

1.1.12.1(2)a. Transformers;
1.1.12.1(2)b. Diesel generators;
1.1.12.1(2)c. Transfer switches; and
1.1.12.1(2)d. Switchgear/switchboards.

1.1.12.1(3) Seismic restraints;

1.1.12.1(4) Fire alarm system verification;

1.1.12.1(5) Request for final review; and

1.1.12.1(6) Equipment warranties.

1.1.13 Telecommunications Design Submittals

1.1.13.1 Within section 2.8.12, the term "system(s)" or "System(s)" will refer to all systems provided by Communications (Division 27).

1.1.13.2 Telecommunications drawings will be identified as "T" series (Telecommunications) drawings in the approved construction drawings, separated from "E" (Electrical) drawings. The T-series drawings at will include those referenced in 2.8.12.3 below :

1.1.13.3 Telecommunication Documents

Percentage Complete at Submission Stages	30%	60%	95%	100%	Record Drawing
Drawing Content					
Legends, drawing list, key plans	✔	✔	✔	✔	✔
Telecom Site Plan	✔	✔	✔	✔	✔
Communications Floor Plans	✔	✔	✔	✔	✔
Systems Floor Plans	✔	✔	✔	✔	✔
Communications Room Layouts and Elevations	-	✔	✔	✔	✔
Equipment Rack Layouts	-	✔	✔	✔	✔
Systems Integration Schematics	-	✔	✔	✔	✔
Telecommunications Bonding and Grounding System	-	✔	✔	✔	✔
Backbone Riser Diagrams	✔	✔	✔	✔	✔
A/V and Teleconference Room Layouts, Elevations and Reflected Ceiling Plans	-	✔	✔	✔	✔
IMIT Systems Integration Diagram	-	✔	✔	✔	✔
Riser Diagrams (All Div.27 Systems)	✔	✔	✔	✔	✔
Specifications					
Communications (Division (27)	✔	✔	✔	✔	-
Other Submittals					
Communications (Division 27)	-	-	✔	✔	-
Public address sound coverage and clarity (dBA and STI)	-	✔	✔	✔	✔
Wireless network heat maps in 2.4GHz and 5GHz	-	✔	✔	✔	✔

1.1.13.4 Construction Drawings

1.1.13.4(1) All drawings, specifications, submittals, and Design Submittals will be produced and reviewed and stamped by the Registered Communications Distribution Designer (RCDD) employed by the Design-Builder;

1.1.13.4(2) Telecom Site Plan will include:

1.1.13.4(2)a. Telecom duct bank routing plan from service provider pole to the Facility;

1.1.13.4(2)b. Section views of the duct including dimensions and clearances from other utilities.

1.1.13.4(3) Communications Floor Plans will indicate:

1.1.13.4(3)a. The locations of all Communications Rooms and their associated serving zone boundaries;

1.1.13.4(3)b. All telecommunications outlets (ceiling, floor, wall or other) identifying types of cables, label details and number of cable drops per outlet;

1.1.13.4(3)c. Locations, quantity and sizes of all low voltage conduits, raceways, cable tray, sleeves, junction boxes and pull boxes;

1.1.13.4(3)d. Cable tray fill calculations; and

1.1.13.4(3)e. Backbone cabling routes including the routes of the telecommunications grounding backbone.

1.1.13.4(4) Systems Floor Plans will include:

1.1.13.4(4)a. Reflected ceiling plans showing locations of all ceiling mounted devices;

1.1.13.4(4)b. Zoning areas including, but not limited to, PA systems;

1.1.13.4(4)c. Floorplans identifying all wall and floor mounted devices of each system;

1.1.13.4(4)d. Locations of head-end equipment.

1.1.13.4(5) Communications Room Layouts and Elevations will:

1.1.13.4(5)a. be provided in 2D and 3D;

1.1.13.4(5)b. be to scale providing detail plan views, reflected ceiling plans and elevations of all communications and low voltage components and equipment, racks and enclosures;

1.1.13.4(5)c. show maintenance and operational clearances.

1.1.13.4(5)d. show non-telecom related materials, equipment, devices, and structures (all dimensions are to be included). This includes, but is not limited to, electrical distribution (panels and receptacles) and lighting fixtures, locations and sizes of all pathways (sleeves, conduits, entrance ducts, cable tray), grounding busbar, backboards, mechanical ducting and equipment, fire detection and suppression systems and security, BMS, public address and audio visual/video conferencing equipment.

1.1.13.4(5)e. show elevation drawings of all walls of each telecommunications equipment room, clearly showing the layout of all termination hardware, grounding & bonding components, horizontal pathway penetrations, and wall mounted equipment cabinets.

1.1.13.4(5)f. show high voltage gear situated adjacent to Communications Rooms with clearance elements of telecom items from all such objects.

1.1.13.4(6) Rack Layouts will include:

1.1.13.4(6)a. detailed elevation drawings of equipment layout in each floor or wall mounted equipment rack and cabinet in Communications Rooms; Elevation drawings will include vertical and horizontal wire managers, fibre and copper patch panels, hardware such as shelves and all active equipment regardless of the supplier;

1.1.13.4(7) Intrabuilding-Backbone Pathways will include:

1.1.13.4(7)a. Telecommunications Bonding and Grounding System;

1.1.13.4(7)b. Backbone pathway systems including service entrances, identifying quantity and sizes of conduits, trays, and sleeves.

1.1.13.4(8) Intrabuilding-Backbone Cabling will include:

1.1.13.4(8)a. All backbone cabling, cross connect locations and type, size, sheath, gauge, length, and strands of each copper and fibre cable installed.

1.1.13.4(9) Systems Integration Schematics will include:

1.1.13.4(9)a. Integration diagrams showing the medium type (i.e. fibre, cat6, etc.…) and protocol used for integration between all systems, Division 28, the Owner Network, and other networks.

1.1.13.4(10)Audio Visual and Teleconferencing

1.1.13.4(10)a. Floor layouts of each multimedia and/or teleconference room identifying quantities and types of cables, endpoint locations, pathways, floor box locations.

1.1.13.4(10)b. Elevation layouts of each multimedia and/or teleconference room identifying locations of all power/data outlets, wall backing for equipment mounts, locations for display screens, control panels and switches, source connection patch panels, cameras, speakers, and other AV components.

1.1.13.4(10)c. Reflected ceiling plans of each multimedia and/or teleconference room identifying location of ceiling mounted A/V equipment including projectors, motorized screens, speakers, microphones, and other ceiling devices including sprinkler heads, lighting fixtures, sensors, vents, grilles.

1.1.13.5 Submittals

1.1.13.5(1) The purpose of shop drawing submittals is to demonstrate the Design- Builder's understanding of the design intent. This understanding is demonstrated by articulating which equipment and material is required, and by what methods of fabrication and installation will be utilized;

1.1.13.5(2) Before installation of any cable, structured cabling component, pathway, firestop assembly or related material, equipment or hardware, the Design-builder will provide submittal of shop drawings and product data sheets for each component supplied to the Owner;

1.1.13.5(3) Shop drawings and product data sheets will indicate operating characteristics for each required item and design conditions;

1.1.13.5(4) Shop drawing and product data will include, but is not limited to the following:

1.1.13.5(4)a. Copper Cabling;

1.1.13.5(4)b. Fibre Cabling;

1.1.13.5(4)c. Coaxial Cabling;
1.1.13.5(4)d. Fibre Connector Housings;
1.1.13.5(4)e. Faceplates;
1.1.13.5(4)f. Floorboxes;
1.1.13.5(4)g. Patch Panels;
1.1.13.5(4)h. (AV) Source Connection Panels;
1.1.13.5(4)i. 110 Punch Block System (GigaBIX);
1.1.13.5(4)j. Jacks/Inserts;
1.1.13.5(4)k. Fibre Connectors;
1.1.13.5(4)l. Equipment Racks, Cabinets and Enclosures;
1.1.13.5(4)m. Vertical and Horizontal Cable Management;
1.1.13.5(4)n. Cable Tray;
1.1.13.5(4)o. Firestop Details (Product and System Number);
1.1.13.5(4)p. Telecommunications Bonding and Grounding System Materials;
1.1.13.5(4)q. CATV/Broadband Distribution System Cable, Components and Connectors;
1.1.13.5(4)r. Overhead Paging System Cable, Equipment (paging amplifiers, speakers, power supplies and other support equipment) and Connectors;
1.1.13.5(4)s. All system equipment and components;
1.1.13.5(4)t. Intercommunication Systems Cable, Components and Connectors; and

1.1.13.5(5) The submittals will be reviewed for general compliance and not for dimensions and quantities. The submittal review will not relieve the Design-Builder of responsibility for errors or omissions and deviations from the requirements outlined in this Design-Build Agreement. If the submittal shows variations from the requirements of the this Design-Build Agreement for any reason, the Design-Builder will provide written detail of each variation in the letter of transmittal; and

1.1.13.5(6) Shop Drawings will be submitted in an electronic format. The file format will be Adobe portable data file (.pdf) or provide software to enable viewing of files of the other formats at no additional cost to the Owner.

1.1.13.6 As-Built Documentation

1.1.13.6(1) The Design-Builder will provide Maintenance Manual at a minimum contain the following:

1.1.13.6(1)a. Set of final reviewed Shop Drawings;
1.1.13.6(1)b. A copy of all as-built drawings;
1.1.13.6(1)c. Digital photos of all Communications Rooms showing each wall and rack elevations.
1.1.13.6(1)d. Circuit Spreadsheets for horizontal cabling and fibre backbone;
1.1.13.6(1)e. Manufacturer Warranty documents for equipment and workmanship;
1.1.13.6(1)f. Copper Warranty Certification test result printout;
1.1.13.6(1)g. Optical fibre power metre/light source test result printouts;
1.1.13.6(1)h. Fire-stop design and records documentation;
1.1.13.6(1)i. WiFi heat mapping reports;
1.1.13.6(1)j. Public Address sound quality and coverage report; and

1.1.13.6(1)k. Names, addresses, phone numbers and facsimile numbers of the Design-Builder, Design-Builder's RCDD, sub-contractors and suppliers used on the Work together with a specification reference of the portion of the Work they undertook.

1.1.14 Electronic Security Systems Design Submittals

1.1.14.1 CCTV camera coverage including graphical representation of the horizontal pixels per meter of and view range of all cameras. The simulation should not allow camera views to "bleed" through solid objects. The simulation will incorporate camera height and tilt angles.

1.1.14.2 Electronic Security System drawings will be included and identified as "T" series (Telecommunications) drawings in the approved construction drawings, separated from "E" (Electrical) drawings. The Electronic Security System will at minimum the following "T" series drawings:

Percentage Complete at Submission Stages	30%	60%	95%	100%	As-Built
Drawing Content					
Legends, drawing list, key plans	✔	✔	✔	✔	✔
Electronic Security Floor Plans	✔	✔	✔	✔	✔
Electronic Security Riser Diagrams	✔	✔	✔	✔	✔
Equipment Rack Layouts & Elevations	-	✔	✔	✔	✔
Specifications					
Electronic Security (Division 28)	-	-	✔	✔	-
1.1.14.3 Provide separate reports using computer simulation software to verify system design..	-	✔	✔	✔	✔

1.1.14.4 Construction Drawings

1.1.14.4(1) The drawings will use industry standard symbols and legends;

1.1.14.4(2) Security Floor Plans will include:

1.1.14.4(2)a. Locations, quantity and types of all devices, components and equipment required for the Electronic Security Systems (Division 28);

1.1.14.4(2)b. Security zoning (interior and exterior);

1.1.14.4(2)c. Locations, quantity and sizes of all low voltage conduits, raceways, cable tray, sleeves, junction boxes and pull boxes;

1.1.14.4(2)d. Location of head-end equipment and storage; and

1.1.14.4(2)e. CCTV camera view range and associated horizontal pixels per meter.

1.1.14.4(3) Electronic Security Riser Diagrams will include:

1.1.14.4(3)a. Riser diagrams for each system part of Electronic Security System (Division 28) , including cabling and device quantities and labels.

1.1.14.4(4) Equipment Rack Layouts & Elevations will include:

1.1.14.4(4)a. Detailed elevation drawings of Electronic Security System (Division 28) equipment installed in racks and cabinets. Elevation drawings will include vertical and horizontal wire managers, fibre and copper patch panels, hardware such as shelves and all active equipment regardless of the supplier;

1.1.14.4(5) Security Integration and Wiring Schematics will include:

1.1.14.4(5)a. Control layout, including interconnections between Electronic Security Systems, Division 27, Division 8, and Owner's Network.

1.1.14.4(6) Overall system riser wiring diagram identifying control units, circuits, terminations, terminal numbers, conductors, and raceways;

1.1.14.4(7) Access Control Door Details will include:

1.1.14.4(7)a. Detailed elevation diagrams of each side of each different access controlled door in the Facility which includes:

1.1.14.4(7)a.1 All access control equipment;
1.1.14.4(7)a.2 Locations and references to all Division 26 supplied power, equipment, and integration;
1.1.14.4(7)a.3 Locations and references to all Division 27 supplied equipment and integration;
1.1.14.4(7)a.4 Locations and references to all Division 8 supplied hardware, equipment, and integration;
1.1.14.4(7)a.5 Conduit, junction boxes, and cabling

1.1.14.5 Submittals

1.1.14.5(1) The purpose of shop drawing submittals is to demonstrate the Design- Builder's understanding of the design intent. This understanding is demonstrated by articulating which equipment and material is required, and by what methods of fabrication and installation will be utilized;

1.1.14.5(2) Before installation of any device, cable, component, pathway, or related material, equipment or hardware, the Design-builder will provide shop drawings and product data sheets submittal for each component supplied to the Owner.

1.1.14.5(3) Shop drawings and product data sheets will indicate operating characteristics for each required item and design conditions;

1.1.14.5(4) Shop drawing and product data will include, but is not limited to the following:

1.1.14.5(4)a. Access Control:

1.1.14.5(4)a.1 All devices and components;
1.1.14.5(4)a.2 Door controllers;
1.1.14.5(4)a.3 Field panels;
1.1.14.5(4)a.4 Interfaces to other systems; and
1.1.14.5(4)a.5 Power Supplies.

1.1.14.5(4)b. Video Surveillance:

1.1.14.5(4)b.1 All devices and components;
1.1.14.5(4)b.2 Cameras;
1.1.14.5(4)b.3 Power Supplies;
1.1.14.5(4)b.4 Monitors, keyboards, and controllers;

1.1.14.5(4)b.5 Interfaces to other system; and
1.1.14.5(4)b.6 Storage.

1.1.14.5(4)c. Intrusion Detection:
1.1.14.5(4)c.1 All devices and components;
1.1.14.5(4)c.2 Panels;
1.1.14.5(4)c.3 Keypads; and
1.1.14.5(4)c.4 Interfaces to other systems.

1.1.14.5(4)d. Panic/Duress System
1.1.14.5(4)d.1 All devices and components;
1.1.14.5(4)d.2 Pendants;
1.1.14.5(4)d.3 Transmitters/receivers/transceivers;
1.1.14.5(4)d.4 Fixed buttons & station;
1.1.14.5(4)d.5 Panels; and
1.1.14.5(4)d.6 Interfaces to other systems.

1.1.14.5(4)e. All other Electronic Security System
1.1.14.5(4)e.1 All devices and components;
1.1.14.5(4)e.2 Panels; and
1.1.14.5(4)e.3 Interfaces to other systems.

1.1.14.5(5) The submittals will be reviewed for general compliance and not for dimensions, quantities. The submittals that are returned will be used for procurement. The responsibility of correct procurement remains solely with the Design-Builder. The submittal review will not relieve the Design-Builder of responsibility for errors or omissions and deviations from this Design-Build Agreement;

1.1.14.5(6) Equipment and material substitutions are prohibited, unless approved by the Owner. If the submittal shows variations from the requirements of this Design-Build Agreement for any reason, the Design-Builder will provide written detail of each variation in the letter of transmittal; and

1.1.14.5(7) Shop Drawings will be submitted in an electronic format on USB Memory Key. The file format will be Adobe portable data file (.pdf) or provide software to enable viewing of files of the other formats at no additional cost to the Owner.

1.1.14.6 As-Built Documentation

1.1.14.6(1) At a minimum, the as-built drawing package supplied by the Design-Builder will include all information per the IFC and any additions made during construction;

1.1.14.6(2) The Design-Builder will provide Maintenance Manual at a minimum contain the following:

1.1.14.6(2)a. Set of final reviewed Shop Drawings;
1.1.14.6(2)b. A copy of all as-built drawings;
1.1.14.6(2)c. Digital photos of all Electronic Security System equipment installed in racks or cabinets;
1.1.14.6(2)d. Manufacturer Warranty documents for equipment and workmanship;
1.1.14.6(2)e. Testing and commissioning results;
1.1.14.6(2)f. Fire-stop design and records documentation;
1.1.14.6(2)g. Computer simulated CCTV coverage report; and

1.1.14.6(2)h. Names, addresses, phone numbers and facsimile numbers of the Design-Builder, sub-contractors and suppliers used on the Work together with a specification reference of the portion of the Work they undertook.

1.1.15 Landscape Design Submittals

Percentage Complete at Submission Stages	30%	60%	95%	100%	Record Drawing
Drawing Content					
Layout and Site Grading Plan	✔	✔	✔	✔	✔
Secured Outdoor Space Plan	✔	✔	✔	✔	✔
Irrigation Plan	-	✔	✔	✔	✔
Planting Plan	-	✔	✔	✔	✔
Landscape Details and Specifications	-	✔	✔	✔	✔
Sun/Shade Gardens	✔	✔	✔	✔	✔
Garden Enlargement Plans	-	✔	✔	✔	✔
Specifications					
General Requirements	✔	✔	✔	✔	-
Equipment	-	✔	✔	✔	-
Furnishings	-	✔	✔	✔	-
Planting*	-	✔	✔	✔	-
Landscape Establishment Maintenance	-	✔	✔	✔	-
Sample Board/Presentation					
Colour Boards Illustrating Planting Mate	-	✔	✔	✔	-
Sample Boards	-	✔	✔	✔	-
Submittals					
Arborist Report	-	-	-	✔	-
Tree Removal and Retention Plan	-	✔	-	✔	-
Seed Mix	-	-	-	✔	-

1.1.15.1 Planting specifications to include planting of trees, shrubs and groundcover, topsoil and finish grading, mulch, seeding, sodding.

1.1.15.1(1) The 30% submission will include scalable, digitally produced, colour rendered, form and character drawings which illustrate the following:

1.1.15.1(2) Outline of existing and proposed building(s) with existing trees or treed areas;

1.1.15.1(3) Parking layout and surface treatment;

1.1.15.1(4) Soft landscape treatment (trees, hedges, planting beds, vines, lawn), including vegetation within public road right-of-way;

1.1.15.1(5) Tree retention, removal, and replacement Plan, showing preliminary civil site grading design;

1.1.15.1(6) Landscape structures (such as fences, trellises, arbours, retaining walls, lighting);

1.1.15.1(7) Location and size of amenity areas (if applicable);

1.1.15.1(8) Location and size of outdoor spaces;

1.1.15.1(9) Location of garbage enclosure;

1.1.15.1(10) A preliminary grading information sufficient to determine special treatment or provisions to retaining elements;

1.1.15.1(11) Location and size of Courtyard areas;

1.1.15.1(12) A sun/shade study for the Secure Outdoor Spaces;

1.1.15.1(13) Garden and deck enlargement plans; and

1.1.15.1(14) BCSLA landscape schedules of assurance will be supplied by a Landscape Architect registered in British Columbia.

1.1.15.1(15) The 60% drawing submittal will have resolved the layout and grading of the site, with:

1.1.15.1(16) 60% of the irrigation and planting Design complete. Standard details will be incorporated, with site specific details underway;

1.1.15.1(17) 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;

1.1.15.1(18) A preliminary plant list of trees, shrubs, perennials, and ground covers including quantities, botanical and common names, planting sizes, and on centre spacing;

1.1.15.1(19) Location and species of boulevard trees; and preliminary construction drawings; and

1.1.15.1(20) Location, material, and height of garbage enclosure (detailed elevation drawings required).

1.1.15.1(21) The 95% drawing submittal will include completed layout and grading, irrigation, and planting Design. All details will be completed. Submittal will incorporate Owner input received at previous submissions.

1.1.15.1(22) The 100% drawings submittal will incorporate Owner input received at all previous submissions. Drawings will be updated and marked “Issued for Construction.” No landscape installation will proceed until the Issued for Construction set has been submitted.

1.1.16 Fire Safety Plans

1.1.16.1 The Design-Builder will retain a professional fire safety consultant to provide Fire Safety Plans and all related documentation as required by the Authority having Jurisdiction and coordinate in further consultation with the Owner to ensure such documentation meets all applicable Owner standards for Fire Safety Plans and related documentation.

1.1.17 Elevator Submittals

1.1.17.1 Not used.

1.1.17.2 Drawings and Submittals

1.1.17.2(1) Provide to the Owner submittals in accordance with Schedule 2.

1.1.17.2(2) Submittal, as a minimum, the following drawings and submittals:

1.1.17.2(2)a. General elevator arrangements;

1.1.17.2(2)b. Details of areas where the work joins the work of other trades;

1.1.17.2(2)c. Machine room layouts showing the location of the equipment;

1.1.17.2(2)d. Hoist way layouts drawings including the overhead, pit, car, frame and entrances details;

1.1.17.2(2)e. Cab details including the cab shell, platform, interior panels, ceiling, entrance, lighting and finishes, lanterns and position indicators;

1.1.17.2(2)f. Details of control panels such as hall stations, car stations, central control consoles or fire control panels showing the layout and detailing the design of switches and indicator lights;

1.1.17.2(2)g. Details of any display devices complete with examples of proposed displays, symbols and layout;

1.1.17.2(2)h. Show on the general arrangement or separately, details of frames, doors, sills and supports, lanterns and gongs, including views showing the relationship of hall stations, lanterns and entrances; and

1.1.17.2(2)i. Provide as built information at job completion prior to Substantial Performance.

1.1.17.2(3) Submit documentation to verify compliance with Project's LEED objectives and requirements.

1.1.17.3 Wiring Diagrams

1.1.17.3(1) Supply to the Owner wiring diagrams and data as required for the execution of the Work including schematics for speed control, dispatching system, interfaces, printed circuit boards.

1.1.17.3(2) Incorporate, as part of the schematic diagrams, a reference index ('road map') giving the location of electrical components and wiring interconnections for relay coils, relay contacts, field equipment, integrated circuits and other such devices, so that the position on the schematics of any of these items can be readily determined.

1.1.17.3(3) Supply, prior to the Substantial Performance inspection, three prints and one reproducible copy of the wiring and schematic diagrams revised to show changes that have been made.

1.1.17.3(4) Supply, prior to the Substantial Completion inspection, a PDF copy of the wiring and schematic diagrams revised to show changes that have been made.

1.1.17.3(5) If changes are subsequently made to the wiring or control, supply an additional two sets of marked-up prints and an additional PDF copy of marked-up prints of the schematics and field wiring diagrams showing the changes.

1.1.17.4 Operation and Maintenance Manuals

1.1.17.4(1) Supply to the Owner prior to Substantial Completion operation and maintenance manuals. Coordinate with DBA Section 45 Project Binder and Record Drawings

1.1.17.4(2) The operation and maintenance manual will incorporate, at a minimum:

1.1.17.4(2)a. A cover page including project title, address;

1.1.17.4(2)b. An index;

1.1.17.4(2)c. Contact details for the installer and manufacturer(s);

1.1.17.4(2)d. A warranty letter signed by a representative of Design-Builder having Owner to bind the company;

1.1.17.4(3) Controller and drive manuals, including:

1.1.17.4(3)a. A description of the controller user interface;

1.1.17.4(3)b. The installation and user's manuals;

1.1.17.4(3)c. A list of fault and error codes;

1.1.17.4(3)d. Troubleshooting and diagnostic procedures, methods of use and the adjustment of programmable parameters together with their settings at the time of final adjustment;

1.1.17.4(3)e. As-built wiring diagrams;

1.1.17.4(4) The operation of the equipment including special features, dispatching sequences, and such items as intercom systems and security systems;

1.1.17.4(5) Step-by-step instructions for the operation for special features such as Firefighters' Emergency Operation, Independent service and Emergency Power service;

1.1.17.4(6) As-built diagrams and drawings of operating panels (e.g. car panels, central control consoles) with descriptions of the function of switches and indicators;

1.1.17.4(7) A copy of the final submission to the Authority having Jurisdiction;

1.1.17.4(8) A copy of the final inspection report from the Authority having Jurisdiction;

1.1.17.4(9) Operation and maintenance manuals for other major components, including:

1.1.17.4(9)a. Door operator;

1.1.17.4(9)b. Emergency brake;

1.1.17.4(9)c. Communication system;

1.1.17.4(9)d. Safeties & governor;

1.1.17.4(9)e. Hoist machine & motor.

1.1.17.4(10) Supplier and part name for other parts (ex: travelling cable, restrictors, retainers, interlocks, car top inspection station, guide means), excluding minor or generic items such as screws, bolts, hinges.

1.1.17.4(11) Full instructions for any special maintenance procedure, repair protocol, adjustment or test not addressed in CSA B44 Safety Code for Elevators and Escalators, the ASME A17.2 Guide for Inspection or the Elevator Industry Field Employee's Safety Handbook.

1.1.17.4(12) Manufacturers' recommended maintenance intervals for each major component.

1.1.17.4(13) A copy of the Maintenance Control Program.

APPENDIX 1B

ROOM DATA SHEETS AND ADJACENCY DIAGRAMS

See separate document.

station one architects
alvin bartel, architect aibc
justin dyck, architect aibc

George Pringle Secondary School Project
Appendix 1B Room Data Sheets

As Issued | February 20, 2024

CHILLIWACK
9355 YOUNG ROAD
CHILLIWACK BC V2P 4S3

ABBOTSFORD
203-2190 W RAILWAY ST
ABBOTSFORD BC V2S 6E6

604 793 9445

soarchitects.com

1.00 Administration Department

Functional Area	Functional Unit
1.00 - ADMINISTRATION DEPARTMENT	**1.01 – GENERAL OFFICE (Minimum 81m²)**

1.01 Overview

The Administration Department will be an inclusive space that acts as a communication hub.

The space will be the main centre for support and direction with the goal to deepen relationships between administration Staff and students

Adjacencies

The Administration Department will have sightlines to the Main Entry/Atrium area and the Multi-Purpose Space.

Private office spaces will be arranged in a cluster.

Finishes	Floor	Carpet Tile
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1 10m long minimum full reception counter. Counter to have a variety of heights; 765mm high work area, HC compliant dedicated area and 900-1100mm high reception top
Equipment Provided By School District:		Provide 1 Wall Access Point (WAP) Provide: **4 computer stations, 8** computer monitors
Equipment Provided By Design Builder:		Provide data, phone, and power for **4** computer stations with mounting hardware Provide 1 wall mounted 65" display
Furniture Provided by School District:		8 waiting area chairs, 4 staff chairs, 3 filing cabinets

Plumbing / Gas	-	-	-	-	-
	-	-	-	-	-
Mechanical	- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1.26 cfm/ft², <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature	-	4 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	sensor with user interface - Wall mount CO_2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)				
Lighting	**Recessed Down Lights Feature Suspended Linear Above Desk**	**Occupancy Sensor Daylight Sensor Wall Pods Dimming**	**Emergency Lighting Required**	**50 fc average**	**0.6 min/average**
Electrical / Power	**N/A**	**12 min. receptacles**	**N/A**	**N/A**	**N/A**
Aux. Systems / Communications – Security	**7** Min. Data Outlets	**2@2 data/WAP**	**N/A**	**Two PA SPKR. W/ Vol. Control PA System Display**	**Power and data for TV**
General Activity	Main office area for staff and student administration				
Electrical / Power Notes	• Provide receptacles to adequately support office usage. • Provide minimum two maintenance receptacles.				
Aux. Systems Communications – Security Notes	• Provide data for all computer stations including telephones. • Provide data outlet for wireless access points (WAP). • Provide connection to wall mounted display(s). • Provide emergency lockdown pushbutton at office desk to initiate security procedures in accordance with SD23 guidelines.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide custom design greeting counter / working counter with lowers (AL-31) • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide minimum 2 Wood Doors with Steel Frames and vision panels. • Provide corner guards at all exterior corners of interior walls				

Functional Area	**Functional Unit**

1.00 - ADMINISTRATION DEPARTMENT	1.02 – PRINCIPAL (Minimum 17m²)				
Overview: This space will be a private office for the principal of the School. The principal's office will accommodate one workstation and a seating area for four people					
Adjacencies: The Principal's office will have direct line of sight to the Entry Plaza.					
Finishes — Floor	Carpet Tile				
Base	Rubber Base				
Walls	Painted Gypsum Board				
Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum	3050mm				
Millwork					
Equipment Provided By School District:	Provide 1 computer station with 2 monitors				
Equipment Provided By Design Builder:	Provide data, phone, and power for 1 computer station with mounting hardware				
Furniture Provided by School District:	1 corner desk with chair, 1 round table with 4 chairs 1 File Cabinet				
Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1.8 cfm/ft², <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO_2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum) Emergency HVAC Button	- -	2 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor Daylight Sensor Wall Pods Dimming**	**N/A**	**50 fc**	**0.6 min/average**
Electrical / Power	**N/A**	**4** Min. Receptacles	**Roll Shutters**	**N/A**	**N/A**
Aux. Systems / Communications – Security	**2** Min. Data Outlets	**N/A**	**N/A**	**PA SPKR. W/Vol. Control**	**N/A**
General Activity	Principal's Office				
Electrical / Power Notes	• Provide power for computer station and office use. • Exterior windows shall have powered roll shutters.				
Aux. Systems Communications – Security Notes	• Provide data outlets for computer and telephone.				
Special Requirements	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

Functional Area	Functional Unit
1.00 - ADMINISTRATION DEPARTMENT	**1.03 – OFFICE (Minimum 13m²)**

Overview: The Administration Department will be an inclusive space that acts as a communication hub for staff. The space will be the main centre for support and direction with the goal to deepen relationships between administration Staff and students.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Carpet Tile			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	T-Bar (1220mm x 610mm)			
Ceiling Height Minimum		3050mm			
Millwork					
Equipment Provided By School District:		Provide 1 computer station with 2 monitors			
Equipment Provided By Design Builder:		Provide data, phone, and power for 1 computer station with mounting hardware			
Furniture Provided by School District:		Provide 1 corner desk with chair			
Plumbing / Gas		-	-	-	-	-
		-	-	-	-	-
Mechanical		- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1.25 cfm/ft², <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO_2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- -	2 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		Architectural 2x2 Recessed	Occupancy Sensor Daylight Sensor Wall Pods Dimming	N/A	50 fc	0.6 min/average
Electrical / Power		N/A	4 Min. Receptacles	Roll Shutters	N/A -	N/A

Aux. Systems / Communications – Security	2 Min. Data Outlets	**N/A**	N/A	**PA SPKR. W/Vol. Control**	**N/A**
General Activity	Staff Office				
Electrical / Power Notes	• Provide power for computer station and office use. • Exterior windows shall have powered roll shutters.				
Aux. Systems Communications – Security Notes	• Provide data outlets for computer and telephone.				
Special Requirements	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. •				

Functional Area	Functional Unit
1.00 - ADMINISTRATION DEPARTMENT	**1.04 – OFFICE (Minimum 13m²)**

Overview:

These spaces will be private offices for the vice-principals of the School
Each Vice-Principal's office will accommodate one workstation and meeting space seating area for up to three people.

Adjacencies:

The vice principal's office will have direct line of sight to the Entry Plaza.

Finishes	Floor	Carpet Tile				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:		Provide 1 computer station with 2 monitors				
Equipment Provided By Design Builder:		Provide data, phone, and power for 1 computer station with mounting hardware				
Furniture Provided by School District:		1 corner desk with chair				
Plumbing / Gas		-	-	-	-	-
Mechanical		- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1.25 cfm/ft², <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO_2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	-	2 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		Architectural 2x2 Recessed	Occupancy Sensor Daylight Sensor	N/A	50 fc	0.6 min/average

		Wall Pods Dimming			
Electrical / Power	**N/A**	**4** Min. Receptacles	**Roll Shutters**	**N/A** -	**N/A**
Aux. Systems / Communications – Security	**2** Min. Data Outlets	**N/A**	**N/A**	**PA SPKR. W/Vol. Control**	**-N/A**
General Activity	Staff Office				
Electrical / Power Notes	• Provide power for computer station and office use. • Exterior windows shall have powered roll shutters.				
Aux. Systems Communications – Security Notes	• Provide data outlets for computer and telephone.				
Special Requirements	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

Functional Area	Functional Unit
1.00 - ADMINISTRATION DEPARTMENT	**1.05 – OFFICE (Minimum 13m²)**

Overview

This will be a private office for the purposes of the School's admin staff.
The Admin Office will accommodate one workstation and meeting space seating area for up to three people.

Adjacencies:

The Accounting Office will be adjacent to the Open Admin Area, with access to the closest workstation within three metres

Finishes	Floor	Carpet Tile				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:		Provide 1 computer station with 2 monitors				
Equipment Provided By Design Builder:		Provide data, phone, and power for 1 computer station with mounting hardware				
Furniture Provided by School District:		1 corner desk with chair				
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common fan coil with adjacent Office 1.06, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft², <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO_2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted	-	2 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	transfer air (non-ceiling plenum)				
Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Daylight Sensor Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A**	**4** Min. Receptacles	**Roll Shutters** -	**N/A** -	**N/A**
Aux. Systems / Communications – Security	**2** Min. Data Outlets	**N/A**	**N/A**	**- PA SPKR. W/Vol. Control** -	**- N/A** -
General Activity	Staff Office				
Electrical / Power Notes	• Provide power for computer station and office use. • Exterior windows shall have powered roll shutters.				
Aux. Systems Communications – Security Notes	• Provide data outlets for computer and telephone.				
Special Requirements	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

Functional Area	Functional Unit
1.00 - ADMINISTRATION DEPARTMENT	**1.06 – OFFICE (Minimum 13m²)**

Overview

This will be a private office for the purposes of the School's admin staff.
The Admin Office will accommodate one workstation and meeting space seating area for up to three people.

Adjacencies:

The Accounting Office will be adjacent to the Open Admin Area, with access to the closest workstation within three metres

Overview: The Administration Department will be an inclusive space that acts as a communication hub for staff. The space will be the main centre for support and direction with the goal to deepen relationships between administration Staff and students.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Carpet Tile
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		
Equipment Provided By School District:		Provide 1 computer station with 2 monitors
Equipment Provided By Design Builder:		Provide data, phone, and power for 1 computer station with mounting hardware, window blinds on all interior glazing
Furniture Provided by School District:		1 corner desk with chair

Plumbing / Gas	-	-	-	-	-
Mechanical	- Common fan coil with adjacent Office 1.05, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft², <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO_2 sensor for demand control ventilation	-	2 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	- Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)				
Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Daylight Sensor Wall Pods Dimming	**N/A**	**50 fc** -	**0.6 min/average**
Electrical / Power	**N/A**	**4** Min. Receptacles	**Roll Shutters**	**N/A**	**N/A**
Aux. Systems / Communications – Security	**2** Min. Data Outlets	**N/A**	**N/A**	**PA SPKR. W/Vol Control**	**N/A**
General Activity	Staff Office				
Electrical / Power Notes	• Provide power for computer station and office use. • Exterior windows shall have powered roll shutters.				
Aux. Systems Communications – Security Notes	• Provide data outlets for computer and telephone.				
Special Requirements	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

Functional Area	Functional Unit
1.00 - ADMINISTRATION DEPARTMENT	**1.07 – SAFE (Minimum 4m²)**

Overview:

The Dead File Room / Archives will be a safe files room, acting as a vault for finance documents and confidential information.
The Dead File Room / Archives room will have a 2-hour fire rating.

Adjacencies:

The Dead File Room / Archives will be within the Administration Department.
The Dead File Room / Archives will be within direct line of sight of Reception.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:		Safe				
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Neutral pressurization - Ducted transfer air (non-ceiling plenum)	-	N/A Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		2x2 Recessed	Occupancy Sensor Wall Pods	N/A	50 fc	N/A
Electrical / Power		N/A	1 Min. Receptacles	N/A	N/A	N/A
Aux. Systems / Communications – Security		0 Min. Data Outlets	N/A	N/A	N/A	N/A
General Activity		Safe Room				
Electrical / Power Notes		• Provide one receptacle				
Aux. Systems Communications – Security Notes						

Special Requirements	• Provide door with keying as per school district requirements • Provide fully accessible doors into this space • Provide 1 Wood Door with Steel Frame

Functional Area	Functional Unit
1.00 - ADMINISTRATION DEPARTMENT	**1.08 – ACCESS (Minimum 9m²)**

Overview: The Administration Department will be an inclusive space that acts as a communication hub for staff. The space will be the main centre for support and direction with the goal to deepen relationships between administration Staff and students.

Adjacencies: Refer to adjacency diagram.

Finishes	**Floor**	**Resilient Flooring**			
	Base	**Rubber Base**			
	Walls	**Painted Gypsum Board**			
	Ceiling	**T-Bar (1220mm x 610mm)**			
Ceiling Height Minimum		**2750mm**			
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:					
Furniture Provided by School District:					
Plumbing / Gas	-	-	-	-	-
Mechanical	- Neutral pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	-	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting	**Architectural recessed**	**Ceiling occupancy sensor**	**Emergency Lighting**	**30 fc**	**0.53 min/average**
Electrical / Power	**N/A**	1 Min. Receptacles	**N/A**	**N/A**	**N/A**
Aux. Systems / Communications – Security	0 Min. Data Outlets	**N/A**	**N/A**	**PA SPKR**	**N/A**
General Activity	Staff Room Access Hallway				
Electrical / Power Notes	• Provide maintenance receptacle				
Aux. Systems Communications – Security Notes	• Provide PA speaker				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates				

	• Provide fully accessible doors into this space • Provide 2 Wood Doors with Steel Frames and vision panels.

Functional Area	Functional Unit
1.00 - ADMINISTRATION DEPARTMENT	**1.09 – WC (Minimum 4m²)**

Overview: A washroom provided within the administration area.

Adjacencies: Refer to adjacency diagram.

Finishes	**Floor**	Epoxy Flooring			
	Base	Epoxy Flash Cove			
	Walls	Wall Tiles to 2.2m height with Painted Gypsum Board Above			
	Ceiling	Gypsum Board Drop Ceiling – Painted			
Ceiling Height Minimum		2450mm			
Millwork		1xL-1a; 700mm total length			
Equipment Provided By School District:					
Equipment Provided By Design Builder:		Provide 1 toilet paper holder, 1 sani disp. 1 soap disp, 1 electric hand dryer, 1 sink, 1 mirror, 1 flush valve toilet, 1 flush wall mount garbage receptacle			
Furniture Provided by School District:					
Plumbing / Gas		WC-1 - Refer to Plumbing Fixture Schedules	LV-5 - Refer to Plumbing Fixture Schedules	FD-1 - Refer to Plumbing Fixture Schedules	- -	- -
Mechanical		- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- -	n/a Occupant Load	- 35 l/s to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting		1 Wall Sconce 1 Recessed down light	Occupancy Sensor Wall Pods	Emergency Lighting	30 fc	-
Electrical / Power		N/A	1 Min. Receptacles	N/A	Electric Hand Dryer	N/A
Aux. Systems / Communications – Security		0 Min. Data Outlets	N/A	N/A	N/A	N/A
General Activity		Gender Neutral Washroom				
Electrical / Power Notes		• Provide power to all plumbing fixtures, hand dryers etc.				
Aux. Systems Communications – Security Notes		• Provide PA speaker in open area.				
Special Requirements		• Acoustic separations between adjacent rooms • Exhaust from this room				

	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide backing as required for all equipment • Slope floors to drain in all WC • Provide 1 Wood Door with Steel Frame

Functional Area	Functional Unit
1.00 - ADMINISTRATION DEPARTMENT	**1.10 – WC (Minimum 5m²)**

Overview: A washroom provided within the administration area.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring				
	Base	Epoxy Flash Cove				
	Walls	Wall Tiles to 2.2m height with Painted Gypsum Board Above				
	Ceiling	Gypsum Board Drop Ceiling – Painted				
Ceiling Height Minimum		2450mm				
Millwork		1xL-1a; 700mm total length				
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide 1 toilet paper holder, 1 sani disp. 1 soap disp, 1 electric hand dryer, 1 sink, 1 mirror, 1 flush valve toilet, 1 flush wall mount garbage receptacle				
Furniture Provided by School District:						
Plumbing / Gas		WC-1 - Refer to Plumbing Fixture Schedules	LV-5 - Refer to Plumbing Fixture Schedules	FD-1 - Refer to Plumbing Fixture Schedules	- -	- -
Mechanical		- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- -	n/a Occupant Load	- 35 l/s to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting		1 Wall Sconce 1 Recessed down light	Occupancy Sensor Wall Pods	Emergency Lighting	50 fc -	- -
Electrical / Power		N/A	1 Min. Receptacles	N/A -	Electric Hand Dryer -	N/A
Aux. Systems / Communications – Security		0 Min. Data Outlets	0 Min. Tel. Outlets	0 Min Cable Outlets	- -	- -
General Activity		Gender Neutral Washroom				
Electrical / Power Notes		• Provide power to all plumbing fixtures, hand dryers etc.				
Aux. Systems Communications – Security Notes		• Provide PA speaker in open area.				
Special Requirements		• Acoustic separations between adjacent rooms • Exhaust from this room • Provide acoustic batt insulation in all interior stud walls				

	• Provide acoustic caulk under all interior wall bottom plates • Provide backing as required for all equipment • Slope floors to drain in all WC • Provide 1 Wood Door with Steel Frame

Functional Area	Functional Unit
1.00 - ADMINISTRATION DEPARTMENT	**1.11 – HEALTH (Minimum 16m²)**

Overview:

The Medical Room will be a safe place to attend to sick / injured persons.
The Medical Room will be shaped to allow for one cot bed or murphy bed.

Adjacencies:

The Work Room will be located inside the Administration Department.
The Medical Room will have direct line of sight from Open Office Area.

Finishes	Floor	Epoxy Flooring
	Base	Epoxy Flash Cove
	Walls	Wall Tiles With Painted Gypsum Board Above
	Ceiling	Gypsum Board Drop Ceiling – Painted
Ceiling Height Minimum		2750mm
Millwork		2xL-1a, 2xU-1; 1600mm total counter length
Equipment Provided By School District:		1 Cot
Equipment Provided By Design Builder:		Provide 1 double toilet paper holder per stall, 1 sani disp. 1 soap disp, 1 electric hand dryer, 1 H/C accessible sink, 1 H/C accessible tilt mirror, 1 H/C accessible corner grab bar set, 1 coat hanger on back of door, 1 flush valve toilet, 1 H/C accessible shelf, 1 flush wall mount garbage receptacle
Furniture Provided by School District:		

Plumbing / Gas	WC-1 - Refer to Plumbing Fixture Schedules	LV-4 - Refer to Plumbing Fixture Schedules	FD-1 - Refer to Plumbing Fixture Schedules	- -	- -
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- -	n/a Occupant Load	- 35 l/s to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting	Low glare arechitectural 2x2's	Occupancy Sensor Dimming Wall Pods	Emergency Lighting	80 fc	0.6 min/average
Electrical / Power	N/A	3 Min. Receptacles	N/A -	Bed connection if required	N/A
Aux. Systems / Communications – Security	0 Min. Data Outlets	N/A	Wall Mount Telephone	PA SPKR c/w volume control	N/A
General Activity	Health Room				

Electrical / Power Notes	• Provide power to all plumbing fixtures, hand dryers etc.
Aux. Systems Communications – Security Notes	• Provide panic system pull cords and dome light/buzzer
Special Requirements	• Acoustic separations between adjacent rooms • Exhaust from this room • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide backing as required for all equipment • Slope floors to drain in all WC • Provide 1 Wood Door with Steel Frame

Functional Area	Functional Unit
1.00 - ADMINISTRATION DEPARTMENT	**1.12 – COPY / STORAGE (Minimum 26m²)**

Overview:

The Work Room will be provided for faculty and Staff use, for preparation of materials and holding meetings

The Work Room will provide access for Staff for work tables, a photocopier and scanner

Adjacencies:

The Work Room will be located inside the Administration Department.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork		5xL-1a (4000mm total length), 5xU-1 (4000mm total length), 9xH-8 (3600mm total length)				
Equipment Provided By School District:		1 Printer				
Equipment Provided By Design Builder:		Provide data and power for 1 printer station				
Furniture Provided by School District:						
Plumbing / Gas		- -	- -	- -	- -	- -
Mechanical		-	- -	n/a Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		Architectural 2x2 Recessed	Occupancy Sensor Wall Pods	Emergency Lighting	50 fc	0.6 min/average
Electrical / Power		N/A	8 Min. Receptacles	N/A -	Printer	N/A
Aux. Systems / Communications – Security		4 Min. Data Outlets	N/A	Wall Mount Telephone	One PA SPKR. W/Vol Control	N/A
General Activity		Copy and storage room				
Electrical / Power Notes		• Provide power for printer station. • Provide minimum one maintenance receptacle.				
Aux. Systems Communications – Security Notes		• Provide data for printer station.				

Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide 2 Wood Doors with Steel Frames and vision panels. Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
1.00 - ADMINISTRATION DEPARTMENT	**1.13 – SECURE STORAGE (Minimum 18m²)**

Overview: A provided room that can be lockable for any sensitive and / or confidential materials.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	T-Bar (1220mm x 610mm)			
Ceiling Height Minimum		3050mm			
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:					
Furniture Provided by School District:					
Plumbing / Gas		- -	- -	- -	- -	- -
Mechanical		-	- -	n/a Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		2x2 Recessed	Occupancy Sensor Wall Pods	N/A	50 fc -	- -
Electrical / Power		N/A	1 Min. Receptacles	Emergency Lighting	50 fc	0.3 min/average
Aux. Systems / Communications – Security		0 Min. Data Outlets	N/A	N/A	PA SPKR.	N/A
General Activity		Storage room				
Electrical / Power Notes		• Provide maintenance receptacle.				
Aux. Systems Communications – Security Notes		•				
Special Requirements		• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls				

	• Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide 1 Wood Door with Steel Frame.

Functional Area	Functional Unit
1.00 - ADMINISTRATION DEPARTMENT	**1.14 – STAFF ROOM (Minimum 82m²)**

Overview:

The Staff Room – Kitchen will form part of the Staff Room and is a combined space
The Staff Room – Kitchen will provide area for Staff to store and prepare meals.
The Staff Room – Kitchen will include appliances and storage for kitchen utensils, crockery and food supplies.
Countertop outlets will be provided for countertop appliances.

Adjacencies:

The Staff Room – Kitchen will be part to the Staff Room - Work Room / Lounge

Finishes	Floor	Carpet Tile			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	T-Bar (1220mm x 610mm), Gypsum Board Bulkhead			
Ceiling Height Minimum		2750mm			
Millwork		4xL-1a, 1xL-10, 2xL-12, 1xU-3, 1xU-4, 3xU-1, 3xU-5; 5100mm total kitchenette length.			
Equipment Provided By School District:					
Equipment Provided By Design Builder:		1 Double sink; 2 Full Size Refrigerator / Freezer combo, 3 microwaves ,1 Electric range, 1 dishwasher all Energy Star efficient 1 wall mounted TV			
Furniture Provided by School District:		2 Couches, 4 round tables, 24 chairs			
Plumbing / Gas		SK-5 - Refer to Plumbing Fixture Schedules	Connect to equipment provided by owner	- -	- -	- -
Mechanical		- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1.19 cfm/ft², <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface	- -	n/a Occupant Load	- Local (non-DDC control) range hood - Exhaust to discharge at roof level	- Light hazard occupancy fire protection

	- Wall mount CO_2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)				
Lighting	**Architectural 2x2 Recessed**	**Daylight Sensor** Wall Pod Dimming	**Emergency Lighting**	**50 fc** -	**0.6 min/average**
Electrical / Power	**N/A**	**19** Min. Receptacles	**N/A**	**2 Refrigerators** **3 Microwaves** 1 Dishwasher 1 Range	**N/A**
Aux. Systems / Communications – Security	**3** Min. Data Outlets	**1@2 data/WAP**	**Wall Mount Telephone**	**PA SPKR. W/Vol. Control**	**Wall Mount TV**
General Activity	Staff Room				
Electrical / Power Notes	• Provide receptacles for general usage. • Provide receptacles and connections for all kitchen appliances. • Countertop receptacles shall be on dedicated circuits.				
Aux. Systems Communications – Security Notes	• Provide PA speaker and volume control. • Provide wireless access point. • Provide connections for TV.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls • Provide 1 Wood Door with Steel Frame and vision panel.				

2.00 Counselling

Functional Area	Functional Unit
2.00 - COUNSELLING	**2.01 – COUNSELLING (Minimum 46m²)**

Overview:

The Counselling department will be a welcoming area to provide both career counselling and personal counselling services.
The Counselling department will support vulnerable learners and students with special needs in private one-on-one consultations.
The Counselling department will support career counselling

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Carpet Tile			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	T-Bar (1220mm x 610mm)			
Ceiling Height Minimum		2750mm With Bulkhead			
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:		Provide data, phone, and power for 1 computer station with mounting hardware			
Furniture Provided by School District:		Provide 1 desk with chair			
Plumbing / Gas		-	-	-	-	-
		-	-	-	-	-
Mechanical		- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft², <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO_2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	-	2 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

Lighting	**2x2 Achitectural low glare rececessed**	**Occupancy Sensor Daylight Sensor Wall Pods Dimming**	**Emergency Lighting**	**50 fc** -	**0.6 min/average**
Electrical / Power	**N/A**	**5** Min. Receptacles	**N/A** -	**N/A** -	**N/A** -
Aux. Systems / Communications – Security	**3** Min. Data Outlets	**1@2 data/WAP**	N/A	**PA SPKR c/w volume control**	**N/A**
General Activity	Counselling Access				
Electrical / Power Notes	• Provide power for computer stations and office use.				
Aux. Systems Communications – Security Notes	•				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide acoustic vestibule with 2 Wood Doors with Steel Frames and vision panels.				

Functional Area	Functional Unit
2.00 - COUNSELLING	**2.02 – SUPPORT (Minimum 11m²)**

Overview:

The Counselling Offices will provide private offices for private conversations between counsellors and students.
One Counselling Office will serve as an itinerant office and can be located within the the Counselling department

Adjacencies:

The Counselling Offices will be adjacent to one another

Finishes	Floor	Carpet Tile				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		2750mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide data, phone, and power for 1 computer station with mounting hardware				
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common fan coil with adjacent interior offices, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft², <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO_2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	-	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		**Architectural 2x2 Recessed**	**Occupancy Sensor** Daylight Sensor	**No Emergency**	**50 fc**	0.6 min/average

		Dimming			
Electrical / Power	**N/A**	**2** Min. Receptacles	**N/A** -	**N/A** -	**N/A**
Aux. Systems / Communications – Security	**2** Min. Data Outlets	**N/A**	**N/A**	**PA SPKR. W/Vol Control**	**N/A**
General Activity	Support Room				
Electrical / Power Notes	• Provide power for computer station.				
Aux. Systems Communications – Security Notes	Provide data for computer and telephone.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Aluminum Door and Aluminum Frame.				

Functional Area	Functional Unit
2.00 - COUNSELLING	**2.03 – SUPPORT (Minimum 11m²)**

Overview:

The Counselling Offices will provide private offices for private conversations between counsellors and students.
One Counselling Office will serve as an itinerant office and can be located within the the Counselling department

Adjacencies:

The Counselling Offices will be adjacent to one another

Finishes	Floor	Carpet Tile				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		2750mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide data, phone, and power for 1 computer station with mounting hardware				
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common fan coil with adjacent interior offices, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft², <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO_2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	-	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Daylight Sensor Dimming	**No Emergency**	**50 fc** -	0.6 min/average
Electrical / Power	**N/A**	**2** Min. Receptacles	**N/A** -	**N/A** -	
Aux. Systems / Communications – Security	**2** Min. Data Outlets	**N/A**	**N/A**	**PA SPKR. W/Vol. Control**	**N/A**
General Activity	Support Room				
Electrical / Power Notes	• Provide power for computer station.				
Aux. Systems Communications – Security Notes	• Provide data for computer and telephone.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Aluminum Door and Aluminum Frame.				

Functional Area	Functional Unit
2.00 - COUNSELLING	**2.04 – SUPPORT (Minimum 11m²)**

Overview:

The Counselling Offices will provide private offices for private conversations between counsellors and students.
One Counselling Office will serve as an itinerant office and can be located within the the Counselling department

Adjacencies:

The Counselling Offices will be adjacent to one another

Finishes	**Floor**	**Carpet Tile**				
	Base	**Rubber Base**				
	Walls	**Painted Gypsum Board**				
	Ceiling	**T-Bar (1220mm x 610mm)**				
Ceiling Height Minimum		**2750mm**				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		**Provide data, phone, and power for 1 computer station with mounting hardware**				
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common fan coil with adjacent interior offices, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft², <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO_2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	-	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Daylight Sensor Dimming	**N/A**	**50 fc** -	**0.6 min/average**
Electrical / Power	**N/A**	**2** Min. Receptacles	**N/A** -	**N/A** -	**N/A** -
Aux. Systems / Communications – Security	**2** Min. Data Outlets	**N/A**	**N/A**	**PA SPKR. W/Vol. Control**	**N/A**
General Activity	Support Room				
Electrical / Power Notes	• Provide power for computer station.				
Aux. Systems Communications – Security Notes	• Provide data for computer and telephone.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Aluminum Door and Aluminum Frame.				

Functional Area	Functional Unit
2.00 - COUNSELLING	**2.05 – SUPPORT (Minimum 11m²)**

Overview:

The Counselling Offices will provide private offices for private conversations between counsellors and students.
One Counselling Office will serve as an itinerant office and can be located within the the Counselling department

Adjacencies:

The Counselling Offices will be adjacent to one another

Finishes	Floor	Carpet Tile				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		2750mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide data, phone, and power for 1 computer station with mounting hardware				
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common fan coil with adjacent exterior offices, heating/cooling, MERV 13 filtration - High supply, low level return, 1.45 cfm/ft², <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO_2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	-	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

Lighting	**Architectural** **2x2 Recessed**	**Occupancy Sensor** Daylight Sensor Dimming	**N/A**	**50 fc** -	**0.6 min/average**
Electrical / Power	**N/A**	**2** Min. Receptacles	**N/A** -	**N/A** -	**1 Speaker** -
Aux. Systems / Communications – Security	**2** Min. Data Outlets	**N/A**	**N/A**	**N/A**	**-** -
General Activity	Support Room				
Electrical / Power Notes	• Provide power for workstation.				
Aux. Systems Communications – Security Notes	• Provide data for workstation and telephone.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Aluminum Door and Aluminum Frame.				

3.00 General Storage

Functional Area	Functional Unit
3.00 – GENERAL STORAGE	**3.01 – GENERAL STORAGE (Minimum 19m²)**

Overview:

General Storage areas will be distributed throughout the School unless specified otherwise.

Note: General Storage aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Painted Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:		Wall mounted shelving on all walls, installed by Design Builder				
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		- -	- -	- -	- -	- -
Mechanical		No Air Conditioning	- -	n/a Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		Surface Striplights	Occupancy Sensor Wall Pods	Emergency Lighting	50fc -	0.6 min/average
Electrical / Power			2 Min. Receptacles	N/A -	N/A -	
Aux. Systems / Communications – Security		0 Min. Data Outlets	N/A	N/A	PA SPKR	-
General Activity		Storage room Wall mounted shelving installed by DB				

Electrical / Power Notes	• Maintenance receptacles
Aux. Systems Communications – Security Notes	• PA speaker
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame.

Functional Area	Functional Unit
3.00 – GENERAL STORAGE	**3.02 – GENERAL STORAGE (Minimum 54m²)**

Overview:

General Storage areas will be distributed throughout the School unless specified otherwise.

Note: General Storage aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	**Resilient Flooring**				
	Base	**Rubber Base**				
	Walls	Exposed Painted Architectural Concrete				
	Ceiling	Exposed Painted Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:		Wall mounted shelving on all walls, installed by Design Builder				
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		- -	- -	- -	- -	- -
Mechanical		- Heavy duty, hydronic, fan assisted heater - 50 w/m² - Wall mount, vandal proof, temperature sensor (Non-adjustable)	- -	n/a Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		Surface Striplights	Occupancy Sensor Wall Pods	Emergency lighting	50fc	- -
Electrical / Power		N/A	3 Min. Receptacles	N/A -	N/A -	N/A -
Aux. Systems / Communications – Security		0 Min. Data Outlets	N/A	N/A	N/A	N/A
General Activity		Storage room				

Electrical / Power Notes	• Maintenance receptacles
Aux. Systems Communications – Security Notes	• PA speaker
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame.

Functional Area	Functional Unit
3.00 – GENERAL STORAGE	**3.04 – GENERAL STORAGE (Minimum 33m²)**

Overview:

General Storage areas will be distributed throughout the School unless specified otherwise.

Note: General Storage aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Painted Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:		Wall mounted shelving on all walls, installed by Design Builder				
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
		-	-	-	-	-
Mechanical		- Heavy duty, hydronic, fan assisted heater - 50 w/m² - Wall mount, vandal proof, temperature sensor (Non-adjustable)	-	n/a Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		Surface striplights	Occupancy Sensor Wall Pods	Emergency lighting	50fc	-
					-	-
Electrical / Power		N/A	2 Min. Receptacles	N/A	N/A	
				-	-	
Aux. Systems / Communications – Security		0 Min. Data Outlets	N/A	N/A	- PA SPKR	-
					-	-
General Activity		Storage room				

Electrical / Power Notes	• Maintenance receptacles
Aux. Systems Communications – Security Notes	• PA speaker
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame. • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
3.00 – GENERAL STORAGE	**3.05 – GENERAL STORAGE (Minimum 33m²)**

Overview:

General Storage areas will be distributed throughout the School unless specified otherwise.

Note: General Storage aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:		Wall mounted shelving on all walls, installed by Design Builder				
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Heavy duty, hydronic, fan assisted heater - 50 w/m² - Wall mount, vandal proof, temperature sensor (Non-adjustable)	-	n/a Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		Surface striplights	Occupancy Sensor Wall Pods	N/A	50fc	-
Electrical / Power		-	2 Min. receptacles	-	-	-
Aux. Systems / Communications – Security		-	-	-	PA SPKR	-
General Activity		Storage room				

Electrical / Power Notes	• Maintenance receptacles
Aux. Systems Communications – Security Notes	• PA speaker
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame. Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
3.00 – GENERAL STORAGE	**3.06 – GENERAL STORAGE (Minimum 35m²)**

Overview:

General Storage areas will be distributed throughout the School unless specified otherwise.

Note: General Storage aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	Exposed Painted Structure Above			
Ceiling Height Minimum		Exposed Painted Structure Above			
Millwork					
Equipment Provided By School District:		Wall mounted shelving on all walls, installed by Design Builder			
Equipment Provided By Design Builder:					
Furniture Provided by School District:					
Plumbing / Gas		-	-	-	-	-
		-	-	-	-	-
Mechanical		- Heavy duty, hydronic, fan assisted heater - 50 w/m² - Wall mount, vandal proof, temperature sensor (Non-adjustable)	- -	n/a Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		Surface striplights	Occupancy Sensor Wall Pods	N/A	50fc -	- -
Electrical / Power			5 Min. Receptacles	N/A	N/A	1 Speaker
Aux. Systems / Communications – Security					PA SPKR	- -
General Activity		Storage room				

Electrical / Power Notes	• Maintenance receptacles
Aux. Systems Communications – Security Notes	• PA speaker
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame. • Provide corner guards at all exterior corners of interior walls

4.00 Gymnasium Activity Space

Functional Area	Functional Unit
4.00 – GYMNASIUM ACTIVITY SPACE	4.01 – GYMNASIUM (PART A) (Minimum 457m²)

Overview:

Provide one large Gymnasium Activity Space, with the capability to separate into equal spaces to form Gym A and Gym B, by means of a motorized gymnasium curtain partition.
The total occupant load for the gym is to be a minimum of 1,000 people.
Motorized retractable bleacher seating will be provided on a single side of the Gymnasium Activity Space to accommodate 600 people for general assembly functions. For sporting events the bleachers will be partially extended to accommodate 500 people without impeding the sporting court.
The Gymnasium Activity Space will be used for large presentation functions such as convocations and graduation ceremonies
A projector, projection screen and sound system are required for presentation functions.
Both Gym A and Gym B will have minimum dimensions of 26m X 17.5m, with their combined minimum dimension being no less than . 26m X 35m.
Both Gym A and Gym B will have sprung hardwood floor, complete with games lines and games standards sockets for basketball, volleyball and badminton.
The layout will maximize the number of regulation-sized badminton courts. A minimum of six courts are required between Gym A and Gym B.
Retractable bleachers will be oriented for viewing of competition courts
Provide a secured closet for the sound system and mixing board accessible by students. Sound system and mixing board are not to be within the Staff Work Room.
Gym A and Gym B will each be provided with Natural Light through glazing above 4m from the floor. Glazing will be north facing and/or shielded to protect from direct exposure to reduce glare and unwanted solar gains. Glazing will be suitable for use in high activity areas, specifically suited for gymnasium applications. Glazing to be accommodated with electrified black out interior roller shades.
Gym A and Gym B will be provided with high-level motorized louvers or motorized operable windows to allow for passive ventilation.
Provide padding for all sharp corners in the gymnasiums and end-of-court padding on the walls directly behind the basketball hoops. Padding will be high density polyurethane foam complete with fasteners.

Adjacencies:

The Gymnasium Activity Space will be directly observable through large glazed openings the between Gymnasium Activity Space and adjacent circulation spaces					
Finishes	**Floor** **Base** **Walls** **Ceiling**	**Sprung Wood Gymnasium Flooring** **Vented Cove Base** **Birch Panels Up To Top Of Door Height, Painted Acoustic Panels Above, from Door Height to minimum of U/S of structure, Painted Gypsum Board Above** **Exposed Structure Above**			
Ceiling Height Minimum		**Exposed Structure Above**			
Millwork					
Equipment Provided By School District:		**Provide WAP installed by Design Builder**			
Equipment Provided By Design Builder:		**Provide 1 center electric roll up divider curtain, 3 ceiling hung drop down basketball backstops, 1 score board unit, 1 shot clock, 1 large digital display, 1 set of volleyball net stanchions, 3 sets of posts and nets for badminton, 1 set of posts and net for volleyball, bleachers for occupancy of 600, motorized black out curtains for exterior windows**			
Furniture Provided by School District:					
Plumbing / Gas		- -	- -	- -	- -	- -
Mechanical		- Common to Gymnasium 4.01 and 4.02, roof mounted air handling unit, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount, vandal proof, temperature sensor (Non-adjustable) - Return air CO2 sensor for demand control ventilation - Positive pressurization	- Exposed ductwork	**~600** Occupant Load	- 50% outdoor air/supply air ratio, dedicated energy recovery ventilation - Outdoor air supply efficiency under winter design condition with frost control of 67%	- Light hazard occupancy fire protection
Lighting		**High Bay gym luminaires**	**Occupancy Sensors** Dimming/scenes Wall Pods	**Emergency Lighting** Exit lights	**100fc**	0.5 min/average
Electrical / Power		**Panel (may be in storage room)**	**5** Min. Receptacles	**Motorized Hoop Connection** Motorized Bleacher Connections Gym Partition motors	**N/A**	**1 Shot Clock** 1 Digital Display 3 Speakers

Aux. Systems / Communications – Security		**1@2 data/WAP**		PA SPKRS	Video wall Shot clocks AV rack Audio system c/w speakers and sub woofer, mic etc
General Activity	Gymnasium				
Electrical / Power Notes	• Provide control cabinet at main doors c/w lighting, hoop, shutter, curtain and bleacher controls • Provide power for ceiling hung basketball backstops • Provide power for bleachers • Provide power for motorized curtain • Provide power for all AV requirements • Provide outlets for stage power				
Aux. Systems Communications – Security Notes	• Provide connection to wall mounted displays • Provide video wall/score clock and shot clock systems (min 6m diagonal size) at two locations • Provide complete AV system integrated with the video wall and audio system. Provide all required outlets for score keeper stations and stage AV connections • PA speakers • All equipment shall be durable and resistant to typical gymnasium activities, provides guards where required				
Special Requirements	• Provide exterior curtainwall glazing in order to provide natural light throughout the gym. Curtainwalls to be provided with electrified interior blackout roller shades. • Provide Aluminum Doors and Aluminum Frames. • Provide games lines for 1 large full gym size basketball court • Provide games lines for 3 badminton courts • Provide games lines for 1 cross gym basketball court • Provide games lines for 1 cross gym volleyball court • Provide floor sockets for all volleyball / badminton net stanchions • Provide electric retractable bleacher seating				

Functional Area	Functional Unit
4.00 – GYMNASIUM ACTIVITY SPACE	**4.02 – GYMNASIUM (PART B) (Minimum 456m²)**

Overview:

Provide one large Gymnasium Activity Space, with the capability to separate into equal spaces to form Gym A and Gym B, by means of a motorized gymnasium curtain partition.
The total occupant load for the gym is to be a minimum of 1,000 people.
Motorized retractable bleacher seating will be provided on a single side of the Gymnasium Activity Space to accommodate 600 people for general assembly functions. For sporting events the bleachers will be partially extended to accommodate 500 people without impeding the sporting court.
The Gymnasium Activity Space will be used for large presentation functions such as convocations and graduation ceremonies
A projector, projection screen and sound system are required for presentation functions.
Both Gym A and Gym B will have minimum dimensions of 26m X 17.5m, with their combined minimum dimension being no less than 26m X 35m.
Both Gym A and Gym B will have sprung hardwood floor, complete with games lines and games standards sockets for basketball, volleyball and badminton.
The layout will maximize the number of regulation-sized badminton courts. A minimum of six courts are required between Gym A and Gym B.
Retractable bleachers will be oriented for viewing of competition courts
Provide a secured closet for the sound system and mixing board accessible by students. Sound system and mixing board are not to be within the Staff Work Room.
Gym A and Gym B will each be provided with Natural Light through glazing above 4m from the floor. Glazing will be north facing and/or shielded to protect from direct exposure to reduce glare and unwanted solar gains. Glazing will be suitable for use in high activity areas, specifically suited for gymnasium applications. Clear storey glazing to be accommodated with electrified black out interior roller shades.
Gym A and Gym B will be provided with high-level motorized louvers or motorized operable windows to allow for passive ventilation.
Provide padding for all sharp corners in the gymnasiums and end-of-court padding on the walls directly behind the basketball hoops. Padding will be high density polyurethane foam complete with fasteners.

Adjacencies:

The Gymnasium Activity Space will be directly observable through large glazed openings the between Gymnasium Activity Space and adjacent circulation spaces

Finishes **Floor** **Base** **Walls** **Ceiling**	**Sprung Wood Gymnasium Flooring** **Vented Cove Base** **Birch Panels Up To Top Of Door Height, Painted Acoustic Panels Above from Door Height to minimum of U/S of structure, Painted Gypsum Board Above** **Exposed Structure Above**				
Ceiling Height Minimum	**Exposed Structure Above**				
Millwork					
Equipment Provided By School District:	**<u>Provide WAP installed by Design Builder</u>**				
Equipment Provided By Design Builder:	**Provide 3 ceiling hung drop down basketball backstops, provide 1 score board unit, 1 shot clock, 1 large digital display, 1 set of volleyball net stanchions, 3 sets of posts and nets for badminton, 1 set of posts and net for volleyball, bleachers for occupancy of 600, motorized black out curtains for exterior windows**				
Furniture Provided by School District:					
Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	- Common to Gymnasium 4.01 and 4.02, roof mounted air handling unit, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount, vandal proof, temperature sensor (Non-adjustable) - Return air CO2 sensor for demand control ventilation - Positive pressurization	- Exposed ductwork	**~600** Occupant Load	- 50% outdoor air/supply air ratio, dedicated energy recovery ventilation - Outdoor air supply efficiency under winter design condition with frost control of 67%	- Light hazard occupancy fire protection
Lighting	**High Bay gym luminaires**	**Occupancy Sensor** Dimming/scenes Wall Pods	**Emergency Lighting** Exit lights	**100fc** -	0.5 min/average
Electrical / Power	**Panel (may be storage room)**	**5** Min. Receptacles	**Motorized Hoop Connections** Motorized Bleacher Connections	**N/A** -	
Aux. Systems /		**1@2 data/WAP**		- PA SPKRS -	- Video wall per side Shot clocks

Communications – Security					AV rack Audio system c/w speakers and sub woofer, mic etc -
General Activity	Gymnasium				
Electrical / Power Notes	• Provide control cabinet at main doors c/w lighting, hoop, shutter, curtain and bleacher controls • Provide power for ceiling hung basketball backstops • Provide power for bleachers • Provide power for all AV requirements • Provide outlets for stage power				
Aux. Systems Communications – Security Notes	• Provide connection to wall mounted displays • Provide video wall/score clock and shot clock systems (min 6m diagonal size) at two locations • Provide complete AV system integrated with the video wall and audio system. Provide all required outlets for score keeper stations and stage AV connections • PA speakers • All equipment shall be durable and resistant to typical gymnasium activities, provides guards where required				
Special Requirements	• Provide exterior curtainwalls of varying height to match the roof line in order to provide natural light throughout the gym. Curtainwalls to be provided with electrified interior blackout roller shades. Provide double aluminum door with glazing (safety glass) per exterior curtainwall to exterior • Provide games lines for 1 large full gym size basketball court • Provide games lines for 3 badminton courts • Provide games lines for 1 cross gym basketball court • Provide games lines for 1 cross gym volleyball court • Provide floor sockets for all volleyball / badminton net stanchions • Provide Wood Doors with Steel Frames and vision panels.				

Functional Area	Functional Unit
4.00 – GYMNASIUM ACTIVITY SPACE	**4.03 – GYMNASIUM (PART C) (Minimum 459m²)**

Overview: Provide one large Gymnasium Activity Space..

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Sprung Wood Gymnasium Flooring
	Base	Vented Cove Base
	Walls	Birch Panels Up To Top Of Door Height, Painted Acoustic Panels Above from Door Height to minimum of U/S of structure, Painted Gypsum Board Above
	Ceiling	Exposed Structure Above
Ceiling Height Minimum		Exposed Structure Above
Millwork		
Equipment Provided By School District:		
Equipment Provided By Design Builder:		Provide 1 large digital display, 2 shot clocks, Provide 2 ceiling hung drop down basketball backstops, motorized black out blinds for exterior windows 1 set of volleyball net stanchions, 3 sets of posts and nets for badminton, 1 set of posts and net for volleyball,
Furniture Provided by School District:		

Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	- Common to Gymnasium 4.03 and PE Instructors 5.09, roof mounted air handling unit, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount, vandal proof, temperature	- -	-600 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	sensor (Non-adjustable) - Return air CO2 sensor for demand control ventilation - Positive pressurization				
Lighting	**20 High Bay Lights**	**Occupancy Sensor** Dimming Wall Pods	**Emergency Lighting** 3 Exits	**100fc**	-0.5 min/average -
Electrical / Power	**Panel (may be storage room)**	**10** Min. Receptacles	**Motorized Hoop Connections** Roll Shutter Connections	**N/A** -	Video wall per side Shot clocks AV rack Audio system c/w speakers and sub woofer, mic etc
Aux. Systems / Communications – Security	**2** Min. Data. Outlet	**0** Min. Tel. Outlet	**0** Min. Cable Outlet	- -	- -
General Activity	Gymnasium				
Electrical / Power Notes	• Provide control cabinet at main doors c/w lighting, hoop, shutter, curtain and bleacher controls • Provide power for ceiling hung basketball backstops • Provide power for all AV requirements • Provide outlets for stage power				
Aux. Systems Communications – Security Notes	• Provide connection to wall mounted displays • Provide video wall/score clock and shot clock systems (min 6m diagonal size) at two locations • Provide complete AV system integrated with the video wall and audio system. Provide all required outlets for score keeper stations and stage AV connections • PA speakers • All equipment shall be durable and resistant to typical gymnasium activities, provides guards where required				
Special Requirements	• Provide exterior curtainwalls (total length 6500mm) in order to provide natural light throughout the gym. Curtainwalls to be provided with electrified interior blackout roller shades. • Provide Aluminum Door and Aluminum Frame. • Provide games lines for 1 large full gym size basketball court • Provide games lines for 3 badminton courts • Provide games lines for 1 gym basketball court • Provide games lines for 1 gym volleyball court • Provide floor sockets for all volleyball / badminton net stanchions				

	• Provide Wood Doors with Steel Frames and vision panels.

5.00 Gym Ancillary Space

Functional Area	Functional Unit
5.00 – GYM ANCILLARY SPACE	**5.01 – TEAM #1 CHANGE (Minimum 46m²)**

Overview:

Gymnasium Ancillary Space provides support space for the fitness and athletics of the School.
Gymnasium Ancillary Space includes locker rooms, work rooms, washrooms, showers Change Room will be complete with one shower / dressing cubicles, one toilet room with sink to accommodate 30 Occupants within the secured area of the Gymnasium Ancillary Space.

Adjacencies:

All Gymnasium Ancillary Spaces will be in close proximity to the Gymnasium Activity Space.
All Change Rooms will have two entry doors from the corridor, with access oriented at each end.
Provide GN lockers within an area outside of change room area.

Finishes	Floor	Epoxy Flooring
	Base	Epoxy Flash Cove
	Walls	Painted Gypsum Board
	Ceiling	Gypsum Board Drop Ceiling – Painted
Ceiling Height Minimum		3050mm
Millwork		3xM-4 (12.72m total length), 2xM-2 (2600mm total length)
Equipment Provided By School District:		
Equipment Provided By Design Builder:		Provide 15 triple lockers with sloping top, provide fully accessible shower stall with all hardware and backing as required. **Bench wall and isolated seating to be provided throughout for minimum 30 individuals.**
Furniture Provided by School District:		

Plumbing / Gas	SH-2 - Refer to Plumbing Fixture Schedules	- -	FD-1 - Refer to Plumbing Fixture Schedules	-	- -
Mechanical	- Negative pressurization - Acoustically lined ducted	- -	n/a Occupant Load	- 70 l/s to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection

	transfer air (non-ceiling plenum) - Common in-slab hydronic radiant heat with 5.02 - In-slab temperature sensor - 50 w/m2 - Companion wall mount, vandal proof, temperature sensor (Non-adjustable)				
Lighting	**Architectural 2x2 Recessed in open area.** Recessed light in shower.	**Occupancy Sensor** Wall Pods	**Emergency Lighting**	**40fc** -	**-0.3 min/average** -
Electrical / Power	**N/A**	**3** Min. Receptacles	**N/A** -	**N/A** -	**N/A** -
Aux. Systems / Communications – Security	**0** Min. Data Outlets	**N/A**	**N/A**	**- PA SPKR.** -	**-** -
General Activity	Change room for team #1				
Electrical / Power Notes	• Receptacles shall be 20A for maintenance.				
Aux. Systems Communications – Security Notes	•				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Slope floor of shower room min. 2% to floor drain • Provide corner guards at all exterior corners of interior walls • Provide Wood Doors with Steel Frames.				

Functional Area	Functional Unit
5.00 – GYM ANCILLARY SPACE	**5.02 – TEAM #2 CHANGE (Minimum 46m²)**

Overview:

Gymnasium Ancillary Space provides support space for the fitness and athletics of the School.
Gymnasium Ancillary Space includes locker rooms, work rooms, washrooms, showers. Change Room will be complete with one shower / dressing cubicles, one toilet room with sink to accommodate 30 Occupants within the secured area of the Gymnasium Ancillary Space.

Adjacencies:

All Gymnasium Ancillary Spaces will be in close proximity to the Gymnasium Activity Space.
All Change Rooms will have two entry doors from the corridor, with access oriented at each end.
Provide GN lockers within an area outside of change room area.

Finishes	Floor	Epoxy Flooring
	Base	Epoxy Flash Cove
	Walls	Painted Gypsum Board
	Ceiling	Gypsum Board Drop Ceiling – Painted
Ceiling Height Minimum		3050mm
Millwork		3xM-4 (12.72m total length), 2xM-2 (2600mm total length)
Equipment Provided By School District:		
Equipment Provided By Design Builder:		**Provide 15 triple lockers with sloping top, provide fully accessible shower stall with all hardware and backing as required Bench wall and isolated seating to be provided throughout for minimum 30 individuals.**
Furniture Provided by School District:		

Plumbing / Gas	SH-2 - Refer to Plumbing Fixture Schedules	- -	FD-1 - Refer to Plumbing Fixture Schedules	-	- -
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- -	n/a Occupant Load	- 70 l/s to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection

	- Common in-slab hydronic radiant heat with 5.01 - In-slab temperature sensor - 50 w/m2 - Companion wall mount, vandal proof, temperature sensor (Non-adjustable)				
Lighting	**Architectural 2x2 Recessed in open area.** Recessed light in shower.	**Occupancy Sensor** Wall Pods	**Emergency Lighting**	**40fc** -	**0.3 min/average**
Electrical / Power	**N/A**	**3** Min. Receptacles	**N/A** -	**N/A** -	N/A
Aux. Systems / Communications – Security	**0** Min. Data Outlets	**N/A**	**N/A**	**-** PA SPKR. -	**- N/A** -
General Activity	Change room for team #2				
Electrical / Power Notes	• Receptacles shall be 20A for maintenance.				
Aux. Systems Communications – Security Notes	•				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Slope floor of shower room min. 2% to floor drain • Provide corner guards at all exterior corners of interior walls • Provide Wood Doors with Steel Frames.				

Functional Area	Functional Unit
5.00 – GYM ANCILLARY SPACE	**5.03 – CHANGE STALLS (Minimum 14m²)**

Overview:

Gender Neutral Change Rooms will be small stalls for clothing changing.
One of the GN Change Rooms will be accessible and are to be larger as required.

Adjacencies:

Change Rooms will be adjacent to the main circulation corridor, and located on the ground floor.

Finishes	Floor	Epoxy Flooring			
	Base	Epoxy Flash Cove			
	Walls	Wall Tile			
	Ceiling	Gypsum Board Drop Ceiling - Painted			
Ceiling Height Minimum		2450mm			
Millwork		5xM-4 (1 M-4 Unit Per Individual Stall); each unit is 1000m in total length.			
Equipment Provided By School District:					
Equipment Provided By Design Builder:					
Furniture Provided by School District:					
Plumbing / Gas		-	-	-	-
		-	-	-	-
Mechanical		- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	-	n/a Occupant Load	- 35 l/s per individual stall to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting		Recessed down lights	Occupancy Sensor Wall Pods	Emergency Lighting	30fc -	-0.3 min/average -
Electrical / Power		N/A	0 Min. Receptacles	N/A	N/A	N/A
Aux. Systems / Communications – Security		0 Min. Data Outlets	N/A	N/A	-	-
General Activity		5 Change Stalls				
Electrical / Power Notes		•				
Aux. Systems Communications –		•				

Security Notes	
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide doors with double swing hinges if layout requires recovery access function. • Coordinate change stall door keying with school district • Provide Wood Doors with Steel Frames.

Functional Area	Functional Unit
5.00 – GYM ANCILLARY SPACE	**5.04 – ACCESS (Minimum 36m²)**

Overview:

Provide Gender Neutral change rooms within an area outside of change room area.

Adjacencies:

GN Change Rooms will be adjacent to GN Locker Space and located on the ground floor. GN Change Rooms will be within 25m of Gym A and B, measured along the path of travel from the closest door to each space.

Finishes	Floor	Epoxy Flooring
	Base	Epoxy Flash Cove
	Walls	Wall Tile
	Ceiling	Gypsum Board Drop Ceiling - Painted
Ceiling Height Minimum		3050mm
Millwork		
Equipment Provided By School District:		
Equipment Provided By Design Builder:		Provide 2 floor drains min., 2x3-station sink units, 3 electric hand dryers, 4 soap dispensers, 6 mirrors (one above each sink station, 550x1000mm) 1 flush wall mounted garbage receptacle
Furniture Provided by School District:		

Plumbing / Gas	-	- -	LV-3 @ 2 - Refer to Plumbing Fixture Schedules	FD-1 @ 2 - Refer to Plumbing Fixture Schedules	- -
Mechanical	-	- -	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting	Recessed down lights Wall Sconces above sinks	Dimming On corridor lighting circuit	Emergency Lighting	40 fc	-0.3 min/average
Electrical / Power	N/A	3 Min. Receptacles	N/A	Powered sinks	N/A
Aux. Systems / Communications – Security	0 Min. Data Outlets	N/A	N/A	- N/A -	- N/A -

General Activity	Change room access hallway
Electrical / Power Notes	• Provide two maintenance receptacles.
Aux. Systems	•

Communications – Security Notes	
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Slope floors to drain • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
5.00 – GYM ANCILLARY SPACE	**5.05 – UNIVERSAL (Minimum 7m²)**

Overview: A universal washroom to be provided to accommodate in close proximity of the gym.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring
	Base	Epoxy Flash Cove
	Walls	Wall Tile
	Ceiling	Gypsum Board Drop Ceiling - Painted
Ceiling Height Minimum		2450mm
Millwork		
Equipment Provided By School District:		
Equipment Provided By Design Builder:		Provide 1 flush valve toilet, 1 H/C grab bar corner unit, 1 t.p. disp, 1 sani disp, 1 h/c shelf, 1 H/C sink, 1 H/C tilt mirror, 1 soap dispenser, 1 electric hand dryer, 1 floor drain, 1 coat hook on back of door, 1 flush wall mounted garbage receptacle
Furniture Provided by School District:		

Plumbing / Gas	WC-1 - Refer to Plumbing Fixture Schedules	LV-5 - Refer to Plumbing Fixture Schedules	FD-1 - Refer to Plumbing Fixture Schedules	-	- -
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- -	n/a Occupant Load	- 35 l/s to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting	Recessed down lights Vanity Wall Sconce	Occupancy Sensor	Emergency Lighting	30fc	-0.3 min/average -
Electrical / Power	N/A	1 Min. Receptacles	N/A	Plumbing fixtures	N/A
Aux. Systems / Communications – Security	0 Min. Data Outlets	N/A	N/A	- N/A -	- N/A -
General Activity	Universal H/C washroom				
Electrical / Power Notes	• Provide power to all plumbing and washroom fixtures as required. Confirm additional receptacle				

	requirements or direct connections to low voltage relays.
Aux. Systems Communications – Security Notes	•
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Slope floors to drain • Provide doors with double swing hinges if layout requires recovery access function. • Coordinate door keying with school district • Provide Wood Door with Steel Frame.

Functional Area	Functional Unit
5.00 – GYM ANCILLARY SPACE	**5.06 – WC (Minimum 4m²)**

Overview: A washroom to be provided to accommodate in close proximity of the gym.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring
	Base	Epoxy Flash Cove
	Walls	Wall Tile
	Ceiling	Gypsum Board Drop Ceiling - Painted
Ceiling Height Minimum		2450mm
Millwork		
Equipment Provided By School District:		
Equipment Provided By Design Builder:		Provide 1 flush valve toilet, 1 t.p. disp, 1 sani disp, sink, 1 mirror, 1 soap dispenser, 1 electric hand dryer, 1 floor drain 1 wall mounted garbage receptacle
Furniture Provided by School District:		

Plumbing / Gas	WC-1 - Refer to Plumbing Fixture Schedules	LV-5 - Refer to Plumbing Fixture Schedules	FD-1 - Refer to Plumbing Fixture Schedules	-	-
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	-	n/a Occupant Load	- 35 l/s to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting	Recessed down light Vanity Wall Sconce	Occupancy Sensor Wall Pods	Emergency Lighting	30fc	-0.3 min/average
Electrical / Power	N/A	1 Min. Receptacles	N/A	Plumbing	N/A
Aux. Systems / Communications – Security	0 Min. Data Outlets	N/A	N/A	- N/A	- N/A

General Activity	Universal washroom
Electrical / Power Notes	• Provide power to all plumbing and washroom fixtures as required. Confirm additional receptacle requirements or direct connections to low voltage relays.
Aux. Systems Communications – Security Notes	•

Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Slope floors to drain • Provide doors with double swing hinges if layout requires recovery access function. • Coordinate door keying with school district • Provide Wood Door with Steel Frame.

Functional Area	Functional Unit
5.00 – GYM ANCILLARY SPACE	**5.07 – WC (Minimum 4m²)**

Overview: A washroom to be provided to accommodate in close proximity of the gym.

Adjacencies: Refer to adjacency diagram.

Finishes – Floor	Epoxy Flooring
Base	Epoxy Flash Cove
Walls	Wall Tile
Ceiling	Gypsum Board Drop Ceiling - Painted
Ceiling Height Minimum	2450mm
Millwork	
Equipment Provided By School District:	
Equipment Provided By Design Builder:	Provide 1 flush valve toilet, 1 t.p. disp, 1 sani disp, sink, 1 mirror, 1 soap dispenser, 1 electric hand dryer, 1 floor drain, 1 flush wall mounted garbage receptacle
Furniture Provided by School District:	

Plumbing / Gas	WC-1 - Refer to Plumbing Fixture Schedules	LV-5 - Refer to Plumbing Fixture Schedules	FD-1 - Refer to Plumbing Fixture Schedules	-	- -
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- -	n/a Occupant Load	- 35 l/s to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting	1 Recessed down light 1 Wall Sconce	Occupancy Sensor Wall Pods	Emergency Lighting	30fc	-0.3 min/average -
Electrical / Power	N/A	1 Min. Receptacles	N/A	Plumbing fixtures	N/A
Aux. Systems / Communications – Security	0 Min. Data Outlets	N/A	N/A	- N/A -	- N/A -

General Activity	Universal washroom
Electrical / Power Notes	• Provide power to all plumbing and washroom fixtures as required. Confirm additional receptacle requirements or direct connections to low voltage relays.
Aux. Systems	•

Communications – Security Notes	
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Slope floors to drain • Provide doors with double swing hinges if layout requires recovery access function. • Coordinate door keying with school district • Provide Wood Door with Steel Frame.

Functional Area	Functional Unit
5.00 – GYM ANCILLARY SPACE	**5.08 – WC (Minimum 4m²)**

Overview: A washroom to be provided to accommodate in close proximity of the gym.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring
	Base	Epoxy Flash Cove
	Walls	Wall Tile
	Ceiling	Gypsum Board Drop Ceiling - Painted
Ceiling Height Minimum		2450mm
Millwork		
Equipment Provided By School District:		
Equipment Provided By Design Builder:		Provide 1 flush valve toilet, 1 t.p. disp, 1 sani disp, sink, 1 mirror, 1 soap dispenser, 1 electric hand dryer, 1 floor drain, 1 flush wall mounted garbage receptacle
Furniture Provided by School District:		

Plumbing / Gas	WC-1 - Refer to Plumbing Fixture Schedules	LV-5 - Refer to Plumbing Fixture Schedules	FD-1 - Refer to Plumbing Fixture Schedules	-	- -
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- -	n/a Occupant Load	- 35 l/s to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting	1 Recessed Potlight 1 Wall Sconce	Occupancy Sensor Wall Pods	Emergency Lighting	50fc	-0.3 min/average -
Electrical / Power	N/A	1 Min. Receptacles	N/A	Electric Hand Dryer	N/A
Aux. Systems / Communications – Security	0 Min. Data Outlets	N/A	N/A	- N/A -	- N/A -

General Activity	Universal washroom
Electrical / Power Notes	• Provide power to all plumbing and washroom fixtures as required. Confirm additional receptacle requirements or direct connections to low voltage relays. Provide power to all plumbing and washroom fixtures as required. Confirm additional receptacle

	requirements or direct connections to low voltage relays.
Aux. Systems Communications – Security Notes	•
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Slope floors to drain • Provide doors with double swing hinges if layout requires recovery access function. • Coordinate door keying with school district • Provide Wood Door with Steel Frame.

Functional Area	Functional Unit
5.00 – GYM ANCILLARY SPACE	**5.09 – PE INSTRUCTORS (Minimum 39m²)**

Overview:

The Staff Work Room will provide space for five Staff in an open office format
Provide two individual GN washroom facilities for physical education Staff accessible from within the Staff Work Room. Each washroom will include a lavatory, toilet and shower stall. One shower will be accessible.

Adjacencies:

The Staff Work Room will be adjacent to the Gym A and Gym B.
The Staff Work Room will be adjacent to Team Storage.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork		12xU-1 (9600mm total length), 2xL-5 (9600mm total length)				
Equipment Provided By School District:		, Provide 2 computer stations				
Equipment Provided By Design Builder:		Provide 1 stackable washer and dryer unit				
Furniture Provided by School District:		2 chairs, 1 round table				
Plumbing / Gas		LB-1 - Refer to Plumbing Fixture Schedules	TP-1 - Refer to Plumbing Fixture Schedules	- -	- -	- -
Mechanical		- Common to Gymnasium 4.03 and PE Instructors 5.09, roof mounted air handling unit, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount, vandal proof, temperature sensor (Non-adjustable)	- -	2 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	- Return air CO2 sensor for demand control ventilation **- Positive pressurization** - Acoustically lined ducted transfer air (non-ceiling plenum)				
Lighting	**Architectural 2x2 Recessed.**	**Occupancy Sensor** Daylight Sensor Wall Pods Dimming	Emergency Lighting	**50fc** -	**-0.6 min/average** -
Electrical / Power	**N/A**	**10** Min. Receptacles	**N/A**	**1 Washer** 1 Dryer	**- N/A**
Aux. Systems / Communications – Security	**5** Min. Data Outlet	1@2 data/WAP	Wall mounted telephone	**- PA SPKR. W/Vol. Control** -	**- N/A** -
General Activity	PE instructor office				
Electrical / Power Notes	• Provide power for computer stations. • Provide power for washer and dryer.				
Aux. Systems Communications – Security Notes	• Provide data for computer stations and telephones. • Provide data outlets for wireless access point (WAP).				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide full glazing with 0mm sill height between PE INSTRUCTORS 5.09 and CORRIDOR 24.02 • Provide Wood Doors with Steel Frames and vision panels.				

Functional Area	Functional Unit
5.00 – GYM ANCILLARY SPACE	**5.10 – SHWR (Minimum 9m²)**
Overview: A dedicated shower room to be provided in close proximity to the gym.	
Adjacencies: Refer to adjacency diagram.	
Finishes – Floor	Epoxy Flooring
Finishes – Base	Epoxy Flash Cove
Finishes – Walls	Wall Tile
Finishes – Ceiling	Gypsum Board Drop Ceiling - Painted
Ceiling Height Minimum	3050mm
Millwork	1xL-1a (700mm total length)
Equipment Provided By School District:	
Equipment Provided By Design Builder:	Provide 1 flush valve toilet, 1 sink, 1 mirror (700x1000), 1 soap disp, 1 electric hand dryer, 1 t.p. disp, 1 sani disp, 1 shower rod and curtain, 2 floor drains, 1 shower base with drain, 1 flush wall mount garbage receptacle
Furniture Provided by School District:	

Plumbing / Gas	WC-1 - Refer to Plumbing Fixture Schedules	LV-5 - Refer to Plumbing Fixture Schedules	FD-1 - Refer to Plumbing Fixture Schedules	SH-1 - Refer to Plumbing Fixture Schedules	- -
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- -	n/a Occupant Load	- 50 l/s to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting	Recessed down light Vanity Wall Sconce	Occupancy Sensor Wall Pods	Emergency Lighting	-30 fc	-0.3 min/average -
Electrical / Power	N/A -	2 Min. Receptacles	N/A	Plumbing fixtures.	N/A -
Aux. Systems / Communications – Security	0 Min. Data Outlets	N/A	N/A	- N/A -	- N/A -

General Activity	Shower Room
Electrical / Power Notes	• Provide one maintenance receptacle and one GFCI protected receptacle at sink. • Provide connections to all washroom fixtures including additional receptacles or connections to low voltage relays.

Aux. Systems Communications – Security Notes	•
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide Wood Door with Steel Frame. • Slope floors to drain. Provide 1 floor drain in the shower area, and 1 in the washroom area

Functional Area	Functional Unit
5.00 – GYM ANCILLARY SPACE	**5.11 – SHWR (Minimum 9m²)**

Overview: A dedicated shower room to be provided in close proximity to the gym.

Adjacencies: Refer to adjacency diagram.

Finishes – Floor	Epoxy Flooring
Base	Epoxy Flash Cove
Walls	Wall Tile
Ceiling	Gypsum Board Drop Ceiling - Painted
Ceiling Height Minimum	3050mm
Millwork	1xL-1a (700mm total length)
Equipment Provided By School District:	
Equipment Provided By Design Builder:	Provide 1 flush valve toilet, 1 sink, 1 mirror (700x1000), 1 soap disp, 1 electric hand dryer, 1 t.p. disp, 1 sani disp, 1 shower rod and curtain, 2 floor drains, 1 shower base with drain, 1 flush wall mount garbage receptacle
Furniture Provided by School District:	

Plumbing / Gas	WC-1 - Refer to Plumbing Fixture Schedules	LV-5 - Refer to Plumbing Fixture Schedules	FD-1 - Refer to Plumbing Fixture Schedules	SH-1 - Refer to Plumbing Fixture Schedules	-
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	-	n/a Occupant Load	- 50 l/s to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting	Recessed down lights 1 Wall Sconce	Occupancy Sensor Wall Pods	Emergency Lighting	-30 fc	-0.3 min/average
Electrical / Power	N/A	2 Min. Receptacles	N/A	Washroom fixtures	N/A
Aux. Systems / Communications – Security	0 Min. Data Outlets	N/A	N/A	- N/A	- N/A

General Activity	Shower Room
Electrical / Power Notes	• Provide one maintenance receptacle and one GFCI protected receptacle at sink. • Provide connections to all washroom fixtures including additional receptacles or connections to low voltage relays.
Aux. Systems Communications –	•

Security Notes	
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide Wood Door with Steel Frame. • Slope floors to drain. Provide 1 floor drain in the shower area, and 1 in the washroom area

Functional Area	Functional Unit
5.00 – GYM ANCILLARY SPACE	**5.12 – GYM STORAGE (Minimum 76m²)**

Overview:

One or two Gym Equipment Storage rooms to be provided and dedicated to Gym A/B and Gym C.
The Gym Equipment Storage room will be for storage of indoor gym equipment including sporting goods, mats, fitness equipment, apparatus, etc.
The room will be rectilinear and no less than 3m wide in any dimension

Adjacencies:

The Gym Equipment Storage room will be adjacent to the Gymnasium Activity Space.

Finishes	Floor	Epoxy Paint Sealer			
	Base	Epoxy Flash Cove			
	Walls	Painted Gypsum Board			
	Ceiling	Exposed Structure Above			
Ceiling Height Minimum		Exposed Structure Above			
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:		6 volleyball net stanchions 18 badminton net stanchions in the floor for stanchion storage			
Furniture Provided by School District:					
Plumbing / Gas		-	-	-	-
		-	-	-	-
Mechanical		- Heavy duty, hydronic, fan assisted heater - 50 w/m2 - Wall mount, vandal proof, temperature sensor (Non-adjustable)	- -	N/A Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		Lensed LED Strip light	Occupancy Sensor Wall Pods	Emergency Lighting	30 fc	-0.3 min/average -
Electrical / Power		N/A	4 Min. Receptacles	N/A	N/A	- N/A
Aux. Systems / Communications – Security		0 Min. Data Outlets	N/A	N/A	- PA SPKR. -	- N/A -
General Activity		Gym storage room				
Electrical / Power Notes		•				

Aux. Systems Communications – Security Notes	•
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide 2 Wood Doors with Steel Frames.

6.00 Learning Commons (Library)

Functional Area	Functional Unit
6.00 – LEARNING COMMONS (LIBRARY)	**6.01 – LEARNING COMMONS (Minimum 263m²)**

Overview:

The Learning Commons (Library) will be a contemporary architectural design, facilitating a range of library / learning functions. This will be a non-traditional library space.
The Learning Commons (Library) department will provide a diversity of resources and easy access to technology for all students.
The Circulation Desk will be the central access point for checking in and out library materials, and for seeking help.
The Stacks will be an area for movable and/or fixed library shelving for books, periodicals and other library materials.
Library shelving will be movable in central areas of the Learning Commons (Library), used to define distinct study areas.
Moveable library shelving will be no more than 1220mm high in central areas of the Learning Commons (Library).
Moveable shelving will be oriented back-to-back to provide deep flat surfaces for display of materials
Fixed library shelving at perimeter walls will be permanently installed, and no more than 1830mm high.
The total amount of library shelving for books will accommodate 300 linear metres of materials, with no materials stored on the top of shelving units.
The total amount of library shelving for periodicals will accommodate 10 linear metres of materials, with no materials stored on the top of shelving units. This will be arranged as a periodicals section of the library.
All library shelving will be arranged and/or secured for seismic purposes.

Adjacencies:

The Learning Commons (Library) will be centrally located, adjacent to the MultiPurpose Space and located along the School's major circulation route.
The Circulation Desk will be located to have oversight of the Learning Commons entry area.
The Circulation Desk will have sightlines to all areas within the Learning Commons.

Stacks will be clustered throughout Learning Commons to provide for learning communities, defined by architectural elements such as changes in flooring and ceiling elements.					
Finishes	**Floor** **Base** **Walls** **Ceiling**	**Carpet Tile Flooring** **Rubber Base** **Painted Gypsum Board** **Exposed Structure Above**			
Ceiling Height Minimum		**Exposed Structure Above**			
Millwork		**15xOS-1 (12m total length), 1 Librarian station with (1xAL-27, 1xAL-28, 1xAL29, 1xAL-30) total 3400mm length.**			
Equipment Provided By School District:		**Provide 54 rolling bookshelf units (915x300mm),**			
Equipment Provided By Design Builder:		**Provide 1 counter underneath the t.v. (305mm depth), 1 2445x1225 W.B. 1 wall mounted t.v. Provide minimum 15 computer stations for student access.** **2 WAP access points**			
Furniture Provided by School District:		**8 curved seats, 16 tables, 6 round tables, 48 chairs, 4 bean bags**			
Plumbing / Gas		- -	- -	- -	- -
Mechanical		**- Common to Learning Commons 6.01 and Work 6.02 roof mounted air handling unit, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount, vandal proof, temperature sensor (Non-adjustable)** **- Return air CO2 sensor for demand control ventilation** **- Positive pressurization**	- Exposed ductwork - Supply air to provide condensation resistance on windows	**347** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting		**Architectural linear. suspended. Architectural feature luminaires. Luminaire aircraft cables colour shall be**	**Occupancy Sensor** **Daylight sensor** Wall Pods Dimming	**Emergency Lighting**	**50 fc**	**-0.5 min/average** -

	selected for low visibility				
Electrical / Power	**N/A**	**15** Min. Receptacles	**N/A**	**N/A**	**4 Speakers** 1 TV **N/A**
Aux. Systems / Communications – Security	**5** Min. Data Outlets **6** Min. Data Outlets	**2@2 Data/WAP**	**N/A**	**- Two PA SPKR. W/Vol Control** -	**- Provide data and power for TVs as required. Provide presentation speakers.** -
General Activity	Library				
Electrical / Power Notes	• Lighting selections shall support contemporary architectural design in colour, shape and finish. • Provide power for all learning equipment, computers, and presentation electronics as required by SD23.				
Aux. Systems Communications – Security Notes	• Provide additional data outlets as required for computers, printers, TVs etc. as required by SD23. • Provide data connection for librarian phone.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide 2 Wood Doors with Steel Frames and vision panels.				

Functional Area	Functional Unit
6.00 – LEARNING COMMONS (LIBRARY)	6.02 – WORK (Minimum 18m²)

Overview:

The Learning Commons (Library) will be a contemporary architectural design, facilitating a range of library / learning functions. This will be a non-traditional library space.
The Learning Commons (Library) department will provide a diversity of resources and easy access to technology for all students.
The Circulation Desk will be the central access point for checking in and out library materials, and for seeking help.
The Stacks will be an area for movable and/or fixed library shelving for books, periodicals and other library materials.
Library shelving will be movable in central areas of the Learning Commons (Library), used to define distinct study areas.
Moveable library shelving will be no more than 1220mm high in central areas of the Learning Commons (Library).
Moveable shelving will be oriented back-to-back to provide deep flat surfaces for display of materials
Fixed library shelving at perimeter walls will be permanently installed, and no more than 1830mm high.
The total amount of library shelving for books will accommodate 300 linear metres of materials, with no materials stored on the top of shelving units.
The total amount of library shelving for periodicals will accommodate 10 linear metres of materials, with no materials stored on the top of shelving units. This will be arranged as a periodicals section of the library.
All library shelving will be arranged and/or secured for seismic purposes.

Adjacencies:

The Learning Commons (Library) will be centrally located, adjacent to the MultiPurpose Space and located along the School's major circulation route.
The Circulation Desk will be located to have oversight of the Learning Commons entry area.
The Circulation Desk will have sightlines to all areas within the Learning Commons.
Stacks will be clustered throughout Learning Commons to provide for learning communities, defined by architectural elements such as changes in flooring and ceiling elements.

Finishes **Floor** **Base** **Walls** **Ceiling**	**Resilient Flooring** **Rubber Base** **Painted Gypsum Board** **T-Bar (1220mm x 610mm)**				
Ceiling Height Minimum	**3050mm**				
Millwork	**6xU-1 (4800mm total length), 6xL-1a (4800mm total length)**				
Equipment Provided By School District:					
Equipment Provided By Design Builder:					
Furniture Provided by School District:					
Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	**- Common to Learning Commons 6.01 and Work 6.02 roof mounted air handling unit, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount, vandal proof, temperature sensor (Non-adjustable)** **- Return air CO2 sensor for demand control ventilation** **- Positive pressurization**	- -	**n/a** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	**Architectural 2x2 Recessed**	**Daylight Sensor** Dimming Occupancy Sensor	**Emergency Lighting**	**50 fc**	**-0.5 min/average**
Electrical / Power	**N/A**	**5** Min. Receptacles	**N/A**	**N/A**	**N/A**
Aux. Systems / Communications – Security	**2** Min. Data Outlets	**N/A**	**N/A**	**- N/A** -	**- N/A** -
General Activity	Library work room				
Electrical / Power Notes	• Provide maintenance receptacle.				
Aux. Systems Communications – Security Notes	• Provide data for printer/photocopier.				

Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide 1 Wood Door with Steel Frame and vision panel.

Functional Area	Functional Unit
6.00 – LEARNING COMMONS (LIBRARY)	**6.03 – BREAK-OUT (Minimum 15m²)**

Overview: A unique, quiet area within the Study Area will be designed and designated for listening to audio material, including those for traditional Indigenous languages.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Carpet Tile Flooring			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	T-Bar (1220mm x 610mm)			
Ceiling Height Minimum		3050mm			
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:					
Furniture Provided by School District:		Provide 8 chairs, 1 table			
Plumbing / Gas		-	-	-	-	-
Mechanical		- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1.1 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	-	8 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		3 2x4 Recessed	Occupancy Sensor	N/A	50 fc	-0.5 min/average

		Dimming			
Electrical / Power	**N/A**	**3** Min. Receptacles	**N/A**	**N/A**	**N/A**
Aux. Systems / Communications – Security	**2** Min. Data Outlets	**N/A**	**N/A**	- **PA SPKR. W/Vol. Control**	- N/A
General Activity	Collaboration room				
Electrical / Power Notes	•				
Aux. Systems Communications – Security Notes	•				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide 1 Aluminum Door with Aluminum Frame and vision panel. • Provide 1 Aluminum Door with Aluminum Frame and vision panel.				

Functional Area	Functional Unit
6.00 – LEARNING COMMONS (LIBRARY)	6.04 – LEARNING STAIRS (Minimum 106m²)

Overview: A common featured auditorium stairwell that allows students and staff to sit, read, eat their lunch, communicate with others, listen and to watch to lectures and so on.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Concrete Sealer			
	Base	n/a			
	Walls	Wood Feature Wall, Durable Decorative Feature Wall			
	Ceiling	Feature ceiling accents with gypsum board ceiling.			
Ceiling Height Minimum		varies			
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:		Provide TV Monitor and mount for students see the time and block rotation			
Furniture Provided by School District:					
Plumbing / Gas		-	-	-	-	-
		-	-	-	-	-
Mechanical		- Common to Multi-purpose 7.01 and Learning Stair 6.04, roof mounted air handling unit, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount, vandal proof, temperature sensor (Non-adjustable) - Return air CO2 sensor for demand control ventilation - Positive pressurization	- -	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

Lighting	Architectural feature lighting	**Daylight Sensor** Dimming	**Emergency Lighting**	**50 fc** -	**-0.6 min/average**
Electrical / Power	**N/A** -	**3** Min. Receptacles 15 USB Receptacles	**N/A**	**N/A**	**N/A** -
Aux. Systems / Communications – Security	**2** Min. Data Outlets	**2@2 data/WAP**	**0** Min. Cable Outlets	**- PA SPKR. W/Vol. Control**	**- Presentation speakers, AV equipment**
General Activity	Learning stairs access between first and second floor				
Electrical / Power Notes	• Generous distribution of USB C receptacles and power for laptops and tablets. Calculate circuiting requirements assuming 100W chargers.				
Aux. Systems Communications – Security Notes	• Provide AV equipment for learning events.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Where doors are provided, provide fully accessible doors into this space • East Wall: Provide aluminum curtainwall glazing full height and width of the room.				

7.00 Multi Purpose Space

Functional Area	Functional Unit
7.00 – MULTI-PURPOSE SPACE	**7.01 – MULTI-PURPOSE (Minimum 318m²)**

Overview:

The Multi-Purpose Space will be a central space and the largest gathering hub for the School.
The Multi-Purpose Space will provide table seating for students to eat, sit, work, and socialize. It will be a place for exhibitions and presentations.
The Assembly / Lounge / Dinging area will be a minimum double-height. Provide Direct Visual Connections between all levels of the entry Lobby and Multi-Purpose Space. This feature space serves as the central hub of the School.
The Assembly / Lounge / Dining area will be a single open space.
The Assembly / Lounge / Dining area will house a central feature stair (the "Gathering Stair"). This stair will accommodate 60 people, seated on terraces, with a width of 900mm minimum per person.
The Gathering Stair will include a code-compliant access stair to the second level.
Across from the Gathering Stair, will be a large, wall-mounted LCD Display with associated power, network and power connections used for presentations.
The Multi-purpose room will feature wood columns and beams supporting the roof, and a wood feature wall at the learning stair.

Adjacencies:

The Assembly / Lounge / Dining area will be within 25m of the main entrance of the School, measured along the path of travel from the entry to the edge of the space.
The Assembly / Lounge / Dining area will have direct adjacency to the Drama room and Learning Commons.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board, Wood Columns, Wood Feature Wall
	Ceiling	Exposed Structure Above, Wood Beams
Ceiling Height Minimum		Exposed Structure Above
Millwork		5xL-1a, 5xU-1, 3 shelving units, 1xL-5a; total length of millwork to be 11m.

Equipment Provided By School District:					
Equipment Provided By Design Builder:	**Provide 1 sink, Provide 1 full size refrigerator / freezer, 1 coffee machine** **Provide TV Monitor and mount for students see the time and block rotation**				
Furniture Provided by School District:	**32 chairs, 6 round tables, 4 sofas, 2 side tables**				
Plumbing / Gas	**SK-9** **- Refer to Plumbing Fixture Schedules**	**-** -	**-** -	**-** -	**-** -
Mechanical	**- Common to Multi-purpose 7.01 and Learning Stair 6.04, roof mounted air handling unit, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount, vandal proof, temperature sensor (Non-adjustable)** **- Return air CO2 sensor for demand control ventilation** **- Positive pressurization**	**-** Exposed ductwork - Supply air to provide condensation resistance on windows	**32** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	Suspended architectural feature pendants	**Daylight Sensor** Dimming Wall pod	Emergency Light Emergency Lighting Exit lights	**50fc** -	**-0.4 min/average**
Electrical / Power	**N/A** -	**13** Min. Receptacles	TV	**Kitchen appliances** Water Fountain	
Aux. Systems / Communications – Security	**1** Min. Data Outlets	**2@2 data/WAP**		**- PA SPKR**	**- Large scale TV**
General Activity	Multi-purpose area				
Electrical / Power Notes	• Provide connections for all kitchen appliances • Provide connection to water fountain/bottle fill station				
Aux. Systems Communications –	• Provide TV media box				

Security Notes	
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide 2 Aluminum Doors with Aluminum Frames and vision panels. • Provide full height and width aluminum curtainwall glazing to the exterior view.

8.00 Special Education / Inclusive Education

Functional Area	Functional Unit
8.00 – SPECIAL EDUCATION / INCLUSIVE EDUCATION	**8.01 – INDIGENOUS SUPPORT (Minimum 40m²)**
Overview: The Indigenous Education department will be a place for students to seek support, create belonging and create a welcoming community with an all-nations common area. The Indigenous Education Room will be made up of the Flex Area, Reading Area The Flex Area will be a rectangular open space. The Flex Area will accommodate cultural activities such as cedar weaving, beading, drumming, artwork, meal sharing and smudging	
Adjacencies: The Indigenous Education Room will be centrally located and accessible to all students within the School. The Indigenous Education Room will be accessed from the School's main circulation. Indigenous support rooms shall be in close proximity to 9.00 – Indigenous however it is not desired that the rooms be interconnected.	
Finishes – Floor	Resilient Flooring
Finishes – Base	Rubber Base
Finishes – Walls	Painted Gypsum Board
Finishes – Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum	2750mm
Millwork	
Equipment Provided By School District:	
Equipment Provided By Design Builder:	Provide TV Monitor and mount for students see the time and block rotation

Furniture Provided by School District:					
Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**	- -	**n/a** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	**8 2x2 Recessed**	**Occupancy Sensor** Wall Pods Dimming	Emergency lighting	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A**	**6** Min. Receptacles		-	-
Aux. Systems / Communications – Security	**4** Min. Data Outlets		1@2 data/WAP	**- PA SPKR c/w volume control**	- -
General Activity	Support Room Access				
Electrical / Power Notes	• Provide outlets for work stations				
Aux. Systems Communications – Security Notes	• Provide wireless access point • Provide data outlets for work stations				
Special Requirements	• Acoustic separations between adjacent rooms • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

	• Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
8.00 – SPECIAL EDUCATION / INCLUSIVE EDUCATION	**8.02 – SUPPORT (Minimum 11m²)**

Overview:

The Enclosed Office will provide a private office for four persons including space for four workstations. This space is intended to be used by indigenous advocates and / or teacher tutors.

Adjacencies:

8.02 – Support will be adjacent to 8.01 – Indigenous support.

Finishes	Floor	Carpet Tile
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		2750mm
Millwork		
Equipment Provided By School District:		
Equipment Provided By Design Builder:		Provide data, phone, and power for 4 computer stations with mounting hardware
Furniture Provided by School District:		Provide data, phone, and power for 1 computer station with mounting hardware

Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	- Common fan coil with adjacent interior offices, heating/cooling, MERV 13 filtration - High supply, low level return, L45 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room	- -	2 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	temperature sensor with user interface **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**				
Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Daylight Sensor Dimming	**N/A**	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A**	**3** Min. Receptacles	**N/A** -	**N/A** -	**- N/A**
Aux. Systems / Communications – Security	**2** Min. Data Outlets	**N/A**	**N/A**	**- PA SPKR. W/Vol. Control** -	**- N/A** -
General Activity	Support Room				
Electrical / Power Notes	• Provide power for work stations.				
Aux. Systems Communications – Security Notes	• Provide data for work stations.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Aluminum Door with Aluminum Frame and vision panel.				

Functional Area	Functional Unit
8.00 – SPECIAL EDUCATION / INCLUSIVE EDUCATION	**8.03 – SUPPORT (Minimum 11m²)**

Overview:

The Enclosed Office will provide a private office for four persons including space for four workstations. This space is intended to be used by indigenous advocates and / or teacher tutors.

Adjacencies:

8.03 – Support will be adjacent to 8.01 – Indigenous support.

Finishes	Floor	Carpet Tile				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		2750mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common fan coil with adjacent interior offices, heating/cooling, MERV 13 filtration - High supply, low level return, 1.45 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation	-	2 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	- Positive pressurization **- Acoustically lined ducted transfer air (non-ceiling plenum)**				
Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Daylight Sensor Dimming	**N/A**	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A**	**3** Min. Receptacles	**N/A** -	**N/A** -	**- N/A**
Aux. Systems / Communications – Security	**2** Min. Data Outlets	**N/A**	**N/A**	**- PA SPKR. W/Vol. Control** -	**- N/A** -
General Activity	Support Room				
Electrical / Power Notes	• Provide power for work stations.				
Aux. Systems Communications – Security Notes	• Provide data for work stations.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Aluminum Door with Aluminum Frame and vision panel.				

Functional Area	Functional Unit
8.00 – SPECIAL EDUCATION / INCLUSIVE EDUCATION	**8.04 – SUPPORT (Minimum 11m²)**

Overview:

The Enclosed Office will provide a private office for four persons including space for four workstations. This space is intended to be used by indigenous advocates and / or teacher tutors.

Adjacencies:

. 8.04 – Support will be adjacent to 8.01 – Indigenous support.

Finishes	Floor	Carpet Tile				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		2750mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common fan coil with adjacent interior offices, heating/cooling, MERV 13 filtration - High supply, low level return, 1.45 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation	-	2 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	- Positive pressurization **- Acoustically lined ducted transfer air (non-ceiling plenum)**				
Lighting	**2 2x2 Recessed**	**Occupancy Sensor** Daylight Sensor Dimming	**N/A**	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A**	**3** Min. Receptacles	**N/A** -	**N/A** -	**N/A** -
Aux. Systems / Communications – Security	**2** Min. Data Outlets	**N/A**	**N/A**	**- PA SPKR. W/Vol. Control** -	**- N/A** -
General Activity	Support Room				
Electrical / Power Notes	• Provide power for work stations.				
Aux. Systems Communications – Security Notes	• Provide data for work stations.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Aluminum Door with Aluminum Frame and vision panel.				

Functional Area	Functional Unit
8.00 – SPECIAL EDUCATION / INCLUSIVE EDUCATION	**8.05 – SUPPORT (Minimum 11m²)**

Overview:

The Enclosed Office will provide a private office for four persons including space for four workstations. This space is intended to be used by indigenous advocates and / or teacher tutors.

Adjacencies:

8.05 – Support will be adjacent to 8.01 – Indigenous support.

Finishes	Floor	Carpet Tile				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		2750mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common fan coil with adjacent exterior offices, heating/cooling, MERV 13 filtration - High supply, low level return, 1.45 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation	-	2 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	- Positive pressurization **- Acoustically lined ducted transfer air (non-ceiling plenum)**				
Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Daylight Sensor Dimming	**N/A**	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A**	**3** Min. Receptacles	**N/A** -	**N/A** -	**- N/A**
Aux. Systems / Communications – Security	**2** Min. Data Outlets	**N/A**	**N/A**	**- PA SPKR. W/Vol. Control** -	**- N/A** -
General Activity	Support Room				
Electrical / Power Notes	• Provide power for work stations.				
Aux. Systems Communications – Security Notes	• Provide data for work stations.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Aluminum Door with Aluminum Frame and vision panel.				

Functional Area	Functional Unit
8.00 – SPECIAL EDUCATION / INCLUSIVE EDUCATION	**8.06 – SUPPORT (Minimum 12m²)**

Overview:
These areas are intended to provide learning spaces to deliver programs for vulnerable learners in both group and individual settings. This space is to be an enclosed private meeting room complete with full height glazing.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Carpet Tile				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide accordion door between support rooms, 1 2445x1225 W.B.				
Furniture Provided by School District:		Provide 8 chairs, 1 table				
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common fan coil with adjacent Support 8.07, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation	-	8 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	- Positive pressurization **- Acoustically lined ducted transfer air (non-ceiling plenum)**				
Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Daylight Sensor Dimming	**N/A**	**50 fc** -	**-0.5 min/average**
Electrical / Power	**N/A**	**3** Min. Receptacles	**N/A** -	**N/A** -	- N/A
Aux. Systems / Communications – Security	**1** Min. Data Outlets	**N/A**	**N/A**	**-** PA SPKR. W/Vol. Control -	**- TV** -
General Activity	Collaboration room				
Electrical / Power Notes	•				
Aux. Systems Communications – Security Notes	•				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide Aluminum Door with Aluminum Frame and vision panels. •				

Functional Area	Functional Unit
8.00 – SPECIAL EDUCATION / INCLUSIVE EDUCATION	**8.07 – SUPPORT (Minimum 12m²)**

Overview:
These areas are intended to provide learning spaces to deliver programs for vulnerable learners in both group and individual settings. This space is to be an enclosed private meeting room complete with full height glazing.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Carpet Tile				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide accordion door between support rooms, 1 2445x1225 W.B.				
Furniture Provided by School District:		Provide 8 chairs, 1 table				
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common fan coil with adjacent Support 8.06, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation	-	8 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	- Positive pressurization **- Acoustically lined ducted transfer air (non-ceiling plenum)**				
Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Daylight Sensor Dimming	**N/A**	**50 fc** -	**-0.5 min/average** -
Electrical / Power	**N/A**	**4** Min. Receptacles	**N/A** -	**N/A** -	**- N/A**
Aux. Systems / Communications – Security	**1** Min. Data Outlets	N/A	N/A	**- PA SPKR. W/Vol Control** -	**- TV** -
General Activity	Collaboration room				
Electrical / Power Notes	•				
Aux. Systems Communications – Security Notes	•				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide Aluminum Door with Aluminum Frame and vision panels.				

Functional Area	Functional Unit
8.00 – SPECIAL EDUCATION / INCLUSIVE EDUCATION	**8.08 – SUPPORT (Minimum 12m²)**

Overview:
These areas are intended to provide learning spaces to deliver programs for vulnerable learners in both group and individual settings. This space is to be an enclosed private meeting room complete with full height glazing.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Carpet Tile				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide accordion door between support rooms				
Furniture Provided by School District:		Provide 8 chairs, 1 table				
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common fan coil with adjacent Support 8.09, heating/cooling, MERV 13 filtration - High supply, low level return, 1.8 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization	-	8 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	- Acoustically lined ducted transfer air (non-ceiling plenum)				
Lighting	Architectural 2x2 Recessed	Occupancy Sensor Dimming	N/A	50 fc -	-0.5 min/average -
Electrical / Power	N/A	4 Min. Receptacles	N/A	N/A	N/A
Aux. Systems / Communications – Security	1 Min. Data Outlets	N/A	N/A	- PA SPKR. W/Vol. Control	- TV
General Activity	Collaboration room				
Electrical / Power Notes	•				
Aux. Systems Communications – Security Notes	•				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide Aluminum Door with Aluminum Frame and vision panels.				

Functional Area	Functional Unit
8.00 – SPECIAL EDUCATION / INCLUSIVE EDUCATION	**8.09 – SUPPORT (Minimum 12m²)**

Overview:
These areas are intended to provide learning spaces to deliver programs for vulnerable learners in both group and individual settings. This space is to be an enclosed private meeting room complete with full height glazing.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Carpet Tile				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide accordion door between support rooms				
Furniture Provided by School District:		Provide 8 chairs, 1 table				
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common fan coil with adjacent Support 8.08, heating/cooling, MERV 13 filtration - High supply, low level return, 1.8 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization	-	8 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	- Acoustically lined ducted transfer air (non-ceiling plenum)				
Lighting	**3 2x2 Recessed**	**Occupancy Sensor** Daylight Sensor Dimming	**N/A**	**50 fc** -	**-0.5 min/average**
Electrical / Power	**N/A**	**4** Min. Receptacles	**N/A**	**N/A**	**1 Speaker**
Aux. Systems / Communications – Security	**1** Min. Data Outlets	**N/A**	**N/A**	**- PA SPKR. W/Vol. Control**	**- TV**
General Activity	Collaboration room				
Electrical / Power Notes	•				
Aux. Systems Communications – Security Notes	•				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide Aluminum Door with Aluminum Frame and vision panels. •				

Functional Area	Functional Unit
8.00 – SPECIAL EDUCATION / INCLUSIVE EDUCATION	**8.10 – RESOURCE (Minimum 68m²)**

Overview:
These areas are intended to provide learning spaces to deliver programs for vulnerable learners in both group and individual settings.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		2750mm				
Millwork		1xHC-1, 2xHC-2, 2xHC-3, 1xHC-4, 1xHC-5, 2xU-1, 1xU-3; total kitchenette length to be 5000mm.				
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide 1 305mm counter under t.v., 1 double sink, 1 cooktop, 1 wall mounted t.v., 1 refrigerator, 1 wall oven, 1 microwave				
Furniture Provided by School District:		Provide 12 chairs, 3 tables				
Plumbing / Gas		SK-5 - Refer to Plumbing Fixture Schedules	Connect to equipment provided by owner	- -	- -	- -
Mechanical		- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1.12 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation	- -	8 Occupant Load	- Range hood - Exhaust to discharge at roof level	- Light hazard occupancy fire protection

	- Positive pressurization **- Acoustically lined ducted transfer air (non-ceiling plenum)**				
Lighting	**2x2 indirect low glare recessed luminaires**	**Occupancy Sensor** Wall Pods Dimming	**Emergency Lighting**	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A**	**10** Min. Receptacles	**N/A**	**Kitchen appliances**	
Aux. Systems / Communications – Security	**2** Min. Data Outlets	**1@2 data/WAP**	**1** Wall mounted telephone	**- PA SPKR c/w volume control** -	**- TV media box** -
General Activity	Resource room				
Electrical / Power Notes	• Provide connections to all kitchen appliances • Provide kitchen counter receptacles				
Aux. Systems Communications – Security Notes	• Provide television media box				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame.				

Functional Area	Functional Unit
8.00 – SPECIAL EDUCATION / INCLUSIVE EDUCATION	**8.11 – WASHROOM (Minimum 20m²)**

Overview:

The Change Room / WC will provide a fully accessible washroom including shower, toilet and sink

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring
	Base	Epoxy Flash Cove
	Walls	Wall Tile
	Ceiling	Gypsum Board Drop Ceiling - Painted
Ceiling Height Minimum		3050mm
Millwork		2xL-1a, 2xU-1; total unit length to be 1600mm.
Equipment Provided By School District:		
Equipment Provided By Design Builder:		Provide 1 flush valve toilet, 1 H/C grab bar corner unit, 1 t.p. disp, 1 sani disp, 1 h/c shelf, 1 H/C sink, 1 H/C tilt mirror, 1 soap dispenser, 1 electric hand dryer, 1 floor drain, 1 coat hook on back of door, 2 wall hung hinged grab bars, 1 H/C accessible shower with grab bars and bench, ceiling lift track from change table to shower to toilet, 1 adjustable height fold down change table, 1 flush wall mount garbage receptacle
Furniture Provided by School District:		

	WC-1	LV-5	FD-1	CM-1	SH-3
Plumbing / Gas	- Refer to Plumbing Fixture Schedules	- Refer to Plumbing Fixture Schedules	- Refer to Plumbing Fixture Schedules	- Refer to Plumbing Fixture Schedules	- Refer to Plumbing Fixture Schedules
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- -	n/a Occupant Load	- 50 l/s to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting	2x2 indirect low glare recessed luminaires	Occupancy Sensor Wall Pods	Emergency Lighting	30 fc -	- -
Electrical / Power	N/A	4 Min. Receptacles	N/A	Powered washroom fixtures Ceiling track lift	N/A

Aux. Systems / Communications – Security	0 Min. Data Outlets			- **Panic system** -	- -
General Activity	Universal H/C washroom				
Electrical / Power Notes	• Provide connection to ceiling track lift • Provide connection to lavatory fixtures				
Aux. Systems Communications – Security Notes	• Provide panic system including all components such as but not limited to pull cords, dome light, audible indicator and connection to reception				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide Wood Door with Steel Frame. • Slope floors to drain				

Functional Area	Functional Unit
8.00 – SPECIAL EDUCATION / INCLUSIVE EDUCATION	**8.12 – SUPPORT (Minimum 12m²)**

Overview:
These areas are intended to provide learning spaces to deliver programs for vulnerable learners in both group and individual settings. This space is to be an enclosed private meeting room complete with full height glazing.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Carpet Tile				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide accordion door between support rooms, 1 2445x1225 W.B.				
Furniture Provided by School District:		Provide 8 chairs, 1 table				
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common fan coil with adjacent Support 8.13, heating/cooling, MERV 13 filtration - High supply, low level return, 1.8 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation	-	8 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	- Positive pressurization **- Acoustically lined ducted transfer air (non-ceiling plenum)**				
Lighting	**Architectural 2x2 Recessed** -	**Occupancy Sensor** Dimming	**N/A**	**50 fc**	**-0.5 min/average**
Electrical / Power	**N/A**	**4** Min. Receptacles	**N/A**	**N/A** -	**N/A**
Aux. Systems / Communications – Security	**1** Min. Data Outlet	**N/A**	**N/A**	**- PA SPKR. W/Vol. Control** -	**-** -
General Activity	Collaboration room				
Electrical / Power Notes	•				
Aux. Systems Communications – Security Notes	•				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide Aluminum Door with Aluminum Frame and vision panels. •				

Functional Area	Functional Unit
8.00 – SPECIAL EDUCATION / INCLUSIVE EDUCATION	**8.13 – SUPPORT (Minimum 12m²)**

Overview:
These areas are intended to provide learning spaces to deliver programs for vulnerable learners in both group and individual settings. This space is to be an enclosed private meeting room complete with full height glazing.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Carpet Tile				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide accordion door between support rooms, 1 2445x1225 W.B.				
Furniture Provided by School District:		Provide 8 chairs, 1 table				
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common fan coil with adjacent Support 8.12, heating/cooling, MERV 13 filtration - High supply, low level return, 1.8 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation	-	8 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	- Positive pressurization **- Acoustically lined ducted transfer air (non-ceiling plenum)**				
Lighting	**Architectural 2x2 Recessed** -	**Occupancy Sensor** Daylight Sensor Dimming	**N/A**	**50 fc** -	**-0.5 min/average**
Electrical / Power	**N/A**	**4** Min. Receptacles	**N/A**	**N/A** -	**N/A**
Aux. Systems / Communications – Security	**1** Min. Data Outlet	**N/A**	**N/A**	**- N/A** -	**- TV**
General Activity	Collaboration room				
Electrical / Power Notes	•				
Aux. Systems Communications – Security Notes	•				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide Aluminum Door with Aluminum Frame and vision panels.				

Functional Area	Functional Unit
8.00 – SPECIAL EDUCATION / INCLUSIVE EDUCATION	**8.14 – CAREERS (Minimum 16m²)**

Overview:
These areas are intended to provide learning spaces to deliver programs for vulnerable learners in both group and individual settings. This space is to be an enclosed private meeting room complete with full height glazing.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		- -	- -	- -	- -	- -
Mechanical		- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted	- -	8 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	transfer air (non-ceiling plenum)				
Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Dimming	**N/A**	**50 fc** -	**-0.5 min/average** -
Electrical / Power	**N/A**	**4** Min. Receptacles	**N/A**	**N/A**	**N/A**
Aux. Systems / Communications – Security	**2** Min. Data Outlets	**N/A**	**N/A**	**- PA SPKR. W/Vol. Control**	**- N/A**
General Activity	Collaboration room				
Electrical / Power Notes	• Provide power for minimum one workstation.				
Aux. Systems Communications – Security Notes	• Provide data for telephone and workstation.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide Aluminum Door with Aluminum Frame and vision panels.				

Functional Area	Functional Unit
8.00 – SPECIAL EDUCATION / INCLUSIVE EDUCATION	**8.15 – LEARNING ASSISTANCE (Minimum 93m²)**

Overview:

These areas are intended to provide learning spaces to deliver programs for vulnerable learners in both group and individual settings.
The areas will be integrated into the fabric of the School and not isolated. These areas will be located as integral programs within the Learning Communities.
Special Education / Inclusive Education areas will be located away from the Gymnasium Activity Space.
Programs will range from Life Skills Occupational Therapy situations to delivering assisted learning support for gaining independence in all areas of a student's life.
Programs will support a range of student's needs, including physical, sensory or cognitive challenges.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1.25 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor),	-	8 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	air outlets <20 NC **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**				
Lighting	**Indirect lighting**	**Occupancy Sensor** Wall Pods Dimming	Emergency lighting	**50 fc** -	**-0.6 min/average**
Electrical / Power	- -	**See Notes**	**- N/A** -	**- N/A** -	**- N/A** -
Aux. Systems / Communications – Security	**See notes** Min. Data Outlet	1@2data/WAP	Wall mounted telephone	**- PA SPKR. W/Vol. Control** -	**- See notes** -
General Activity	Collaboration room				
Electrical / Power Notes	• Provide power throughout for office space, millwork, maintenance, appliances, etc.				
Aux. Systems Communications – Security Notes	• Provide data as required for telephone, office space, TV, printer, etc. as required.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

Functional Area	Functional Unit
8.00 – SPECIAL EDUCATION / INCLUSIVE EDUCATION	**8.16 – SUPPORT (Minimum 12m²)**

Overview:
These areas are intended to provide learning spaces to deliver programs for vulnerable learners in both group and individual settings. This space is to be an enclosed private meeting room complete with full height glazing.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Carpet Tile				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide accordion door between support rooms				
Furniture Provided by School District:		Provide 8 chairs, 1 table				
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common fan coil with adjacent Support 8.17, heating/cooling, MERV 13 filtration - High supply, low level return, 1.8 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for	-	8 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)				
Lighting	**Architectural 2x2 Recessed.**	**Occupancy Sensor** Dimming	**N/A**	**50 fc** -	**-0.5 min/average** -
Electrical / Power	**N/A**	**4** Min. Receptacles	**N/A**	**N/A** -	**N/A**
Aux. Systems / Communications – Security	**1** Min. Data Outlet	**N/A**	**N/A**	**- PA SPKR. W/Vol. Control** -	**- TV** -
General Activity	Collaboration room				
Electrical / Power Notes	•				
Aux. Systems Communications – Security Notes	•				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide Aluminum Door with Aluminum Frame and vision panels.				

Functional Area	Functional Unit
8.00 – SPECIAL EDUCATION / INCLUSIVE EDUCATION	**8.17 – SUPPORT (Minimum 12m²)**

Overview:
These areas are intended to provide learning spaces to deliver programs for vulnerable learners in both group and individual settings. This space is to be an enclosed private meeting room complete with full height glazing.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Carpet Tile				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide accordion door between support rooms				
Furniture Provided by School District:		Provide 8 chairs, 1 table				
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common fan coil with adjacent Support 8.16, heating/cooling, MERV 13 filtration - High supply, low level return, 1.8 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization	-	8 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	- Acoustically lined ducted transfer air (non-ceiling plenum)				
Lighting	**Architectural 2x2 Recessed.**	**Occupancy Sensor** Dimming	**Occupancy Sensor** Wall Pods Dimming	50 fc	**0.5 min/average** -
Electrical / Power	**- N/A** -	**4** Min. Receptacles	N/A-	**N/A**-	**N/A** -
Aux. Systems / Communications – Security	**1** Min. Data Outlet	**N/A**	N/A	**-** N/A	**- TV**
General Activity	Collaboration room				
Electrical / Power Notes	•				
Aux. Systems Communications – Security Notes	•				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide Aluminum Door with Aluminum Frame and vision panels. •				

Functional Area	Functional Unit
8.00 – SPECIAL EDUCATION / INCLUSIVE EDUCATION	**8.18 – SUPPORT (Minimum 48m²)**

Overview:
These areas are intended to provide learning spaces to deliver programs for vulnerable learners in both group and individual settings. This space is to be an enclosed private meeting room complete with full height glazing.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		Not shown				
Mechanical		Not shown				
Lighting		- -	- -	Yes Emergency Light	- -	- -
Electrical / Power		- -	2 Min. Receptacles	- -	- -	- -
Aux. Systems / Communications – Security		1 Min. Data Outlet	1 Min. Tel. Outlet	1 Min. Cable Outlet	- -	- -
General Activity		Collaboration room				
Electrical / Power Notes		•				
Aux. Systems Communications – Security Notes		•				
Special Requirements		• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls				

	• Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Aluminum Door with Aluminum Frame and vision panels.

9.00 Indigenous Education

Functional Area		Functional Unit				
9.00 – INDIGENOUS EDUCATION		**9.0 – INDIGENOUS (Minimum 98m²)**				
Overview: The Indigenous Language & Culture Centre department will be the heart of the School. It provides an opportunity to support and witness intergenerational cultural learning.						
Adjacencies: Refer to adjacency diagram.						
Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board, Wood Columns				
	Ceiling	Wood Ceiling Finishes				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1.25 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- Exposed ductwork - Supply air to provide condensation resistance on windows	32 Occupant Load	- Smudging exhaust, 8 air changes per hour - Exhaust to discharge at roof level - Exhaust air intake to be designed to <40 dB during normal operation	- Light hazard occupancy fire protection

Lighting	- Architectural lighting in ground/ceiling/wall to highlight architectural features as well as any art/displays -	- Dimming Scenes Wall Pod -	Emergency Lighting	-30 fc -	-0.6 min/average -
Electrical / Power	- -	6 Min. Receptacles	- -	- Exhaust fan manual control	- -
Aux. Systems / Communications – Security		1@2 data/WAP	Wall mounted telephone	- PA SPKR c/w volume control -	- -
General Activity	Circular shaped Indigenous room				
Electrical / Power Notes	• Provide connection to all room specific HVAC equipment				
Aux. Systems Communications – Security Notes	•				
Special Requirements	• Location to be near the front main entrance. This space is to compliment the main entry and is to be a feature architectural element. • The main space is to be round complete with Round vertical poles. If possible, feature poles are to be sourced from a local artist. The space shall be designed for minimum of 40 people. • Within the round space, ventilation to be provided for daily smudging practices and group gatherings. • Local indigenous culture to be displayed and showcased throughout the space. Pedagogy of water is an important element. • Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide Aluminum Door with Aluminum Frame and vision panels. • A separate private exterior access to be provided. Access to lead to exterior garden and outdoor learning space. Outdoor garden to feature Sage planting. • The room will feature round wood columns and a wood ceiling.				

10.00 Computer Rooms

Functional Area	Functional Unit				
10.00 – COMPUTER ROOMS	**10.01 – BUSINESS EDUCATION (Minimum 105m²)**				
Overview: A learning space dedicated to teach business like courses, subjects and scenarios.					
Adjacencies: Refer to adjacency diagram.					
Finishes — Floor	Resilient Flooring				
Base	Rubber Base				
Walls	Painted Gypsum Board				
Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum	3050mm				
Millwork	1xL-1a; 630mm in length.				
Equipment Provided By School District:					
Equipment Provided By Design Builder:	Provide 1 305mm deep counter below the t.v., 2 2445x1225 W.B., ED. 10.02, 1 wall mounted t.v. Provide data, phone, and power for 1 teacher's desk				
Furniture Provided by School District:	Provide 15 tables, 30 chairs, 1 teacher's desk and chair				
Plumbing / Gas	-	-	-	-	-
Mechanical	- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation	-	32 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	- Positive pressurization **- Acoustically lined ducted transfer air (non-ceiling plenum)**				
Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A**	**8** Min. Receptacles		**N/A** -	**N/A**
Aux. Systems / Communications – Security	**5** Min. Data Outlets	**1@2 data/WAP**	**Wall mounted telephone**	**- PA SPKR. W/Vol Control** -	**- TV** Speakers -
General Activity	Business education room				
Electrical / Power Notes	• Provide teacher station with AV controls. •				
Aux. Systems Communications – Security Notes	• Provide 1 wall mounted telephone at room entrance				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide Wood Door with Steel Frame and vision panel. • Provide corner guards at all exterior corners of interior walls				

Functional Area	Functional Unit
10.00 – COMPUTER ROOMS	**10.02 – BUSINESS EDUCATION (Minimum 105m²)**

Overview: A learning space dedicated to teach business like courses, subjects and scenarios.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork		1xL-1a; 630mm in length.				
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide 1 305mm deep counter below the t.v., 2 2445x1225 W.B., Provide 1 wall mounted t.v.				
Furniture Provided by School District:		Provide 15 tables, 30 chairs, 1 teacher's desk and chair				
Plumbing / Gas		-	-	-	-	-
Mechanical		- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	-	32 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average**
Electrical / Power	**N/A**	**8** Min. Receptacles		**N/A** -	**N/A**
Aux. Systems / Communications – Security	**5** Min. Data Outlets	**1@2 data/WAP**	**Wall mounted telephone**	**- PA SPKR W/Vol. Control**	**-** TV Speakers
General Activity	Business education room				
Electrical / Power Notes	• Provide teacher station with AV controls. •				
Aux. Systems Communications – Security Notes	• Provide 1 wall mounted telephone at room entrance •				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide Wood Door with Steel Frame and vision panel. • Provide corner guards at all exterior corners of interior walls				

Functional Area	Functional Unit
10.00 – COMPUTER ROOMS	**10.03 – BUSINESS EDUCATION (Minimum 105m²)**

Overview: A learning space dedicated to teach business like courses, subjects and scenarios.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork		1xL-1a; 630mm in length.				
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide 1 305mm deep counter below the t.v., 2 2445x1225 W.B., 1 top hung operable wall between adjacent computer room, Provide 1 wall mounted t.v. Provide data, phone, and power for 1 teacher's desk				
Furniture Provided by School District:		Provide 15 tables, 30 chairs, 1 teacher's desk and chair				
Plumbing / Gas		-	-	-	-	-
Mechanical		- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization	-	32 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	- Acoustically lined ducted transfer air (non-ceiling plenum)				
Lighting	**Architectural 2x2 Recessed.**	**Occupancy Sensor** **Daylight Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average**
Electrical / Power	**N/A** -	**8** Min. Receptacles		**N/A** -	**N/A**
Aux. Systems / Communications – Security	**5** Min. Data Outlet	**1@2 data/WAP**	**Wall mounted telephone**	**- PA SPKR W/Vol. Control** -	**- TV** Speakers -
General Activity	Business education room				
Electrical / Power Notes	• Provide teacher station with AV controls. • Provide operable partition.				
Aux. Systems Communications – Security Notes	• Provide 1 wall mounted telephone at room entrance •				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide Wood Door with Steel Frame and vision panel. • Provide corner guards at all exterior corners of interior walls				

Functional Area	Functional Unit
10.00 – COMPUTER ROOMS	**10.04 – BUSINESS EDUCATION (Minimum 105m²)**

Overview: A learning space dedicated to teach business like courses, subjects and scenarios.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork		1xL-1a; 630mm in length.				
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide 1 305mm deep counter below the t.v., 2 2445x1225 W.B., 1 top hung operable wall between adjacent computer room, Provide 1 wall mounted t.v. Provide data, phone, and power for 1 teacher's desk				
Furniture Provided by School District:		Provide 15 tables, 30 chairs, 1 teacher's desk and chair				
Plumbing / Gas		-	-	-	-	-
Mechanical		- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization	-	32 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	- Acoustically lined ducted transfer air (non-ceiling plenum)				
Lighting	**Architectural 2x2 Recessed.**	**Occupancy Sensor** **Daylight Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A** -	**8** Min. Receptacles		**N/A** -	**N/A**
Aux. Systems / Communications – Security	**5** Min. Data Outlet	**1@2 data/WAP**	**Wall mounted telephone**	**- PA SPKR. W/Vol Control** -	**-** TV Speakers
General Activity	Business education room				
Electrical / Power Notes	• Provide teacher station with AV controls. • Provide operable partition.				
Aux. Systems Communications – Security Notes	• Provide 1 wall mounted telephone at room entrance •				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide Wood Door with Steel Frame and vision panel. • Provide corner guards at all exterior corners of interior walls				

Functional Area	Functional Unit
10.00 – COMPUTER ROOMS	**10.05 – BUSINESS EDUCATION (Minimum 85m²)**

Overview: A learning space dedicated to teach business like courses, subjects and scenarios.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	T-Bar (1220mm x 610mm)			
Ceiling Height Minimum		3050mm			
Millwork		1xL-1a; 630mm in length.			
Equipment Provided By School District:					
Equipment Provided By Design Builder:		Provide 1 wall mounted t.v., 1 305mm deep counter below the t.v., 2 2445x1225 W.B., 1 top hung operable wall between adjacent computer room Provide data, phone, and power for 1 teacher's desk			
Furniture Provided by School District:		Provide 15 tables, 30 chairs, 1 teacher's desk and chair			
Plumbing / Gas		-	-	-	-	-
		-	-	-	-	-
Mechanical		- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air	-	32 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	(non-ceiling plenum)				
Lighting	**Architectural 2x2 Recessed.**	**Occupancy Sensor Daylight Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average**
Electrical / Power	**N/A** -	**8** Min. Receptacles		**N/A** -	**3 Speakers** 1 TV
Aux. Systems / Communications – Security	**5** Min. Data Outlet	**1@2 data/WAP**	Wall mounted telephone	**-** PA SPKR. W/Vol Control -	**- TV Speakers** -
General Activity	Business education room				
Electrical / Power Notes	• Provide teacher station with AV controls. • Provide operable partition.				
Aux. Systems Communications – Security Notes	• Provide 1 wall mounted telephone at room entrance •				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide Wood Door with Steel Frame and vision panel. • Provide corner guards at all exterior corners of interior walls				

Functional Area	Functional Unit
10.00 – COMPUTER ROOMS	**10.06 – BUSINESS EDUCATION (Minimum 85m²)**

Overview: A learning space dedicated to teach business like courses, subjects and scenarios.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	T-Bar (1220mm x 610mm)			
Ceiling Height Minimum		3050mm			
Millwork		1xL-1a; 630mm in length.			
Equipment Provided By School District:					
Equipment Provided By Design Builder:		Provide 1 wall mounted t.v., 1 305mm deep counter below the t.v., 2 2445x1225 W.B., 1 top hung operable wall between adjacent computer room Provide data, phone, and power for 1 teacher's desk			
Furniture Provided by School District:		Provide 15 tables, 30 chairs, 1 teacher's desk and chair			
Plumbing / Gas		-	-	-	-	-
		-	-	-	-	-
Mechanical		- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air	-	32 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	(non-ceiling plenum)				
Lighting	**ArchiteRecessed.x2 Recessed** -	**Occupancy Sensor Daylight Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A** -	**8** Min. Receptacles		**N/A** -	**N/A**
Aux. Systems / Communications – Security	**5** Min. Data Outlet	**1@2 data/WAP**	Wall mounted telephone	**- PA SPKR. W/Vol Control**	**- TV Speaker**
General Activity	Business education room				
Electrical / Power Notes	• Provide teacher station with AV controls. • Provide operable partition.				
Aux. Systems Communications – Security Notes	• Provide 1 wall mounted telephone at room entrance •				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide Wood Door with Steel Frame and vision panel. • Provide corner guards at all exterior corners of interior walls				

11.00 Music Room - Choral

Functional Area	Functional Unit
11.00 – MUSIC ROOM - CHORAL	**11.01 – MUSIC / CHORAL (Minimum 221m²)**

Overview:

The Main Studio will have a flat floor with moveable flats to accommodate up to 30 students.
The Main Studio will have acoustic treatment applied to walls and ceiling.

Adjacencies:

The Main Studio will provide access to all other rooms within the department.

Finishes	Floor	Carpet Tile Forbo Flotex
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	Suspended Acoustic Panels
Ceiling Height Minimum		
Millwork		5xH-3 (each unit to be 1200mm wide).
Equipment Provided By School District:		
Equipment Provided By Design Builder:		
Furniture Provided by School District:		Provide chairs and music stands for 32 students

Plumbing / Gas	SK-10 - Refer to Plumbing Fixture Schedules	- -	- -	- -	- -
Mechanical	- Common fan coil with adjacent Practice 11.05 and Storage 11.04, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface	- -	32 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	- Wall mount CO2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)				
Lighting	Suspended direct/indirect pendant	Occupancy Sensor Wall Pods Dimming	Emergency lighting	50 fc -	-0.6 min/average -
Electrical / Power	N/A	8 Min. Receptacles	AV rack		4 Speakers -
Aux. Systems / Communications – Security	4 Min. Data Outlets	1@2 data/WAP	Wall mounted telephone	- PA SPKER c/w volume control -	- TV media box Audio rack with mixing board, amplifiers/tuners etc
General Activity	Main music room				
Electrical / Power Notes	• Provide power to AV rack and TV media box				
Aux. Systems Communications – Security Notes	• Wall mounted audio speakers and sub woofer • AV rack complete with mixing board, amplifiers, tuner, microphones etc				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide Curtainwall glazing with a door connecting to the amphitheatre seating area. • Provide wall mounted light for incoming phone calls • Provide acoustic caulk/detailing around all doors and windows into this space • Provide 2 Acoustical Wood Doors with Steel Frames. • Provide minimum 1 exterior Steel door with Steel frame. • thermally broken, double glazed tempered glass				

Functional Area	Functional Unit
11.00 – MUSIC ROOM - CHORAL	**11.02 – OFFICE (Minimum 11m²)**

Overview:
The Office will be acoustically insulated.

Adjacencies:
The Office will be provided with a Direct Visual Connection to the Main Studio.

Finishes	Floor	Carpet Tile Forbo Flotex				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide data, phone, and power for 1 teacher's desk				
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
		-	-	-	-	-
Mechanical		- Common fan coil with adjacent Office 11.03, Practice 11.06 and Practice 11.07 heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	-	2 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

Lighting	**2x4 Recessed luminaires**	**Occupancy Sensor Dimming** Wall Pods	**N/A**	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A**	**3** Min. Receptacles	**N/A** -	**N/A** -	
Aux. Systems / Communications – Security	**2** Min. Data Outlets	**0** Min. Tel. Outlets	**0** Min Cable Outlets	**- PA SPKR** -	**-** -
General Activity	Music room office				
Electrical / Power Notes	• Provide outlets for work station.				
Aux. Systems Communications – Security Notes	• Provide data outlets for work station.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

Functional Area	Functional Unit
11.00 – MUSIC ROOM - CHORAL	**11.03 – OFFICE (Minimum 11m²)**

Overview:
The Office will be acoustically insulated.

Adjacencies:
The Office will be provided with a Direct Visual Connection to the Main Studio.

Finishes	Floor	Carpet Tile Forbo Flotex				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide data, phone, and power for 1 teacher's desk				
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common fan coil with adjacent Office 11.02, Practice 11.06 and Practice 11.07 heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	-	2 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

Lighting	**2x4 Recessed luminaires**	**Occupancy Sensor** Daylight Sensor Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A**	**3** Min. Receptacles	**N/A** -	**N/A** -	-
Aux. Systems / Communications – Security	**2** Min. Data Outlets			**- PA SPKR c/w volume control** -	- -
General Activity	Music room office				
Electrical / Power Notes	• Provide outlets for work station				
Aux. Systems Communications – Security Notes	• Provide outlets for work station				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

Functional Area	Functional Unit
11.00 – MUSIC ROOM - CHORAL	**11.04 – STORAGE (Minimum 18m²)**

Overview:

The Storage room will be provided with full height partitions.
The Storage room will be shared with the Drama Room but is not required to be accessed from the Drama Room directly

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common fan coil with adjacent Music/Choral 11.01 and Practice 11.06 heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air	- -	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	(non-ceiling plenum)				
Lighting	**Lensed LED Strip light**	**Occupancy Sensor** Wall Pods	**N/A**	**30 fc** -	**-** -
Electrical / Power	**N/A**	**2** Min. Receptacles	**N/A** -	**N/A** -	-
Aux. Systems / Communications – Security				**- PA SPKR** -	**-** -
General Activity	Music room instrument storage				
Electrical / Power Notes	• Provide general use receptacles				
Aux. Systems Communications – Security Notes	• PA speaker				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

Functional Area	Functional Unit
11.00 – MUSIC ROOM - CHORAL	**11.05 – PRACTICE (Minimum 13m²)**

Overview:
Practice Rooms 1, 2, 3 will provide acoustically separated practice spaces for individual students and groups of students.

Adjacencies:
The Practice Rooms will be provided with a Direct Visual Connection to the Main Studio.

Finishes	Floor	Carpet Tile Forbo Flotex				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		- -	- -	- -	- -	- -
Mechanical		- Common fan coil with adjacent Music/Choral 11.01 and Practice 11.06 heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization	- -	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	- Acoustically lined ducted transfer air (non-ceiling plenum)				
Lighting	**2x2 Recessed luminaires**	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A**	**3** Min. Receptacles	**N/A** -	**N/A** -	-
Aux. Systems / Communications – Security				**-** PA SPKR -	**-** -
General Activity	Practice music room				
Electrical / Power Notes	• Provide general use receptacles				
Aux. Systems Communications – Security Notes	• PA speaker				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

Functional Area	Functional Unit
11.00 – MUSIC ROOM - CHORAL	**11.06 – PRACTICE (Minimum 13m²)**

Overview:
Practice Rooms 1, 2, 3 will provide acoustically separated practice spaces for individual students and groups of students.

Adjacencies:
The Practice Rooms will be provided with a Direct Visual Connection to the Main Studio.

Finishes	**Floor**	Carpet Tile Forbo Flotex				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
		-	-	-	-	-
Mechanical		- Common fan coil with adjacent Music/Choral 11.01, Office 11.02 and Practice 11.07 heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room	-	n/a Occupant Load	2 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	temperature sensor with user interface **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**					
Lighting	**2x2 Recessed luminaires**	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average** -	
Electrical / Power	**N/A**	**3** Min. Receptacles	**N/A** -	**N/A** -	-	
Aux. Systems / Communications – Security				**- PA SPKR** -	**-** -	
General Activity	Practice music room					
Electrical / Power Notes	• Provide general use receptacles					
Aux. Systems Communications – Security Notes	• PA speaker					
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.					

Functional Area	Functional Unit
11.00 – MUSIC ROOM - CHORAL	**11.07 – PRACTICE (Minimum 14m²)**

Overview:
Practice Rooms 1, 2, 3 will provide acoustically separated practice spaces for individual students and groups of students.

Adjacencies:
The Practice Rooms will be provided with a Direct Visual Connection to the Main Studio.

Finishes	Floor	Carpet Tile Forbo Flotex				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		- -	- -	- -	- -	- -
Mechanical		- Common fan coil with adjacent Music/Choral 11.01, Office 11.02 and Practice 11.07 heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization	- -	n/a Occupant Load	2 Occupant Load	No Special Exhaust

	- Acoustically lined ducted transfer air (non-ceiling plenum)				
Lighting	**2x2 Recessed luminaires**	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A**	**3** Min. Receptacles	**N/A** -	**N/A** -	-
Aux. Systems / Communications – Security				**- PA SPKR** -	**-** -
General Activity	Practice music room				
Electrical / Power Notes	• Provide general use receptacles				
Aux. Systems Communications – Security Notes	• PA speaker				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

12.00 Drama Room

Functional Area	Functional Unit
12.00 – Drama Room	**12.01 – DRAMA / THEATRE (Minimum 200m²)**

Overview:

The Drama Room will allow students to develop stagecraft and acting skills while exploring communication-competencies
The Drama Room will function as a flat-floor black box theatre capable of accommodating moveable seating in various configurations.
The Drama Room will be square or rectilinear, with dimensions of the space to accommodate a minimum of 128 seats and a minimum 6.0m X 6.0m stage area in both a directional and theatre-in-the-round configuration.
Theatre lighting will be provided on motorized lowerable booms (gantry) for lighting adjustment at floor level. Four lighting booms (gantry) will be aligned with each wall of the Drama Room
The Drama Room will provide total blackout capability with all interior finishes painted black.
The Drama Room will have a motorized curtains separating the space to create side and back stages / wings.
The rear wall of the Drama Room will have a motorized cyclorama curtain to act as a projection screen
The Drama Room will include ante spaces as a backstage, as well as access to the Costume / Make-up / Props room and Sound / Lighting Room.
The Drama Room will include space for a control station to be coordinated with the school district.
A minimum capacity of 128 seats shall be provided. Provide theatre style seats for the full capacity.

Adjacencies:

The Drama Room will be positioned adjacent the Multi-Purpose Space.
The Drama Room will have direct access from School's main circulation through the backstage.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	Exposed Floor Above With Cable Grid
Ceiling Height Minimum		
Millwork		
Equipment Provided By School District:		

Equipment Provided By Design Builder:	**Provide ceiling cable grid for lighting and audio access, 16 seat wide (128 total seats) retractable seating unit with access stairs on both sides (no second floor access), Provide motorized curtains for stage separation** **A Projector and screen to be provided.** **Power, data and phone to be provided throughout.**				
Furniture Provided by School District:					
Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	**- Common Drama/Theatre 12.01 and 12.05, roof mounted air handling unit, heating/cooling, MERV 13 filtration** **- Supply from interstitial ceiling between Drama/Theatre 12.01 and Lighting and Sound 12.05, low level return, 1.62 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount, vandal proof, temperature sensor (Non-adjustable)** **- Return air CO2 sensor for demand control ventilation** **- Positive pressurization**	-	**128** Occupant Load	**- 50% outdoor air/supply air ratio, dedicated energy recovery ventilation** **- Outdoor air supply efficiency under winter design condition with frost control of 67%**	**- Light hazard occupancy fire protection**
Lighting	**- Provide general area house lighting** **Provide low level step lighting on stairs** **Provide lighting in catwalk area** **Provide theatrical lighting mounted on motorized lighting booms** -	**Wall Pods** **Scenes** Dimming	**Emergency Lighting** Exits lights	**-30 fc** -	**-0.6 min/average** -
Electrical / Power	**Panel (in adjacent space)** -	**9** Min. Receptacles	-	**N/A** -	-
Aux. Systems / Communications – Security	**1** Min. Data Outlets	**1@2 data/WAP**	Wall mounted telephone	**- PA SPKER c/w volume control and shutoff**	**- AV Speakers and subwoofer**

General Activity	Theatre room				
Electrical / Power Notes	• Provide power to lighting booms, projector, motorized screen etc				
Aux. Systems Communications – Security Notes	• Provide AV speakers and connections to AV rack at control station				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide 2 Wood Doors with Steel Frames. • Provide Wood Door with Steel Frame.				

Functional Area	Functional Unit
12.00 – Drama Room	12.02 – GREEN ROOM (Minimum 28m²)

Overview: A dedicated room provided in the back of the theatre to allow students and staff to collaborate prior and or during a drama performance.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	T-Bar (1220mm x 610mm)			
Ceiling Height Minimum		3050mm			
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:					
Furniture Provided by School District:					
Plumbing / Gas		-	-	-	-	-
		-	-	-	-	-
Mechanical		- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1.25 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	-	2 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		2x2 recessed luminaires	Occupancy sensor Wall Pods Dimming	Emergency lighting	50 fc -	-0.6 min/average -
Electrical / Power		Panel 1AV	10 Min. Receptacles with circuits designed to	N/A -	N/A -	-

		accommodate simultaneous usage on all outlets of hair dryers and curling irons. 6 Min. hardwired rough-ins for makeup lighting			
Aux. Systems / Communications – Security	**0**	1@2 data/WAP	**Wall mounted telephone**	- -	- -
General Activity	Green room for theatre support				
Electrical / Power Notes	• Provide general use receptacles				
Aux. Systems Communications – Security Notes	• Provide master PA volume control switch with complete shutoff for adjacent drama spaces				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame.				

Functional Area	Functional Unit
12.00 – Drama Room	**12.03 – THEATRE STORAGE (Minimum 37m²)**

Overview: A dedicated storage room for drama performance props, costumes, backdrops, etc.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Paint Sealer			
	Base	Epoxy Cove Base			
	Walls	Painted Gypsum Board			
	Ceiling	Exposed Structure Above			
Ceiling Height Minimum		Exposed Structure Above			
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:		Provide minimum 3000x3000mm overhead roll up door through exterior wall for loading access Provide overheight double doors opposite overhead roll up door for loading to the Drama room			
Furniture Provided by School District:					
Plumbing / Gas		-	-	-	-	-
		-	-	-	-	-
Mechanical		- Heavy duty, hydronic, fan assisted heater - 150 w/m2 - Wall mount, vandal proof, temperature sensor (Non-adjustable)	- -	n/a Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		LED Strip Lights	Occupancy Sensor Wall Pods	Emergency lighting	30 fc -	- -
Electrical / Power		N/A	2 Min. Receptacles	Powered O/H loading door -	N/A -	N/A-
Aux. Systems / Communications – Security		0 Min. Data Outlets	N/A	N/A	- PA SPKR -	- -
General Activity		Theatre storage				
Electrical / Power Notes		• Powered loading bay door.				
Aux. Systems Communications – Security Notes						
Special Requirements		• Acoustic separations between adjacent rooms				

	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame. • Provide Wood Doors with Steel Frames and vision panels.Provide 1 exterior quality weatherproofed overhead roll up door to exterior (3000x3000mm)

Functional Area	Functional Unit
12.00 – Drama Room	**12.04 – THEATRE STORAGE (Minimum 30m²)**

Overview: A dedicated storage room for drama performance props, costumes, backdrops, etc.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Paint Sealer			
	Base	Epoxy Cove Base			
	Walls	Painted Gypsum Board			
	Ceiling	Exposed Structure Above			
Ceiling Height Minimum		Exposed Structure Above			
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:					
Furniture Provided by School District:					
Plumbing / Gas		-	-	-	-
Mechanical		-	-	n/a Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		LED Strip Lights	Occupancy Sensor Wall Pods	Emergency lighting	30 fc -	- -
Electrical / Power		N/A	4 Min. Receptacles	N/A	N/A	N/A
Aux. Systems / Communications – Security		0 Min. Data Outlets	N/A	N/A	- N/A -	- N/A -
General Activity		Theatre storage				
Electrical / Power Notes		•				
Aux. Systems Communications – Security Notes		•				
Special Requirements		• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors and vestibule into this space				

	• Provide 2 Wood Doors with Steel Frames providing access through the storage room to the stage

Functional Area	Functional Unit
12.00 – Drama Room	**12.05 – LIGHTING AND SOUND (Minimum 205m²)**

Overview: A open walkable area above the drama room seating. High tension cable netting to be provided that will allow any user to walk over and set up lighting and rigging for drama performances. This room will include a vestibule for acoustic separation from the corridor.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Carpet Tile With Cable Grid				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide all lighting and sound. Power, data, phone and computer				
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common Drama/Theatre 12.01 and 12.05, roof mounted air handling unit, heating/cooling, MERV 13 filtration - High level supply , high level return, 0.65 cfm/ft2, air outlets <20 NC - Wall mount, vandal proof, temperature sensor (Non-adjustable) - Return air CO2 sensor for demand control ventilation - Positive pressurization	- Exposed ductwork	n/a Occupant Load	- 50% outdoor air/supply air ratio, dedicated energy recovery ventilation - Outdoor air supply efficiency under winter design condition with frost control of 67%	- Light hazard occupancy fire protection
Lighting		4' Surface	Wall Pods Dimming	N/A	50 fc -	-0.5 min/average -

Electrical / Power	**N/A** -	**7** Min. Receptacles	**Powered and motorized AV equipment**	**N/A** -	**N/A** -
Aux. Systems / Communications – Security	**5** Min. Data Outlets	1@2 data/WAP	**N/A**	**-** PA SPKR W/Vol. Control and complete shut off	**- AV equipment as per SD23 requirements**
General Activity	Theatre lighting and sound cable grid level				
Electrical / Power Notes	• Provide power for theatre AV equipment as required by SD23. • Provide DMX Control board and AV rack for theatrical lighting and sound controls.				
Aux. Systems Communications – Security Notes	• Provide power and data as required to all theatrical equipment.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space. • All Doors into space are to be acoustic doors.				

Functional Area	Functional Unit
12.00 – Drama Room	**12.05a – STORAGE (Minimum 64m²)**

Overview:

Costume / Make-up / Props will be a room for storage of materials and costumes, and preparation for student performances.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Paint Sealer				
	Base	Epoxy Cove Base				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Heavy duty, hydronic, fan assisted heater - 74 w/m2 - Wall mount, vandal proof, temperature sensor (Non-adjustable)	-	n/a Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		- LED Strip lights	- Occupancy sensor Wall pod	Emergency Light	-30 fc	-
Electrical / Power		N/A	2 Min. Receptacles	- N/A	- N/A	- N/A
Aux. Systems / Communications – Security		- N/A	- N/A	- N/A	- N/A	- N/A
General Activity		Theatre storage				
Electrical / Power Notes		•				
Aux. Systems Communications – Security Notes		•				
Special Requirements		• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls				

	• Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Doors with Steel Frames.

15.00 Visual Arts

Functional Area	Functional Unit
15.00 – VISUAL ARTS	**15.01 – ART (Minimum 128m²)**

Overview:

Provide two visual arts studios for drawing, painting, clay, photography, sculpture, carving and printmaking activities with a shared centralized storage and support area
Storage and support spaces will be centralized between Studio 1 and Studio 2.
Studio 1 and Studio 2 will be open learning environments made up of a number of unique areas.
Studio 1 and Studio 2 will be generalized mixed-medium art studios for up to 30 students.
Provide an open-backed display case for presentation of works into the main corridor of the School. The display case will have glass on the corridor side, and be no less than 2400w x 1524h x 610d. The display case will include adjustable glass shelving.

Adjacencies:

Studio 1 will be directly adjacent to Studio 2.
Provide a Direct Visual Connection to the School circulation routes for viewing purposes.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		2xH-7 (2500mm in length for each unit), 12xL-1a, 5xU-1, 2xU-4; kitchenette to be 7500mm in length, Additional millwork to 2400mm in length.
Equipment Provided By School District:		
Equipment Provided By Design Builder:		Provide 1 305mm counter under t.v., 2 freestanding laundry sinks, 3 single sinks, Provide 4 pottery stations, 1 wall mounted t.v. Provide data, phone, and power for 1 teacher's desk
Furniture Provided by School District:		8 tables, 32 chairs

Plumbing / Gas	SK-1 @ 3 - Refer to Plumbing Fixture Schedules	SK-2 @ 2 - Refer to Plumbing Fixture Schedules	FD-1 @ 2 - Refer to Plumbing Fixture Schedules	SI-1 - Refer to Plumbing Fixture Schedules	- Floor drains to connect to SI-1
Mechanical	- Common fan coil with adjacent Art Storage 15.04, heating/cooling,	- -	32 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	MERV 13 filtration **- High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**				
Lighting	**2x2 Recessed luminaires**	**Occupancy Sensor** Wall Pods Dimming	Emergency lighting	**75 fc**	**-0.6 min/average**
Electrical / Power	**N/A** -	**11** Min. Receptacles	**N/A** -	**4 Pottery Stations**	
Aux. Systems / Communications – Security	**3** Min. Data Outlet	**1@2 data/WAP**	Wall mounted telephone	**- PA SPKRS c/w volume control**	**- TV complete with ceiling mounted audio speakers**
General Activity	Art room				
Electrical / Power Notes	• Provide power above all millwork counters • Provide power for potter wheels • Provide power for TV and speakers				
Aux. Systems Communications – Security Notes	• Provide 1 wall mounted telephone at room entrance • Provide data for TV (media box) •				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. • Provide Exterior Quality Operable Glazed Wall. • Provide Steel door with Steel frame. •				

Functional Area	Functional Unit
15.00 – VISUAL ARTS	**15.02 – ART (Minimum 124m²)**

Overview:

Provide two visual arts studios for drawing, painting, clay, photography, sculpture, carving and printmaking activities with a shared centralized storage and support area
Storage and support spaces will be centralized between Studio 1 and Studio 2.
Studio 1 and Studio 2 will be open learning environments made up of a number of unique areas.
Studio 1 and Studio 2 will be generalized mixed-medium art studios for up to 30 students.
Provide an open-backed display case for presentation of works into the main corridor of the School. The display case will have glass on the corridor side, and be no less than 2400w x 1524h x 610d. The display case will include adjustable glass shelving.

Adjacencies:

Studio 1 will be directly adjacent to Studio 2.
Provide a Direct Visual Connection to the School circulation routes for viewing purposes.

Finishes	Floor	Resilient Flooring			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	T-Bar (1220mm x 610mm)			
Ceiling Height Minimum		3050mm			
Millwork		2xH-7 (2500mm in length for each unit). 16xL-1a, 8xU-1, 4xU-4 (2 separate kitchenette units to be 7500mm and 3900mm in length).			
Equipment Provided By School District:					
Equipment Provided By Design Builder:		Provide 1 wall mounted t.v., 1 305mm counter under t.v., 1 freestanding laundry sink, 5 single sinks Provide 4 pottery stations, Provide data, phone, and power for 1 teacher's desk.			
Furniture Provided by School District:		8 tables, 32 chairs			
Plumbing / Gas		SK-1 @ 5 - Refer to Plumbing Fixture Schedules	SK-2 - Refer to Plumbing Fixture Schedules	- -	- -	- -
Mechanical		- Common fan coil with adjacent Green Room 15.03,	-	32 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	heating/cooling, MERV 13 filtration **- High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**				
Lighting	**2x2 Recessed luminaires**	**Occupancy Sensor** Wall Pods Dimming	Emergency lighting	**75 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A** -	**14** Min. Receptacles	**N/A** -	**4 Pottery Stations** -	
Aux. Systems / Communications – Security	**3** Min. Data Outlet	**1@2 data/WAP**	**Wall mounted telephone**	**- PA SPKR c/w volume control**	**- TV complete with ceiling mounted audio speakers**
General Activity	Art room				
Electrical / Power Notes	• Provide power above all millwork counters • Provide power for potter wheels • Provide power for TV and speakers				
Aux. Systems Communications – Security Notes	• Provide 1 wall mounted telephone at room entrance • Provide data for TV (media box) •				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. •				

Functional Area	Functional Unit
15.00 – VISUAL ARTS	**15.03 – GREENSCREEN ROOM (Minimum 25m²)**

Overview: A dedicated room provided for video production with a chroma key greenscreen.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork		2xH-7, 16xL-1a, 8xU-1, 4xU-4				
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide ceiling hung pipe grid				
Furniture Provided by School District:						
Plumbing / Gas		- -	- -	- -	- -	- -
Mechanical		- Common fan coil with adjacent Art Room 15.02, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- Exposed ductwork	n/a Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		Architectural 2x2 recessed.	Occupancy Sensor Wall Pods	N/A	30fc -	- -

		Dimming			
Electrical / Power	**N/A** -	**4** Min. Receptacles	**N/A** -	**N/A** -	**N/A** -
Aux. Systems / Communications – Security	**0** Min. Data Outlets	N/A	N/A	**-** N/A -	**-** N/A -
General Activity	Greenscreen room				
Electrical / Power Notes	•				
Aux. Systems Communications – Security Notes	•				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Glazed Aluminum Sliding Partition. • Provide ceiling mounted pipe grid				

Functional Area	Functional Unit
15.00 – VISUAL ARTS	**15.04 – ART STORAGE (Minimum 24m²)**

Overview:

Material Storage will include perimeter millwork for the purposes of art supply storage.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common fan coil with adjacent Art Room 15.01, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- Exposed ductwork	n/a Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		Architectural 2x2 recessed.	Occupancy Sensor Wall Pods	N/A	30 fc -	- -
Electrical / Power		N/A -	4 Min. Receptacles	N/A -	N/A -	N/A -

Aux. Systems / Communications – Security	0 Min. Data Outlets	N/A	N/A	- N/A -	- N/A -
General Activity	Art storage room				
Electrical / Power Notes	•				
Aux. Systems Communications – Security Notes	•				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame.				

Functional Area	Functional Unit
15.00 – VISUAL ARTS	**15.05 – KILN (Minimum 15m²)**

Overview: A chain link enclosure to house a full commercial size Kiln equipment machine and required accessories.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Architectural Concrete			
	Base	N/A			
	Walls	Exterior Walls			
	Ceiling	Exposed Structure Above			
Ceiling Height Minimum		Exposed Structure Above			
Millwork					
Equipment Provided By School District:		Kiln			
Equipment Provided By Design Builder:		Provide adequate ventilation and heat protection for the kiln. Provide lockable exterior gate with fence			
Furniture Provided by School District:					
Plumbing / Gas		-	-	-	-
Mechanical		- Negative pressurization	-	n/a Occupant Load	- Slotted local capture exhaust, 10 m/s slot velocity - Exhaust to discharge at roof level	- Ordinary hazard (Group 1) occupancy fire protection - Dry, 286 °F sprinkler heads
Lighting		- Vapour tight fixtures	- Occupancy Sensor -	- N/A -	-50 fc -	-0.3 min/average -
Electrical / Power		-	-1 GFCI weatherproof receptacle, 20A	- N/A	- Kiln -	- N/A -
Aux. Systems / Communications – Security		- N/A	- N/A	- N/A	- N/A	- N/A
General Activity		Exterior kiln area				
Electrical / Power Notes		• Provide power to Kiln and accessories.				
Aux. Systems Communications – Security Notes		•				
Special Requirements		• Provide chain link enclosure with lockable gate				

16.00 Home Economics (Textiles / Food)

Functional Area	Functional Unit
16.00 – HOME ECONOMICS (TEXTILES / FOOD)	**16.01 – TEXTILES (Minimum 128m²)**

Overview: The Textiles area will be shared with the Home EC room. Students will learn sew by hand and with machine.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xL-1a, 1xH-3, 1xU-4, 20xU-1, Teacher desk with 5xL-3a, 26xL-34; Total length of millwork to be a minimum of 27m in length.
Equipment Provided By School District:		
Equipment Provided By Design Builder:		Provide 1 305mm counter under t.v. Provide 32 sewing machines, 1 stackable washer and dryer, 1 wall mounted t.v. Provide data, phone, and power for 1 teacher's desk?
Furniture Provided by School District:		2 tables, 4 ironing boards, 6 work tables

Plumbing / Gas	SK-1 - Refer to Plumbing Fixture Schedules	LB-1 - Refer to Plumbing Fixture Schedules	- -	- -	- -
Mechanical	- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1.26 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation	- -	32 Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection

	- Positive pressurization **- Acoustically lined ducted transfer air (non-ceiling plenum)**				
Lighting	**Architectural 2x2 recessed.** Under-cabinet lighting.	**Occupancy Sensor** Wall Pods Dimming	Emergency Lighting	**50 fc**	**-0.6 min/average**
Electrical / Power	**Panel**	**40** Min. Receptacles	**N/A**	**Stackable washer and dryer** **32 Sewing Machines**	**N/A**
Aux. Systems / Communications – Security	**2** Min. Data Outlet	**1@2 data/WAP**	**Wall mount telephone**	**- PA SPKR. W/Vol. Control** -	**- TV** Speakers -
General Activity	Textiles room				
Electrical / Power Notes	• Provide power for all textiles equipment. • Local electrical panel.				
Aux. Systems Communications – Security Notes	• Provide 1 wall mounted telephone at room entrance. • Provide data for teacher station. • Provide ceiling mounted document camera at teacher/demonstration table.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. •				

Functional Area	Functional Unit
16.00 – HOME ECONOMICS (TEXTILES / FOOD)	**16.02 – CHANGE ROOM (Minimum 4m²)**

Overview: An enclosed private space for staff and teacher to use as a change room.

Adjacencies: Located within the Textiles room.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	Gypsum Board Drop Ceiling - Painted				
Ceiling Height Minimum		2450mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide 1 rod and curtain (900x2200 opening)				
Furniture Provided by School District:						
Plumbing / Gas		- -	- -	- -	- -	- -
Mechanical		-	- -	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		Down lights Wall sconce (if mirror provided)	Occupancy Sensor Wall Pods	N/A	50 fc -	- -
Electrical / Power		N/A	0 Min. Receptacles	N/A -	N/A -	N/A
Aux. Systems / Communications – Security		0 Min. Data Outlets	0 Min. Tel. Outlets	0 Min Cable Outlets	- N/A -	- N/A -
General Activity		Textiles change room				
Electrical / Power Notes		•				
Aux. Systems Communications – Security Notes		•				
Special Requirements		• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space				

Functional Area	Functional Unit
16.00 – HOME ECONOMICS (TEXTILES / FOOD)	**16.03 – CANTEEN (Minimum 19m²)**

Overview:

The Catering Centre / Servery Counter will be a non-commercial kitchen space for serving meals and for supporting special events.
The Catering Centre / Servery Counter will have a sales counter for small goods for students.

Adjacencies:

The Catering Centre / Servery Counter will be directly adjacent and accessible from the to the Assembly / Lounge / Dining Area.
The Catering Centre / Servery Counter will be separated from the Assembly / Lounge / Dinging area by a securable opening.

Finishes	Floor	Epoxy Paint Sealer				
	Base	Epoxy Cove Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide 1 vertical roll shutter Provide 2 fridge / freezer units Provide for Menu electronic (TV) signage display, locate 4-plex power outlet, 2 data ports, and backing for this signage display overhead for view by customers using the canteen.				
Furniture Provided by School District:		2 shelving units				
Plumbing / Gas		- -	- -	- -	- -	- -
Mechanical		-	- -	n/a Occupant Load	No Special Exhaust	- -
Lighting		2x2 Recessed luminaires Serving counter downlights	Occupancy Sensor Wall Pods	N/A	50fc -	-0.4 min/average -
Electrical / Power		N/A -	5 Min. Receptacles	N/A	2 Refrigerators -	-
Aux. Systems / Communications – Security		2 Min. Data Outlets			- PA SPKR -	- -

General Activity	Canteen
Electrical / Power Notes	• Provide outlets for refrigerators and freezers • Provide connection to roll shutter
Aux. Systems Communications – Security Notes	• PA speaker
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. • Provide 1 vertical roll shutter on the counter. (900mm sill, 2300mm head height)

Functional Area	Functional Unit
16.00 – HOME ECONOMICS (TEXTILES / FOOD)	**16.04 – HOME EC. (Minimum 125m²)**

Overview:

The two Foods rooms will be identical in function.
Each Lab will accommodate 28 students
Each Lab will provide six non-commercial student kitchens
One student kitchen will include fully accessible counters, appliances, sinks and millwork.
Each kitchen station will accommodate four students
Student kitchen workstations will be oriented around the perimeter of the room.
The kitchen table area will be in the centre of the room, with direct sightlines to the Demo Kitchen.
An alcove or niche will be created for a full sized upright refrigerator.
The Demo Kitchen will be a space for instruction by a teacher, with viewing angles for all students and an over-counter mirror and a large monitor connected to camera support over the cooking surfaces.
A kitchen island as work table will be provided opposite the refrigerator.
The Teacher area will be a space within the Foods Lab for teacher preparation.
The Teacher area will include millwork for storage and appliances.

Adjacencies:

Each Foods room will be accessed directly from the School's main circulation.
Each kitchen will have cabinetry and counter work space and space for a table and chairs for four students.
The Teacher area will be directly behind the Demo Kitchen, within the Foods room.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1 Teaching station (4xL-1a, 1xL-10); teacher demo table to be a minimum of 3600mm in length. 1xHC-8, 2xHC-5, 3xHC-3, 24xL-1a, 7xU-1, 5xU-5, 6xU-3 (each student kitchenette to be 4500mm in length)
Equipment Provided By School District:		
Equipment Provided By Design Builder:		Provide 7 double sinks, 1 teaching station (with 1 dishwasher, 1 double sink, 1 cooktop), Provide 1 wall

	mounted t.v., 1 305mm counter under t.v., 1 2445x1225 W.B., 1 sliding door between Home Ec rooms Provide 1 refrigerator, 2 wall ovens in HC-5 millwork, 7 round tables, 28 chairs, 4 work tables, 8 microwaves, 1 cooktop, 5 ranges • **Provide data, phone, and power for 1 teacher's desk**				
Furniture Provided by School District:					
Plumbing / Gas	**SK-5** **- Refer to Plumbing Fixture Schedules**	- -	- -	- -	- -
Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.22 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**	- -	**32** Occupant Load	**- Common kitchen exhaust system for 7 range hoods** **- Internal range hood fans removed** **- Common roof mounted fan controlled by local switch**	**- Light hazard occupancy fire protection**
Lighting	**2x2 recessed luminaires**	**Occupancy Sensor** Wall Pods Dimming	**Emergency Lighting**	**75 fc**	**-0.6 min/average** -
Electrical / Power	**N/A** -	**43** Min. Receptacles	**5 Ranges** **2 Cook tops** **2 wall ovens**	**8 Microwaves** **1 Dishwasher** **1 Refrigerator** -	**3 Speakers** -
Aux. Systems / Communications – Security	**3** Min. Data Outlet	1@2 data/WAP	**Wall mounted telephone**	**- PA SPKR** -	**- Wall mounted TV complete with wall mounted speakers**
General Activity	Home ec. rooms				
Electrical / Power Notes	• Provide connection to all kitchen appliances				
Aux. Systems Communications – Security Notes	• Provide TV and AV speakers • Provide ceiling mounted document camera at demonstration station				
Special Requirements	• Acoustic separations between adjacent rooms				

	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
16.00 – HOME ECONOMICS (TEXTILES / FOOD)	**16.05 – HOME EC. (Minimum 125m²)**

Overview:

The two Foods rooms will be identical in function.
Each Lab will accommodate 28 students
Each Lab will provide seven non-commercial student kitchens
One student kitchen will include fully accessible counters, appliances, sinks and millwork.
Each kitchen station will accommodate four students
Student kitchen workstations will be oriented around the perimeter of the room.
The kitchen table area will be in the centre of the room, with direct sightlines to the Demo Kitchen.
An alcove or niche will be created for a full sized upright refrigerator.
The Demo Kitchen will be a space for instruction by a teacher, with viewing angles for all students and an over-counter mirror and a large monitor connected to camera support over the cooking surfaces
A kitchen island as work table will be provided opposite the refrigerator.
The Teacher area will be a space within the Foods Lab for teacher preparation.
The Teacher area will include millwork for storage and appliances.

Adjacencies:

Each Foods room will be accessed directly from the School's main circulation.
Each kitchen will have cabinetry and counter work space and space for a table and chairs for four students.
The Teacher area will be directly behind the Demo Kitchen, within the Foods room.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1 Teaching station (4xL-1a, 1xL-10); teacher demo table to be a minimum of 3600mm in length. 1xHC-8, 2xHC-5, 3xHC-3, 24xL-1a, 7xU-1, 5xU-5, 6xU-3 (each student kitchenette to be 4500mm in length)
Equipment Provided By School District:		, 7 round tables, 28 chairs, 4 work tables,
Equipment Provided By Design Builder:		Provide 7 double sinks, 1 teaching station (with 1 dishwasher, 1 double sink, 1 cooktop), Provide 1 wall

	mounted t.v., 1 305mm counter under t.v., 1 2445x1225 W.B., 1 sliding door between Home Ec rooms **Provide 1 refrigerator, 2 wall ovens in HC-5 millwork, 8 microwaves, 1 cooktop, 5 ranges** • **Provide data, phone, and power for 1 teacher's desk**				
Furniture Provided by School District:					
Plumbing / Gas	**SK-5** **- Refer to Plumbing Fixture Schedules**	**-** -	**-** -	**-** -	**-** -
Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.22 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**	**-** -	**32** Occupant Load	**- Common kitchen exhaust system for 7 range hoods** **- Internal range hood fans removed** **- Common roof mounted fan controlled by local switch**	**- Light hazard occupancy fire protection**
Lighting	**2x2 recessed luminaires**	**Occupancy Sensor** Wall Pods Dimming	**Emergency Lighting**	**75 fc**	**-0.6 min/average** -
Electrical / Power	**N/A** -	**42** Min. Receptacles	**5 Ranges** **2 cooktops** **2 wall ovens**	**8 Microwaves** **1 Dishwasher** **1 Refrigerator** -	-
Aux. Systems / Communications – Security	**3** Min. Data Outlet	**1@2 data/WAP**	**Wall mounted telephone**	**- PA SPKR** -	**- Wall mounted TV complete with wall mounted speakers** -
General Activity	Home ec. rooms				
Electrical / Power Notes	• Provide connections to kitchen appliances				
Aux. Systems Communications – Security Notes	• Provide TV and AV speakers • Provide ceiling mounted document camera at demonstration station				
Special Requirements	• Acoustic separations between adjacent rooms				

	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
16.00 – HOME ECONOMICS (TEXTILES / FOOD)	**16.06 – HOME EC. STORAGE (Minimum 38m²)**

Overview:

The Dry Foods Storage will be a pantry shared by and accessed from both Foods rooms. This room may be combined with Equipment Storage provided the areas are designated separately and combine to the total aggregate areas for each space.
Provide pantry cupboards with adjustable shelves for storage for dishes, appliances, bake ware etc
The Dry Foods Storage will be a separated room, without venting / ducting to remain rodent-proof.
This space will be a separate room within the Foods Shared Support Space with millwork and shelving for storage of kitchen equipment and small appliances.
The Equipment Storage will be a room shared by and accessed from both Foods rooms
This room will be a separate room within the Foods Shared Support Space with multiple refrigerators and freezers.
The Cold Storage will be a room shared by and accessed from both Foods rooms
This space will be a separate room within the Foods Shared Support Space with laundry facilities for use by Staff.
This space will be provided with laundry appliances.
The Laundry will be a room shared by and accessed from both Foods rooms.

Adjacencies: Refer to the adjacency diagram.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		2xL-1a, 1xU-1, 1xU-4; 1650mm in total length.
Equipment Provided By School District:		
Equipment Provided By Design Builder:		Provide 1 stackable washer and dryer, 2 fridge/freezer units, 1 vertical freezer
Furniture Provided by School District:		8 shallow shelves, 3 deep shelves

Plumbing / Gas	SK-S - Refer to Plumbing Fixture Schedules	LB-1 - Refer to Plumbing Fixture Schedules	- -	- -	- -

Mechanical	**- 3 ACH General Exhaust controlled by local switch**	**-** -	**n/a** Occupant Load	**-**	**-** -
Lighting	**Architectural 2x2 recessed.**	**Occupancy Sensor** Wall Pods	Emergency lighting	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A** -	**8** Min. Receptacles	**N/A**	**2 Refrigerators** 1 Vertical Freezer 1 Stackable Washer/Dryer	**N/A** -
Aux. Systems / Communications – Security	**0** Min. Data Outlet	**0** Min. Tel. Outlet	**0** Min. Cable Outlet	**- PA SPKR. W/Vol. Control** -	**- N/A** -
General Activity	Home ec. storage				
Electrical / Power Notes	• Provide power to all storage room equipment.				
Aux. Systems Communications – Security Notes	•				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide at least 1 fully accessible door into this space • Provide Wood Door with Steel Frame and vision panel. • Provide Wood Door with Steel Frame and vision panel.				

17.00 Automotive / Mechanics

Functional Area	Functional Unit
17.00 – AUTOMOTIVE / MECHANICS	**17.01 – MECHANICS SHOP (Minimum 224m²)**

Overview:

The goal for the Automotive / Mechanics shop will inspire students and provide opportunities for hands-on learning.
The Automotive / Mechanics shop will be designed for 30 students.
Hard-wired carbon monoxide sensors will be provided throughout the space.
The Shop Area will be used to provide perimeter work benches and storage for the overall department.
The Shop Area will be open to the Shop Area – Bays / Hoists and Shop Area – Equipment.
The Shop Area - Bays / Hoists will provide a flat floored area for automobile maintenance and car hoists.
Provide a minimum of 2 motorized overhead vehicle access doors to each of the required bays.
Provide open floor space for two vehicles within the Mechanics Shop.
The Shop Area – Equipment space will be an open area to the Bays / Hoists
The Shop Area – Equipment space will be used for storing tools and a tire changing machine with appropriate clearances.
Provide blocking or backing in all walls above counter tops for installation of tool boards from counter to +1830mm.

Adjacencies:

The Automotive / Mechanics Shop will be in the same area of the School as the TED Space, Woodworking and Metal Shop.

Finishes	Floor	Epoxy Paint Sealer
	Base	Epoxy Cove Base
	Walls	Painted Gypsum Board
	Ceiling	Exposed Structure Above
Ceiling Height Minimum		Exposed Structure Above
Millwork		

Equipment Provided By School District:	**Provide 1 computer station with monitor,**				
Equipment Provided By Design Builder:	**Refer to Appendix 1F for equipment details.**				
Furniture Provided by School District:					
Plumbing / Gas	**SK-7** **- Refer to Plumbing Fixture Schedules**	**EW-1** **- Refer to Plumbing Fixture Schedules**	**FD-1** **- Refer to Plumbing Fixture Schedules**	**HR-3 @ 2** **- Refer to Extraction Arms and Hose Reel Schedules**	**TD-1 @ 2** **- Refer to Plumbing Fixture Schedules**
Mechanical	**- Dedicated, roof mounted air handling unit, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount, vandal proof, temperature sensor (Non-adjustable)** **-Negative pressurization** - Passive outdoor air supply from roof mounted gravity ventilation hood, motorized damper interlocked with vehicle exhaust - Hydronic unit heater at outdoor air supply	**- Exposed ductwork** - Carbon Monoxide and Nitrogen Dioxide wall mounted gas monitor with audible and visual alarm connected to DDC	**32** Occupant Load	**- 100% outdoor air, dedicated energy recovery ventilation** **- Outdoor air supply efficiency under winter design condition with frost control of 67%** **- Provide 4 ACH general exhaust direct to outdoors with minimum 3 m clearance to intakes and building openings** - 4 @ HR-1, 4 @ HR-2 vehicle exhaust retractable hose reels with tail pipe attachment and roof mounted exhaust fans, refer to Extraction Arms and Hose Reel Schedules	**- Ordinary hazard (Group 2) occupancy fire protection**
Lighting	**- Low glare highbay luminaires** -	**Occupancy Sensor** Wall Pods Dimming	**Emergency Lighting**	**100fc** -	**-0.6 min/average** -
Electrical / Power	**Panel** -	**16** Min. Receptacles	**Shop equipment** Compressor	**N/A** -	-
Aux. Systems / Communications – Security	**3** Min. Data Outlet	**1@2 data/WAP**	Wall mounted telephone	**-** PA SPKRS c/w volume control -	**-** -
General Activity	Mechanic's shop				
Electrical / Power Notes	• Provide lighting and power for the mezzanine storage area				

	• Provide connection to all equipment such as hoists, tools, compressor etc.
Aux. Systems Communications – Security Notes	• PA speakers
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide a minimum of 2 overhead glass doors into MECHANICS SHOP 17.01 from EXTERIOR SHOP COMPOUND 17.03 (3600x3600mm) • Provide a minimum of 1 overhead glass door into the METAL SHOP 20.01 from the MECHANICS SHOP 17.01. (3600x3600mm) • Provide Steel Doors with Steel Frames. • Provide Steel Door with Steel Frame. • Provide 1 shop sink with soap dispenser, paper towel, and degrease • Provide 1 eye wash station • Provide 1 set of speakers with soundbar for the T.V. • Provide 2 white boards • Provide 6 tool boards • Provide multi tiered storage and shelving

Functional Area	Functional Unit
17.00 – AUTOMOTIVE / MECHANICS	**17.02 – STORAGE (Minimum 72m²)**

Overview:

The ground level Storage Area must be capable of holding 20,000lbs of steel in 4m lengths. A level concrete pad of 6m x 2m will be provided and demarcated. Storage will be vertical, against a wall, divided into 40 equal spacings
Provide space to cut and divide metal materials.
The Storage Area will be able to be secured, with stored materials unable to be taken or fall when stored.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Paint Sealer				
	Base	Epoxy Cove Base				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		**Refer to Appendix 1F for equipment details.**				
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common to Metal Shop 20.01, Office 20.02 and Storage 17.02, roof mounted air handling unit, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount, vandal proof, temperature sensor (Non-adjustable) - Negative pressurization	-	n/a Occupant Load	No Special Exhaust	- Ordinary hazard (Group 2) occupancy fire protection

Lighting	**Lensed LED Strip light**	**Occupancy Sensor** Wall Pods	Emergency Lighting	**100 fc** -	**-0.6 min/average**
Electrical / Power	**N/A**	**8** Min. Receptacles	**N/A** -	**N/A** -	**N/A** -
Aux. Systems / Communications – Security	**0** Min. Data Outlets	**N/A**	**N/A**	**- PA SPKR. W/Vol. Control** -	**- N/A** -
General Activity	Mechanic's shop storage				
Electrical / Power Notes	• Provide power to shop equipment if required.				
Aux. Systems Communications – Security Notes	•				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Steel Doors with Steel Frames. • •				

Functional Area	Functional Unit
17.00 – AUTOMOTIVE / MECHANICS	**17.03 – EXTERIOR SHOP COMPOUND (Minimum 104m²)**

Overview:

Secure Storage will be a secured storage room with controlled access to tools and automotive parts.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Asphalt				
	Base	n/a				
	Walls	Exterior walls				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide chain link enclosure with gates				
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		no Air Conditioning	-	n/a Occupant Load	No Special Exhaust	- Dry, Ordinary hazard (Group 2) occupancy fire protection
Lighting		- Canopy high-bay luminaires	- Occupancy sensor	N/A	-50 fc	-
Electrical / Power		-	-4 Min. Receptacles	N/A	- N/A	- N/A
Aux. Systems / Communications – Security		- N/A	- N/A	- N/A	- N/A	- N/A
General Activity		Mechanic's shop exterior compound				
Electrical / Power Notes		• Provide weatherproof receptacles.				
Aux. Systems Communications – Security Notes		• Provide coverage with security cameras.				
Special Requirements		• Provide chain link enclosure with lockable gates				

Functional Area	Functional Unit
17.00 – AUTOMOTIVE / MECHANICS	**17.04 – COMPRESSOR (Minimum 17m²)**

Overview:
The Storage room will contain a compressor to run a pneumatic tool system.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Paint Sealer				
	Base	Epoxy Cove Base				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide compressor unit as per school district requirements, 7.hp S-001707 DV Systems,				
Furniture Provided by School District:						
Plumbing / Gas		FD-1 - Refer to Plumbing Fixture Schedules	HD-1 - Refer to Plumbing Fixture Schedules	- -	- -	- -
Mechanical		- Heavy duty, hydronic, fan assisted heater - 250 w/m2 - Wall mount, vandal proof, temperature sensor (Non-adjustable)	- -	n/a Occupant Load	No Special Exhaust	- Dry, Ordinary hazard (Group 2) occupancy fire protection
Lighting		Lensed Led Striplight	Wall switch	N/A	50 fc -	- -
Electrical / Power		N/A	1 Min. Receptacles	N/A -	N/A -	-
Aux. Systems / Communications – Security		0 Min. Data Outlets			- -	- -
General Activity		Mechanic's shop compressor				
Electrical / Power Notes		• Provide power to compressor				
Aux. Systems Communications – Security Notes		•				
Special Requirements		• Acoustic separations between adjacent rooms				

	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide 1 Steel Door with Steel Frame. •

Functional Area	Functional Unit
17.00 – AUTOMOTIVE / MECHANICS	**17.05 – MECHANICS MEZZANINE (Minimum 55m²)**

Overview: A Mezzanine space within the Mechanical room.

Adjacencies: Refer to adjacency diagram.

Finishes	**Floor**	**Epoxy Paint Sealer**				
	Base	**Epoxy Cove Base**				
	Walls	**Painted Gypsum Board**				
	Ceiling	**Exposed Structure Above**				
Ceiling Height Minimum		**Exposed Structure Above**				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		**Provide 1070mm high painted steel vertical picket guardrails as required** **Provide rough-in for TV Monitor and mount for students see the time and block rotation.**				
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		-	-	n/a Occupant Load	No Special Exhaust	- Ordinary hazard (Group 2) occupancy fire protection
Lighting		- Strip lights -	- Occupancy sensor Wall pod -	Emergency Lighting	-50 fc -	-0.4 min/average -
Electrical / Power		- -	2 Min. Receptacles	-	- -	- -
Aux. Systems / Communications – Security		- -	- -	- -	- -	- -
General Activity		Mechanic's shop mezzanine				
Electrical / Power Notes		• Provide general lighting and receptacles for storage space				
Aux. Systems Communications – Security Notes		•				
Special Requirements		• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls				

	• Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space

18.00 TED Space – Robotics / Electronics and Design Hub

Functional Area	Functional Unit
18.00 – TED SPACE – ROBOTICS / ELECTRONICS AND DESIGN HUB	**18.01 – MAKER / ROBOTICS (Minimum 122m²)**
Overview: The TED Space – Robotics / Electronics and Design Hub is intended to inspire innovation and exploration related to activities in the trades and technology. The TED Space will be in the same area of the School as the Automotive / Mechanics, Woodworking and Metals shops. The shop areas will be visible to students in main corridor through large glazed areas. The space will be an open central area, to accommodate moveable furniture and free floor space. The Shop Area – Robotics / Electronics space will be used for teaching advanced electronics, as well as electrical wiring, including mock house wiring. Work benches will be fixed in position in rows, with power and data provided via overhead cord reels.	
Adjacencies: Refer to adjacency diagram.	
Finishes – Floor	Resilient Flooring
Base	Rubber Base
Walls	Painted Gypsum Board
Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum	3650mm; If a layout beneficial to the School District's use of the space requires stacking space at floor level above these rooms, the ceiling height of 18.01 Maker / Robotics may be reduced to 3050mm.
Millwork	
Equipment Provided By School District:	
Equipment Provided By Design Builder:	Provide glazing between Maker / Robotics 18.01 and Drafting / Animation 18.02.

	Refer to Appendix 1F for equipment list & details.				
Furniture Provided by School District:					
Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.25 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**	- -	**32** Occupant Load	**No.** Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting	**Architectural 2x2 Recessed.**	**Occupancy Sensor** Wall Pods	**Emergency Lighting**	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**- Panel** -	**30** Min. Receptacles	**- Maker space equipment**	**- N/A**	**- N/A**
Aux. Systems / Communications – Security	Min. Data Outlet	Min. Tel. Outlet	Wall mounted telephone	**- PA SPKR. W/Vol. Controls**	**- TV** Speakers
General Activity	Maker and Robotics room				
Electrical / Power Notes	• Providing alternate feature lighting to support final design of space is encouraged. • Provide display case lighting if required. • Provide power to specialized equipment as required by SD23.				
Aux. Systems Communications – Security Notes	• Provide 1 wall mounted telephone at room entrance				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates				

	• Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. • Provide Wood Door with Steel Frame and vision panel. • Provide Aluminum Door with Aluminum Frame and vision panels. •

Functional Area		Functional Unit				
18.00 – TED SPACE – ROBOTICS / ELECTRONICS AND DESIGN HUB		**18.02 – DRAFTING / ANIMATION (Minimum 122m²)**				
Overview: Drafting / Animation is intended to inspire innovation and exploration related to activities in the trades and technology.						
Adjacencies: Refer to adjacency diagram.						
Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3650mm; If a layout beneficial to the School District's use of the space requires stacking space at floor level above these rooms, the ceiling height of 18.02 Drafting Animation may be reduced to 3050mm.				
Millwork						
Equipment Provided By School District:		Provide computer stations as per school district requirements				
Equipment Provided By Design Builder:		Provide glazing between Maker / Robotics 18.01 and Drafting / Animation 18.02 **Refer to Appendix 1F for equipment list for details.**				
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1.25 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface	-	32 Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection

	- Wall mount CO2 sensor for demand control ventilation **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**				
Lighting	**- low glare indirect luminaires**	**Occupancy Sensor** Wall Pods Dimming		**50 fc** -	**-0.6 min/average** -
Electrical / Power	- -	**65** Min. Receptacles	-	- -	-
Aux. Systems / Communications – Security	**34** Min. Data Outlet	1@2 data/WAP	Wall mounted telephone	**- PA SPKRS** -	- **TV and AV speakers**
General Activity	Drafting and animation room				
Electrical / Power Notes	• Provide outlets for 30 workstations (quadplex per station)				
Aux. Systems Communications – Security Notes	• Provide wall mounted telephone at room entrance • Provide data outlets for 30 work stations • Pac poles are not acceptable				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

19.00 Woodworking Shop

Functional Area	Functional Unit
19.00 – WOODWORKING SHOP	**19.01 – WOOD CONSTRUCTION SHOP (Minimum 246m²)**

Overview:

The Woodworking Shop will inspire students and provide opportunities for hands on learning.
The Woodworking Shop will be in the same area of the School as the Automotive / Mechanics and Metals Shops.
The Woodworking Shop will be designed for 30 students
The Woodworking Shop area will be visible to students in main corridor through large glazed areas. This visibility may be provided through other appropriate teaching spaces if direct corridor access is not provided.
Provide space for work benches.
Provide a fixed-location power quad outlet on upright post at each bench.
Floor finish: The Shop Area - Work Table area will have a 19mm T&G plywood finish floor on 19mm plywood on a gasketed wood frame sleepers on the concrete slab.
The Shop Area – Work Tables room will be free of structural columns.
The Shop Area – Work Tables room will be provided with natural daylight through glazing above 4m from the floor. Glazing will be north facing and/or shielded to protect from direct exposure to reduce glare and unwanted solar gains.
The Shop Area – Work Table room will be provided with high-level motorized louvers or motorized operable windows to allow for passive ventilation.
The Shop Area – Work Table room perimeter requires millwork counters and tool boards.
Provide blocking or backing in all walls above counter tops for installation of tool boards from counter to +1830mm.
The Shop Area – Work Tables will include a wash up area including two hand washing sinks and an eyewash station.
The Construction / Fabrication Space will be an open floor area for construction of trade mock-up structures.
The Construction / Fabrication Space will have an indoor lumber storage area of 3600W x 915D.
The Construction / Fabrication Space will be free of structural columns.

Adjacencies:

Provide a single 2400w x 3040h overhead garage door connecting the space to the TED Compound for material deliveries and movement of mock-ups between the shop and the compound.
The Shop Area - Equipment space will be open to the main shop space.
The Shop Area - Equipment space will be open to the main shop space.

The Shop Area – Equipment space will be free of structural columns.					
Finishes **Floor** **Base** **Walls** **Ceiling**	**Epoxy Paint Sealer** **Epoxy Cove Base** **Painted Gypsum Board** **Exposed Structure Above**				
Ceiling Height Minimum	**Exposed Structure Above**				
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:	**Provide backing, power, and data connections for TV Monitor and mount for students see the time and block rotation.** **Provide 1 overhead door to exterior shop compound.** **Refer to Appendix 1F for equipment details.**				
Furniture Provided by School District:					
Plumbing / Gas	**SK-7** **- Refer to Plumbing Fixture Schedules**	**EW-1** **- Refer to Plumbing Fixture Schedules**	**FD-1** **- Refer to Plumbing Fixture Schedules**	- 6 @ Compressed Air drops for quick connect	**TD-1 @ 2** **- Refer to Plumbing Fixture Schedules**
Mechanical	**- Common to Wood Construction Shop 19.01, Tools 19.02 and 19.04 Office, roof mounted air handling unit, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount, vandal proof, temperature sensor (Non-adjustable)** **- Negative pressurization** - Passive outdoor air supply from roof mounted gravity ventilation hood, motorized damper interlocked with finishing room exhaust - Hydronic unit heater at outdoor air supply	**- Exposed ductwork**	**32** Occupant Load	**- 90% outdoor air, dedicated energy recovery ventilation** **- Outdoor air supply efficiency under winter design condition with frost control of 67%** **- Provide 4 ACH general exhaust direct to outdoors with minimum 3 m clearance to intakes and building openings** - Vertical cartridge style sawdust collector system with recirculating, filtered make-up air, automatic filter cleaning, floor mounted drum collector, rated for 3380 l/s 3.5 kPa, discharge silencer to reduce fan noise to 85dBA at 1.52 m, stainless steel explosion vent	**- Ordinary hazard (Group 2) occupancy fire protection**

Lighting	**- Low glare highbay luminaires**	**Occupancy Sensor** Wall Pods	**Emergency Lighting**	**-100 fc** -	**-0.6 min/average** -
Electrical / Power	**Panel 1C** -	**21** Min. Receptacles	Provide Required Power For All Shop Equipment	- -	- -
Aux. Systems / Communications – Security	**9** Min. Data Outlet	**1@2 data/WAP**	**Wall mounted telephone**	**- PA SPKR**	- -
General Activity	Wood construction shop room				
Electrical / Power Notes	• Provide electrical panel complete with emergency push button/contactor shutoff for all shop equipment. • Interlock all dust producing equipment such that power is not provided to the equipment unless the dust collector is operational. • Provide bonding to all dust collection duct work as required. • Provide connection to all shop equipment with disconnects where required. Power connections shall not be hazards in the form of tripping or other obstruction to the operation of the equipment or movement of students. • Provide general use receptacles around the perimeter of the room and allow min 12 cord reels for work stations				
Aux. Systems Communications – Security Notes	• PA speaker				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Steel Door with Steel Frame. • Provide Steel Door with Steel Frame. • Provide a minimum of 1 overhead glass doors into WOOD CONSTRUCTION SHOP 19.00 from EXTERIOR SHOP COMPOUND 19.05 (3600x3600mm) • Provide 1 TV; LG 55UP7000 • Provide 1 set of external speakers or soundbar • Provide 2 white boards • Provide 1 Plywood / sheet stock storage • Provide 1 lumber rack (longs) • Provide 1 lumber rack / shelves (for shorts)				

	• Provide multi tiered storage

Functional Area	Functional Unit
19.00 – WOODWORKING SHOP	**19.02 – TOOLS (Minimum 21m²)**

Overview: A dedicated lockable Tool storage room to be provided within the Wood Construction Shop.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Paint Sealer
	Base	Epoxy Cove Base
	Walls	Painted Gypsum Board With Plywood Sheathing On Interior
	Ceiling	Exposed Structure Above
Ceiling Height Minimum		Exposed Structure Above
Millwork		
Equipment Provided By School District:		
Equipment Provided By Design Builder:		Provide plywood lining on interior walls of this room for tool storage. **Refer to Appendix 1F for equipment list and details.**
Furniture Provided by School District:		

Plumbing / Gas	-	-	-	-	-
Mechanical	- Common to Wood Construction Shop 19.01, Tools 19.02 and 19.04 Office, roof mounted air handling unit, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount, vandal proof, temperature sensor (Non-adjustable) - Negative pressurization - Transfer air through wall or door grille (non-ceiling plenum)	- Exposed ductwork	n/a Occupant Load	- Provide 5 ACH general exhaust	- Ordinary hazard (Group 2) occupancy fire protection

Lighting	**Lensed Led Striplights**	**Occupancy Sensor** Wall Pods	Emergency lighting	**75 fc** -	-
Electrical / Power	**N/A**	**4** Min. Receptacles	Provide Required Power For All Shop Equipment -	**N/A** -	**N/A** -
Aux. Systems / Communications – Security	**0** Min. Data Outlets			**-** -	**-** -
General Activity	Wood construction shop tool storage room				
Electrical / Power Notes	• Provide general use receptacles – coordinate heights with millwork where applicable				
Aux. Systems Communications – Security Notes					
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. Storage Location required for tools listed below: • Provide 1 blade sharpening system • Provide hammers • Provide dado set • Provide turning tools for lathes, expanding chucks • Provide handsaws • Provide hand planers, typical and specialty • Provide belt sanders • Provide 1 palm sander • Provide cordless hand drills • Provide chisels and gouges • Provide 1 circular saw • Provide files • Provide squares • Provide levels • Provide wood mallets • Provide 1 wrench set • Provide crescent wrenches • Provide hex set				

	• Provide router bits • Provide clamps, all sizes • Provide pocket hole jig • Provide hand routers • Provide cordless impact drivers, drills • Provide drill bit sets, counter sinks, hole set, • Provide forstner bits • Provide carving tool kits • Provide dowling jigs • Provide feather boards • Provide feather boards • Provide 1 burnisher • Provide flush cut saws • Provide 1 dovetail saw • Provide block planer • Provide Dremel tool kit • Provide scrapers • Provide jig saws • Provide brad nailers • Provide biscuit jointers • Provide tape measures

Functional Area	Functional Unit
19.00 – WOODWORKING SHOP	**19.03 – FINISHING (Minimum 18m²)**

Overview:

The Finishing Room will be a separate room accessed from the Shop Area for the purposes of painting and spray finishing projects.
The room should be considered a paint spraying booth with suitable fixtures and ventilation throughout, and a dedicated countertop space with direct ventilation for heavier use.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	Exposed Structure Above			
Ceiling Height Minimum		Exposed Structure Above			
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:		**Refer to Appendix 1F for equipment list and details.**			
Furniture Provided by School District:					
Plumbing / Gas		-	-	-	-
		-	-	-	-
Mechanical		- Negative pressurization - Wall transfer air (non-ceiling plenum)	-	n/a Occupant Load	- Explosion proof exhaust fan on roof - Slotted local capture exhaust in Finish Room, 10 m/s slot velocity - Local control
Lighting		Lensed Led hazardous location rated luminaires	Wall Pods mounted outside room	Emergency Lighting	75 fc -
Electrical / Power		N/A	2 Min. hazardous location rated receptacles	N/A	Connect exhaust fan
Aux. Systems / Communications – Security		0 Min. Data Outlets			-
General Activity		Wood construction shop finishing room			

Electrical / Power Notes	• All installations within this room shall be classified for the hazardous rating of the space • Light and fan control shall be outside of the room adjacent to the door
Aux. Systems Communications – Security Notes	• N/A
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. • Provide 1 spray booth counter with dedicated venting at the counter top suitable for coating objects up to the size of small furniture. • Provide 1 work bench • Provide 1 flammable storage cabinet

Functional Area	Functional Unit
19.00 – WOODWORKING SHOP	**19.04 – OFFICE (Minimum 13m²)**

Overview:

The Office will be a private office for the shop instructor, with space for one workstation and shelving on one side.

Adjacencies:

The Office will be a secured area with a Direct Visual Connection to the Shop areas.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:		Provide 1 computer station, 1 phone				
Equipment Provided By Design Builder:		**Refer to Appendix 1F for equipment list and details.**				
Furniture Provided by School District:		Teacher desk with chair				
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common to Wood Construction Shop 19.01, Tools 19.02 and 19.04 Office, roof mounted air handling unit, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount, vandal proof, temperature sensor (Non-adjustable) - Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- Exposed ductwork	2 Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection

Lighting	**2x2 Recessed luminaires**	**Occupancy Sensor** Daylight Sensor Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A**	**4** Min. Receptacles	**N/A** -	**N/A** -	-
Aux. Systems / Communications – Security	**2** Min. Data Outlets			**- PA SPKR c/w volume control**	**-** -
General Activity	Wood construction shop office room				
Electrical / Power Notes	• Provide outlets for work station				
Aux. Systems Communications – Security Notes	• Provide outlets for work station				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. •				

Functional Area	Functional Unit
19.00 – WOODWORKING SHOP	**19.05 – EXTERIOR SHOP COMPOUND (Minimum 109m²)**

Overview:

The Material Storage room will provide an area for wood storage and general construction materials open to the main shop space.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Asphalt				
	Base	N/A				
	Walls	Exterior Walls and chain link enclosure				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide chain link enclosure with gate				
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		no Air Conditioning	-	n/a Occupant Load	No Special Exhaust	- Dry, Ordinary hazard (Group 2) occupancy fire protection
Lighting		- Canopy highbay luminaires	Photocell Wall pod		-50 fc	-
Electrical / Power		-	-4 Min. receptacles	-	-	-
Aux. Systems / Communications – Security		-	-	-	- Cameras	-
General Activity		Exterior shop compound				
Electrical / Power Notes		• Provide weatherproof receptacles				
Aux. Systems Communications – Security Notes		• Provide security cameras for complete coverage				
Special Requirements		• Provide chain link enclosure with lockable gates				

Functional Area	Functional Unit
19.00 – WOODWORKING SHOP	**19.06 – DUST COLLECTOR (Minimum 29m²)**

Overview: A dedicated lockable Dust Collector room with adequate dust extraction equipment. Equipment to extract dust from adjacent Wood Construction Shop. Room to have exterior access for weekly/monthly disposal of collected dust / wood chips.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Paint Sealer			
	Base	Epoxy Cove Base			
	Walls	Painted Gypsum Board			
	Ceiling	Exposed Structure Above			
Ceiling Height Minimum		Exposed Structure Above			
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:					
Furniture Provided by School District:					
Plumbing / Gas		-	-	-	-	-
		-	-	-	-	-
Mechanical		no Air Conditioning	- Exposed ductwork	n/a Occupant Load	- Vertical cartridge style sawdust collector system with recirculating, filtered make-up air, automatic filter cleaning, floor mounted drum collector, rated for 3380 l/s 3.5 kPa, discharge silencer to reduce fan noise to 85dBA at 1.52 m, stainless steel explosion vent	- Dry, Ordinary hazard (Group 2) occupancy fire protection
Lighting		Sealed lensed Led striplights	Occupancy Sensor Wall Pods	N/A	50 fc -	- -
Electrical / Power		N/A	0 Min. Receptacles	N/A -	Dust collector	N/A -
Aux. Systems / Communications – Security		0 Min. Data Outlets			- -	- -
General Activity		Wood construction shop dust collector				

Electrical / Power Notes	• Provide connection(s) to dust collector including control panel etc.
Aux. Systems Communications – Security Notes	•
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Steel Door with Steel Frame. •

Functional Area	Functional Unit
19.00 – WOODWORKING SHOP	**19.07 – WOOD MEZZANINE (Minimum 55m²)**

Overview: A mezzanine located with the Wood Construction Shop. Area to be accessed by stairs. Mezzanine to be used for storing materials, equipment, etc.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Paint Sealer
	Base	Epoxy Cove Base
	Walls	Painted Gypsum Board
	Ceiling	Exposed Structure Above
Ceiling Height Minimum		Exposed Structure Above
Millwork		
Equipment Provided By School District:		
Equipment Provided By Design Builder:		Provide 1070mm high painted steel vertical picket guardrails as required Provide rough-in for TV Monitor and mount for students see the time and block rotation.
Furniture Provided by School District:		

Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	-	- -	n/a Occupant Load	No Special Exhaust	- Ordinary hazard (Group 2) occupancy fire protection
Lighting	- LED striplights -	- - Occupancy sensor Wall pod	Emergency Lighting	-50 fc -	- -
Electrical / Power	- -	3 Min. Receptacles	- -	- -	- -
Aux. Systems / Communications – Security	1 Min. Data Outlets -	- -	- -	- -	- -

General Activity	Mechanic's shop mezzanine
Electrical / Power Notes	•
Aux. Systems Communications – Security Notes	•
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls

	• Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space

20.00 Metals Shop

Functional Area	Functional Unit
20.00 – METALS SHOP	**20.01 – METAL SHOP (Minimum 155m²)**
Overview: The Metals Shop will inspire students and provide opportunities for hands on learning. The space will support welding, foundry activities and machining. Shops will be designed for 30 students. Shop area will be visible to students in main corridor through large glazed areas. The Shop Area - Equipment space will be an open area for floor standing shop equipment and mobile workbenches. Provide floor space with appropriate clearance and safety zones for all equipment. Provide ceiling-hung power for the centre of the room, and fixed power at perimeter spaces. Provide space for mobile work benches Provide a fixed-location power quad outlet on upright post at each bench. The Shop Area - Work Table room will be free of structural columns. The Shop Area - Work Table room perimeter requires millwork counters and tool boards.	
Adjacencies: Refer to adjacency diagram.	
Finishes – Floor	Epoxy Paint Sealer
Base	Epoxy Cove Base
Walls	Painted Gypsum Board
Ceiling	Exposed Structure Above
Ceiling Height Minimum	Exposed Structure Above
Millwork	
Equipment Provided By School District:	Provide 1 computer station, 1 desk, 1 phone, 1 file cabinet, 1 lockable upper and lower shelving unit
Equipment Provided By Design Builder:	Provide 1 overhead door to mechanics shop Provide 1 overhead door from Metal Shop to exterior shop compound.**Refer to Appendix 1F for equipment list and details.**
Furniture	

Provided by School District:					
Plumbing / Gas	**SK-7** **- Refer to Plumbing Fixture Schedules**	**EW-1** **- Refer to Plumbing Fixture Schedules**	**FD-1** **- Refer to Plumbing Fixture Schedules**	**TD-1** **- Refer to Plumbing Fixture Schedules**	**-** -
Mechanical	**- Common to Metal Shop 20.01, Office 20.02 and Storage 17.02, roof mounted air handling unit, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount, vandal proof, temperature sensor (Non-adjustable)** **- Negative pressurization** - Passive outdoor air supply from roof mounted gravity ventilation hood, motorized damper interlocked with welding and forge canopy hood exhaust - Hydronic unit heater at outdoor air supply	**-** -	**32** Occupant Load	**- 100% outdoor air, dedicated energy recovery ventilation** **- Outdoor air supply efficiency under winter design condition with frost control of 67%** **- Provide 4 ACH general exhaust direct to outdoors with minimum 3 m clearance to intakes and building openings** - Roof mounted welding exhaust fan, rated for 2560 l/s 750 Pa, vertical discharge velocity stack, local control - Roof mounted forge canopy hood exhaust fan, rated for 2570 l/s 750 Pa, vertical discharge velocity stack, local control	**- Ordinary hazard (Group 2) occupancy fire protection**
Lighting	**- Low glare higbay luminaires** -	**2 Occupancy Sensors** Wall Pods	**Emergency Lighting**	**-75 fc** -	**-0.6 min/average** -
Electrical / Power	**Panel 3C** -	**24** Min. Receptacles	**-** -	**- Shop equipment** -	**3 Speakers** -
Aux. Systems / Communications – Security	**2** Min. Data Outlet	W@2 data/WAP	Wall mounted telephone	**- PA SPKR/Strobe**	**- TV media box and speakers**
General Activity	Metal shop room				
Electrical / Power Notes	• Provide receptacles around the perimeter and allow for min 6 cord reels • Provide connection to all metal shop equipment				
Aux. Systems Communications – Security Notes	• Provide 1 wall mounted telephone at room entrance • Provide wall mounted TV and AV speakers				
Special Requirements	• Acoustic separations between adjacent rooms				

	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. • Provide corner guards at all exterior corners of interior walls • Provide 1 Shop wash sink, soap dispenser, paper towel dispenser, degreaser • Provide 1 t.v. LG 55UP7000 • Provide 1 set of external speakers or soundbar • Provide 2 white boards • Provide large fume hood for foundry • Provide multi tiered storage, longstock storage •

Functional Area	Functional Unit
20.00 – METALS SHOP	**20.02 - OFFICE (Minimum 13m²)**

Overview:

The Office will be a private office for the shop instructor, with space for one workstation and shelving on one side.
The Office will be shared between both 17.01 Mechanics Shop and the 20.01 Metal Shop. Direct access will be provided from both spaces.

Adjacencies:

The Office will be a secured area with a Direct Visual Connection to the Shop areas.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:		Provide 1 computer station, 1 phone				
Equipment Provided By Design Builder:						
Furniture Provided by School District:		Teacher's desk with chair				
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common to Metal Shop 20.01, Office 20.02 and Storage 17.02, roof mounted air handling unit, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount, vandal proof, temperature sensor (Non-adjustable) - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- Exposed ductwork	2 Occupant Load	-	- Ordinary hazard (Group 1) occupancy fire protection

Lighting	**2x4 Recessed luminaires**	**Occupancy Sensor** Daylight Sensor Wall Pods Dimming	**N/A**	**50 fc**	**-0.6 min/average**
Electrical / Power	**N/A**	**2** Min. Receptacles	**N/A** -	**N/A** -	**1 Speaker** -
Aux. Systems / Communications – Security	**2** Min. Data Outlets			**- PA SPKR c/w volume control**	-
General Activity	Metal shop office room				
Electrical / Power Notes	• Provide outlets for work station				
Aux. Systems Communications – Security Notes	• Provide outlets for work station • PA speaker and volume control				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide 2 Wood Doors with Steel Frames and vision panels.				

21.00 Science Department

Functional Area		Functional Unit				
21.00 – SCIENCE DEPARTMENT		**21.01 - SCIENCE (Minimum 97m²)**				
Overview: Provide a science departmental cluster with a Super Lab and supporting Studios. Each Studio will contain a demonstration area. The Super Lab will be supported by a Prep / Storage room and a Chemical Storage shared space.						
Adjacencies: Refer to adjacency diagram.						
Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork		4xH-3 (1200mm in length for each unit), 11xL-1a, 8xU-1, 3xU-4 (counter to be 8800mm in length).				
Equipment Provided By School District:		Provide 1 computer station, 1 wall mounted t.v.				
Equipment Provided By Design Builder:		Provide 1 2-way fume hood, 2x 2445x1225 W.B., 1 305mm counter under t.v., 3 single sinks, 3 dual nozzle gas fixtures				
Furniture Provided by School District:		Provide 1 teacher desk with chair, 8 work tables, 38 chairs, 1 round table,				
Plumbing / Gas		SK-3 @ 3 - Refer to Plumbing Fixture Schedules	SK-6 - Refer to Plumbing Fixture Schedules	NG-2 @ 3 - Refer to Plumbing Fixture Schedules	- All drainage to be Acid Waste pipe and fittings - All drainage to connect to central below grade Acid Neutralizer	- -
Mechanical		- Dedicated, roof mounted air handling unit, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount, vandal proof, temperature sensor (Non-adjustable) - Negative pressurization	- -	32 Occupant Load	- 490 l/s to constant volume exhaust energy recovery system - Pass-through fume hood - Roof mounted, explosion proof, spark resistant, exhaust fan, rated for 370 l/s 375 Pa, vertical discharge velocity stack, local control on both sides of fume hood	- Ordinary hazard (Group 1) occupancy fire protection

Lighting	**2x2 recessed** luminaires	**Occupancy Sensor** Wall Pods Dimming	**Emergency Lighting**	**50fc** -	**-0.6 min/average**
Electrical / Power	**N/A**	**10** Min. Receptacles	**N/A**	**N/A**	
Aux. Systems / Communications – Security	**2** Min. Data Outlet	**1@2 data/WAP**	**Wall mounted telephone**	**-PA SPKR**	**TV and speakers**
General Activity	Science Lab				
Electrical / Power Notes	• Provide general use receptacles • Provide equipment specific connections				
Aux. Systems Communications – Security Notes	• Provide TV and AV speakers • PA speaker				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. • Provide corner guards at all exterior corners of interior walls • Provide 1 3-panel sliding glass door (2400x2200mm) between adjacent science rooms				

Functional Area	Functional Unit
21.00 – SCIENCE DEPARTMENT	**21.02 - SCIENCE (Minimum 97m²)**

Overview: Provide a science departmental cluster with a Super Lab and supporting Studios. Each Studio will contain a demonstration area. The Super Lab will be supported by a Prep / Storage room and a Chemical Storage shared space.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork		11xL-1a, 8xU-1, 3xU-4; counter to be 8800mm in total length.				
Equipment Provided By School District:		Provide 1 computer station, 1 wall mounted t.v.				
Equipment Provided By Design Builder:		Provide 1 2-way fume hood, 2x 2445x1225 W.B., 1 305mm counter under t.v., 3 single sinks, 3 dual nozzle gas fixtures				
Furniture Provided by School District:		Provide 1 teacher desk with chair, 10 work tables, 38 chairs, 1 round table,				
Plumbing / Gas		SK-3 @ 3 - Refer to Plumbing Fixture Schedules	-	NG-2 @ 3 - Refer to Plumbing Fixture Schedules	- All drainage to be Acid Waste pipe and fittings - All drainage to connect to central below grade Acid Neutralizer	- -
Mechanical		- Dedicated, roof mounted air handling unit, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount, vandal proof, temperature sensor (Non-adjustable) - Negative pressurization	- -	32 Occupant Load	- 490 l/s to constant volume exhaust energy recovery system	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		-2x2 Recessed luminaires	Occupancy Sensor Wall Pods Dimming	Emergency Lighting 1 Exits	50 fc -	-0.6 min/average -
Electrical / Power		N/A	10 Min. Receptacles	N/A -	N/A -	

Aux. Systems / Communications – Security	**2** Min. Data Outlet	**1@2 data/WAP**	**Wall mounted telephone**	**- PA SPKR** -	- TV and speakers -
General Activity	Science Lab				
Electrical / Power Notes	• Provide general use receptacles • Provide equipment specific connections				
Aux. Systems Communications – Security Notes	• Provide TV and AV speakers • PA speaker				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. • Provide corner guards at all exterior corners of interior walls • Provide 1 3-panel sliding glass door (2400x2200mm) between adjacent science rooms •				

Functional Area	Functional Unit
21.00 – SCIENCE DEPARTMENT	**21.03 – SCIENCE (Minimum 97m²)**

Overview: Provide a science departmental cluster with a Super Lab and supporting Studios. Each Studio will contain a demonstration area. The Super Lab will be supported by a Prep / Storage room and a Chemical Storage shared space.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork		11xL-1a, 8xU-1, 3xU-4; counter to be 8800mm in total length.				
Equipment Provided By School District:		Provide 1 computer station, 1 wall mounted t.v.				
Equipment Provided By Design Builder:		Provide 1 2-way fume hood, 2x 2445x1225 W.B., 1 305mm counter under t.v., 3 single sinks, 3 dual nozzle gas fixtures				
Furniture Provided by School District:		Provide 1 teacher desk with chair, 10 work tables, 38 chairs, 1 round table,				
Plumbing / Gas		SK-3 @ 3 - Refer to Plumbing Fixture Schedules	-	NG-2 @ 3 - Refer to Plumbing Fixture Schedules	- All drainage to be Acid Waste pipe and fittings - All drainage to connect to central below grade Acid Neutralizer	- -
Mechanical		- Dedicated, roof mounted air handling unit, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount, vandal proof, temperature sensor (Non-adjustable) - Negative pressurization	- -	32 Occupant Load	- 490 l/s to constant volume exhaust energy recovery system	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		-2x2 Recessed	Occupancy Sensor Wall Pods Dimming	Emergency Lighting 1 Exits	50 fc -	-0.6 min/average -
Electrical / Power		N/A	10 Min. Receptacles	N/A -	N/A -	

Aux. Systems / Communications – Security	**2** Min. Data Outlet	1@2 data/WAP	Wall mounted telephone	**- PA SPKR** -	- TV and speakers -
General Activity	Science Lab				
Electrical / Power Notes	• Provide general use receptacles • Provide equipment specific connections				
Aux. Systems Communications – Security Notes	• Provide TV and AV speakers • PA speaker				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. • Provide corner guards at all exterior corners of interior walls • Provide 1 3-panel sliding glass door (2400x2200mm) between adjacent science rooms •				

Functional Area	Functional Unit
21.00 – SCIENCE DEPARTMENT	**21.04 – SCIENCE (Minimum 97m²)**

Overview: Provide a science departmental cluster with a Super Lab and supporting Studios. Each Studio will contain a demonstration area. The Super Lab will be supported by a Prep / Storage room and a Chemical Storage shared space.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork		11xL-1a, 8xU-1, 3xU-4; counter to be 8800mm in total length.				
Equipment Provided By School District:		Provide 1 computer station,				
Equipment Provided By Design Builder:		Provide 1 2-way fume hood, 2x 2445x1225 W.B., 1 305mm counter under t.v., 3 single sinks, 3 dual nozzle gas fixtures, 1 wall mounted t.v.				
Furniture Provided by School District:		Provide 1 teacher desk with chair, 10 work tables, 38 chairs, 1 round table,				
Plumbing / Gas		SK-3 @ 3 - Refer to Plumbing Fixture Schedules	-	NG-2 @ 3 - Refer to Plumbing Fixture Schedules	- All drainage to be Acid Waste pipe and fittings - All drainage to connect to central below grade Acid Neutralizer	- -
Mechanical		- Dedicated, roof mounted air handling unit, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount, vandal proof, temperature sensor (Non-adjustable) - Negative pressurization	- -	32 Occupant Load	- 490 l/s to constant volume exhaust energy recovery system	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		-2x2 Recessed	Occupancy Sensor Wall Pods Dimming	Emergency Lighting 1 Exits	50 fc -	-0.6 min/average -

Electrical / Power	**N/A**	**10** Min. Receptacles	**N/A** -	**N/A** -	
Aux. Systems / Communications – Security	**2** Min. Data Outlet	**1@2 data/WAP**	**Wall mounted telephone**	**- PA SPKR**	**- TV and speakers**
General Activity	Science Lab				
Electrical / Power Notes	• Provide general use receptacles • Provide equipment specific connections				
Aux. Systems Communications – Security Notes	• Provide TV and AV speakers • PA speaker				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. • Provide corner guards at all exterior corners of interior walls • Provide 1 3-panel sliding glass door (2400x2200mm) between adjacent science rooms •				

Functional Area	Functional Unit
21.00 – SCIENCE DEPARTMENT	**21.05 – SCIENCE (Minimum 97m²)**

Overview: Provide a science departmental cluster with a Super Lab and supporting Studios. Each Studio will contain a demonstration area. The Super Lab will be supported by a Prep / Storage room and a Chemical Storage shared space.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork		11xL-1a, 8xU-1, 3xU-4; counter to be 8800mm in total length.				
Equipment Provided By School District:		Provide 1 computer station,				
Equipment Provided By Design Builder:		Provide 1 2-way fume hood, 2x 2445x1225 W.B., 1 305mm counter under t.v., 3 single sinks, 3 dual nozzle gas fixtures, 1 wall mounted t.v. eye wash station				
Furniture Provided by School District:		Provide 1 teacher desk with chair, 10 work tables, 38 chairs, 1 round table,				
Plumbing / Gas		SK-3 @ 3 - Refer to Plumbing Fixture Schedules	-	NG-2 @ 3 - Refer to Plumbing Fixture Schedules	- All drainage to be Acid Waste pipe and fittings - All drainage to connect to central below grade Acid Neutralizer	- -
Mechanical		- Dedicated, roof mounted air handling unit, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount, vandal proof, temperature sensor (Non-adjustable) - Negative pressurization	- -	32 Occupant Load	- 490 l/s to constant volume exhaust energy recovery system	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		2x2 Recessed	Occupancy Sensor Wall Pods Dimming	Emergency Lighting 1 Exits	50 fc -	-0.6 min/average -

Electrical / Power	**N/A**	**10** Min. Receptacles	**N/A** -	**N/A** -	
Aux. Systems / Communications – Security	**2** Min. Data Outlet	1@2 data/WAP	**Wall mounted telephone**	**- PA SPKR**	**- TV and speakers**
General Activity	Science Lab				
Electrical / Power Notes	• Provide general use receptacles • Provide equipment specific connections				
Aux. Systems Communications – Security Notes	• Provide TV and AV speakers • PA speaker				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. • Provide corner guards at all exterior corners of interior walls • Provide 1 3-panel sliding glass door (2400x2200mm) between adjacent science rooms •				

Functional Area	Functional Unit
21.00 – SCIENCE DEPARTMENT	**21.06 – SCIENCE (Minimum 97m²)**

Overview: Provide a science departmental cluster with a Super Lab and supporting Studios. Each Studio will contain a demonstration area. The Super Lab will be supported by a Prep / Storage room and a Chemical Storage shared space.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork		3xH-3 (each unit to be 1200mm), 11xL-1a, 8xU-1, 3xU-4; counter to be 8800mm in length.				
Equipment Provided By School District:		Provide 1 computer station,				
Equipment Provided By Design Builder:		Provide 1 2-way fume hood, 2x 2445x1225 W.B., 1 305mm counter under t.v., 3 single sinks, 3 dual nozzle gas fixtures, 1 wall mounted t.v.				
Furniture Provided by School District:		Provide 1 teacher desk with chair, 8 work tables, 38 chairs, 1 round table,				
Plumbing / Gas		SK-3 @ 3 - Refer to Plumbing Fixture Schedules	SK-6 - Refer to Plumbing Fixture Schedules	NG-2 @ 3 - Refer to Plumbing Fixture Schedules	- All drainage to be Acid Waste pipe and fittings - All drainage to connect to central below grade Acid Neutralizer	- -
Mechanical		- Dedicated, roof mounted air handling unit, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount, vandal proof, temperature sensor (Non-adjustable) - Negative pressurization	- -	32 Occupant Load	- 490 l/s to constant volume exhaust energy recovery system - Pass-through fume hood - Roof mounted, explosion proof, spark resistant, exhaust fan, rated for 370 l/s 375 Pa, vertical discharge velocity stack, local control on both sides of fume hood	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		Architectural luminaires	Occupancy Sensor Wall Pods	Emergency Lighting 1 Exits	50 fc -	-0.6 min/average -

		Dimming			
Electrical / Power	**N/A**	**10** Min. Receptacles	**N/A** - **Lab equipment**	**N/A** -	**3 Speakers** 1 TV
Aux. Systems / Communications – Security	**2** Min. Data Outlet	**1@2 data/WAP**	**Wall mounted telephone**	**- PA SPKR** -	**- TV and AV speakers**
General Activity	Science Lab				
Electrical / Power Notes	• Provide general use receptacles • Provide equipment specific connections				
Aux. Systems Communications – Security Notes	• Provide TV and AV speakers • PA speaker				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. • Provide corner guards at all exterior corners of interior walls • Provide 1 3-panel sliding glass door (2400x2200mm) between adjacent science rooms				

Functional Area	Functional Unit
21.00 – SCIENCE DEPARTMENT	**21.07 – SCIENCE LAB (Minimum 177m²)**

Overview:

Science Theory Studios will be open classroom spaces for teaching nonspecific science courses.
Each Science Theory Studio will have a teacher demonstration table on a 305mm high raised platform. An adjustable mirror will be provided over the demonstration table.
All Science Theory Studios will have direct access physical and a Direct Visual Connection to the Super Lab.
All Science Theory Studios will have access directly from the Super Lab - Physics / Chemistry / Biology.
All Science Theory Studios will be provided with perimeter lab storage and fixed lab benches
All Science Theory Studios will include a teacher demonstration table with sink and required power, water and gas to support teaching Physics, Chemistry or Biology.
The Super Lab will be an open space to support the three sciences of Physics, Chemistry and Biology.
The Super Lab will be organized into three open areas, with lab tables with power, water, sinks and gas as required to support the three sciences.
Lab tables will accommodate 30 students, each with at least 915mm linear table space per student.
Students will work in pairs, sharing services at one location for two students.
Benching area will be visible to students in main corridor through large glazed areas to encourage cross-disciplinary interest.

Adjacencies:

The Super Lab will have doors at opposite ends with direct access from the School's main circulation.
All Studios will have direct physical access and a Direct Visual Connection to the Super Lab.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xD7 (Teaching station), 16xL-1a, 7xD-10; counter to be 12.8m in length.
Equipment Provided By School District:		

Equipment Provided By Design Builder:	**Provide 6 dual nozzle gas fixtures, 5 single sinks, 1 fume hood, 1 305mm counter under t.v., 2x 2445X1225 W.B., 1 emergency shower / eyewash, Provide 1 wall mounted t.v.**				
Furniture Provided by School District:	**Provide 28 chairs, 3 work tables**				
Plumbing / Gas	**SK-3 @ 6** **- Refer to Plumbing Fixture Schedules**	**SK-4 @ 7** **- Refer to Plumbing Fixture Schedules**	**NG-1 @ 7** **- Refer to Plumbing Fixture Schedules** **NG-2 @ 5** **- Refer to Plumbing Fixture Schedules**	- All drainage to be Acid Waste pipe and fittings - All drainage to connect to central below grade Acid Neutralizer	**EW-1** **- Refer to Plumbing Fixture Schedules**
Mechanical	**- Common to Science Lab 21.07 and Science Prep 21.10, roof mounted air handling unit, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount, vandal proof, temperature sensor (Non-adjustable)** **- Negative pressurization**	**-** -	**32** Occupant Load	**- 610 l/s to constant volume exhaust energy recovery system** **- Island fume hood** **- Roof mounted, explosion proof, spark resistant, exhaust fan, rated for 350 l/s 375 Pa, vertical discharge velocity stack, local control**	**- Ordinary hazard (Group 1) occupancy fire protection**
Lighting	**2x2 Recessed Architectural luminaires**	**Occupancy Sensor** Wall Pods Dimming	**Emergency Lighting**	**50 fc** -	**-0.6 min/average**
Electrical / Power	**Panel**	**40** Min. Receptacles	**Fume hood** **Lab equipment**	**N/A**	
Aux. Systems / Communications – Security	**3** Min. Data Outlet	**1@2 data/WAP**	**Wall mounted telephone**	**- PA SPKR** -	**- TV and AV speakers** **Document camera**
General Activity	Science Lab				
Electrical / Power Notes	• Provide panel • Provide connections to lab equipment including fume hoods etc • Provide receptacles in millwork for each work station				
Aux. Systems Communications – Security Notes	• Provide TV and ceiling mounted AV speakers • Provide document/demonstration camera				
Special Requirements	• Acoustic separations between adjacent rooms				

	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Doors with Steel Frames and vision panels. • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
21.00 – SCIENCE DEPARTMENT	**21.08 - SCIENCE (Minimum 177m²)**

Overview:

Science Theory Studios will be open classroom spaces for teaching nonspecific science courses.
Each Science Theory Studio will have a teacher demonstration table on a 305mm high raised platform. An adjustable mirror will be provided over the demonstration table.
All Science Theory Studios will have direct access physical and a Direct Visual Connection to the Super Lab.
All Science Theory Studios will have access directly from the Super Lab - Physics / Chemistry / Biology.
All Science Theory Studios will be provided with perimeter lab storage and fixed lab benches
All Science Theory Studios will include a teacher demonstration table with sink and required power, water and gas to support teaching Physics, Chemistry or Biology.
The Super Lab will be an open space to support the three sciences of Physics, Chemistry and Biology.
The Super Lab will be organized into three open areas, with lab tables with power, water, sinks and gas as required to support the three sciences.
Lab tables will accommodate 30 students, each with at least 915mm linear table space per student.
Students will work in pairs, sharing services at one location for two students.
Benching area will be visible to students in main corridor through large glazed areas to encourage cross-disciplinary interest.

Adjacencies:

The Super Lab will have doors at opposite ends with direct access from the School's main circulation.
All Studios will have direct physical access and a Direct Visual Connection to the Super Lab.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xD7 (Teaching station), 16xL-1a, 7xD-10; counter to be 12.8m in length.
Equipment		

Provided By School District:					
Equipment Provided By Design Builder:	**Provide 6 dual nozzle gas fixtures, 5 single sinks, 1 fume hood, 1 wall mounted t.v., 1 305mm counter under t.v., 2x 2445X1225 W.B., 1 emergency shower / eyewash**				
Furniture Provided by School District:	**Provide 28 chairs, 3 work tables**				
Plumbing / Gas	**SK-3 @ 6** **- Refer to Plumbing Fixture Schedules**	**SK-4 @ 7** **- Refer to Plumbing Fixture Schedules**	**NG-1 @ 7** **- Refer to Plumbing Fixture Schedules** **NG-2 @ 5** **- Refer to Plumbing Fixture Schedules**	- All drainage to be Acid Waste pipe and fittings - All drainage to connect to central below grade Acid Neutralizer	**EW-1** **- Refer to Plumbing Fixture Schedules**
Mechanical	**- Common to Science Lab 21.08 and Science Prep 21.14, roof mounted air handling unit, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount, vandal proof, temperature sensor (Non-adjustable)** **- Negative pressurization**	- -	**32** Occupant Load	**- 610 l/s to constant volume exhaust energy recovery system** **- Island fume hood** **- Roof mounted, explosion proof, spark resistant, exhaust fan, rated for 350 l/s 375 Pa, vertical discharge velocity stack, local control**	**- Ordinary hazard (Group 1) occupancy fire protection**
Lighting	**2x2 Recessed Architectural luminaires**	**Occupancy Sensor** Wall Pods Dimming	**Emergency Lighting**	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**Panel**	**40** Min. Receptacles	**Fume** **Lab equipment**		
Aux. Systems / Communications – Security	**3** Min. Data Outlet	**1@2 data/WAP**	**Wall mounted telephone**	**- PA SPKR** -	**- TV and AV speakers** **Document camera** -
General Activity	Science Lab				
Electrical / Power Notes	• Provide panel • Provide connections to lab equipment including fume hoods etc • Provide receptacles in millwork for each work station				
Aux. Systems Communications – Security Notes	• Provide TV and ceiling mounted AV speakers • Provide document/demonstration camera				
Special Requirements	• Acoustic separations between adjacent rooms				

	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Doors with Steel Frames and vision panels. • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
21.00 – SCIENCE DEPARTMENT	**21.09 – CHEM. STORAGE (Minimum 17m²)**

Overview:

This space will be a secured room for safe storage for chemicals

This room will include a double-sided fume hood, accessed from both the Chemical Storage room and the Super Lab.

The Chemical Storage perimeter requires lab millwork cabinetry, countertops and shelving.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:		Provide 2 chemical storage cabinets				
Equipment Provided By Design Builder:						
Furniture Provided by School District:		5 shelving units				
Plumbing / Gas		AN-1 - Refer to Plumbing Fixture Schedules	SI-1 - Refer to Plumbing Fixture Schedules	- Chemical storage cabinet vented directly to outdoors	- -	- -
Mechanical		- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- -	n/a Occupant Load	- 140 l/s to constant volume exhaust to roof mounted fan	- -
Lighting		2x2 Recessed Luminaires	Occupancy Sensor Wall Pods		50fc	- -
Electrical / Power		N/A	3 Min. Receptacles	N/A	N/A	
Aux. Systems / Communications – Security		0 Min. Data Outlets			- PA SPKR -	- -
General Activity		Science Lab chemical storage				
Electrical / Power Notes		• Provide general use receptacles				
Aux. Systems Communications –		• PA speaker				

Security Notes	
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame.

Functional Area	Functional Unit
21.00 – SCIENCE DEPARTMENT	**21.10 – SCIENCE PREP (Minimum 42m²)**

Overview:

The Prep / Storage 1 space will include two areas within a single room, for biology and chemistry storage, and for physics and general science storage.

Adjacencies:

The Prep / Storage 1 space will have access to the Chemical Storage room
The Prep / Storage 1 space will be centralized between Studios to provide equal access to all areas of the Super Lab and Studios

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		12xU-1, 3xU-4; counter to be a total length of 7300mm. 2xL-5a (each unit to be 2500mm in length)
Equipment Provided By School District:		Provide 2 refrigerators
Equipment Provided By Design Builder:		Provide 3 dual nozzle gas fixtures, 2 single sinks, 1 double sink, 1 2-way fume hood
Furniture Provided by School District:		Provide 28 chairs, 3 work tables

Plumbing / Gas	SK-3 @ 2 - Refer to Plumbing Fixture Schedules	SK-8 - Refer to Plumbing Fixture Schedules	NG-2 @ 2 - Refer to Plumbing Fixture Schedules	- All drainage to be Acid Waste pipe and fittings - All drainage to connect to central below grade Acid Neutralizer	
Mechanical	- Common to Science Lab 21.07 and Science Prep 21.10, roof mounted air handling unit, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount, vandal proof, temperature	- -	32 Occupant Load	- Pass-through fume hood, refer to 21.06 - Science	- Ordinary hazard (Group 1) occupancy fire protection

	sensor (Non-adjustable) **- Negative pressurization**				
Lighting	**2x2 Recessed**	**Occupancy Sensor** Wall Pods Dimming	**Emergency Lighting**	**50fc**	**-0.6 min/average** -
Electrical / Power	**Panel L**	**10** Min. Receptacles	N/A	**Refrigerators** **Lab equipment**	
Aux. Systems / Communications – Security	**8** Min. Data Outlets		**Wall mounted telephone**	**- PA SPKR** -	**-** -
General Activity	Science Lab prep				
Electrical / Power Notes	• Provide panel – coordinate with adjacent spaces • Provide connection to all lab equipment and refrigerators				
Aux. Systems Communications – Security Notes	• Provide outlets for work stations • PA speaker				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

Functional Area	Functional Unit
21.00 – SCIENCE DEPARTMENT	**21.11 – ACCESS (Minimum 31m²)**

Overview: A centralized leading access corridor between science room(s).

Adjacencies: Refer to adjacency diagram.

Finishes	**Floor**	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		- -	- -	- -	- -	- -
Mechanical		-	- -	N/A Occupant Load	no Special Exhaust	- -
Lighting		2x2 Recessed	Occupancy sensor	Emergency Lighting	50 fc -	-0.4 min/average -
Electrical / Power		N/A	2 Min. Receptacles	N/A	N/A	1 Speaker
Aux. Systems / Communications – Security		0 Min. Data Outlet			- PA SPKR -	- -
General Activity		Science Lab access corridor				
Electrical / Power Notes		• Provide general use receptacles				
Aux. Systems Communications – Security Notes		• PA speaker				
Special Requirements		• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide **Wood Door with Steel Frame and vision panel.** • Provide corner guards at all exterior corners of interior walls				

Functional Area	Functional Unit
21.00 – SCIENCE DEPARTMENT	**21.12 – ACCESS (Minimum 29m²)**

Overview: A centralized leading access corridor between science room(s).

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	T-Bar (1220mm x 610mm)			
Ceiling Height Minimum		3050mm			
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:					
Furniture Provided by School District:					
Plumbing / Gas		- -	- -	- -	- -	- -
Mechanical		-	- -	N/A Occupant Load	no Special Exhaust	- -
Lighting		2x2 Recessed Luminaires	Occupancy sensors	Emergency Lighting	50 fc -	-0.4 min/average -
Electrical / Power		N/A	2 Min. Receptacles	N/A	N/A	
Aux. Systems / Communications – Security		0 Min. Data Outlet			- PA SPKR -	- -

General Activity	Science Lab access corridor
Electrical / Power Notes	• Provide general use receptacles
Aux. Systems Communications – Security Notes	• PA speaker
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide **Wood Door with Steel Frame and vision panel.** • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
21.00 – SCIENCE DEPARTMENT	**21.13 – ACCESS (Minimum 31m²)**

Overview: A centralized leading access corridor between science room(s).

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		- -	- -	- -	- -	- -
Mechanical		-	- -	N/A Occupant Load	no Special Exhaust	- -
Lighting		2x2 Recessed Luminaires	Occupancy sensors	Emergency Lighting	50 fc -	-0.4 min/average -
Electrical / Power		N/A	2 Min. Receptacles	N/A	N/A	
Aux. Systems / Communications – Security		0 Min. Data Outlet			- PA SPKR -	- -
General Activity		Science Lab access corridor				
Electrical / Power Notes		• Provide general use receptacles				
Aux. Systems Communications – Security Notes		• PA speaker				
Special Requirements		• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide **Wood Door with Steel Frame and vision panel.** • Provide corner guards at all exterior corners of interior walls				

Functional Area	Functional Unit
21.00 – SCIENCE DEPARTMENT	**21.14 – SCIENCE PREP (Minimum 42m²)**

Overview:

The Prep / Storage 1 space will include two areas within a single room, for biology and chemistry storage, and for physics and general science storage.

Adjacencies:

The Prep / Storage 1 space will have access to the Chemical Storage room
The Prep / Storage 1 space will be centralized between Studios to provide equal access to all areas of the Super Lab and Studios

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		12xU-1, 3xU-4; counter to be a total length of 7300mm. 2xL-5a (each unit to be 2500mm in length)
Equipment Provided By School District:		
Equipment Provided By Design Builder:		Provide 2 refrigerators Provide 3 dual nozzle gas fixtures, 2 single sinks, 1 double sink, 1 2-way fume hood
Furniture Provided by School District:		Provide 28 chairs, 3 work tables

Plumbing / Gas	SK-3 @ 2 - Refer to Plumbing Fixture Schedules	SK-8 - Refer to Plumbing Fixture Schedules	NG-2 @ 2 - Refer to Plumbing Fixture Schedules	- All drainage to be Acid Waste pipe and fittings - All drainage to connect to central below grade Acid Neutralizer	
Mechanical	- Common to Science Lab 21.01 and Science Prep 21.14, roof mounted air handling unit, heating/cooling, MERV 13 filtration - High supply, low level return, 1.2 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC	-	32 Occupant Load	- Pass-through fume hood, refer to 21.01 - Science	- Ordinary hazard (Group 1) occupancy fire protection

	- Wall mount, vandal proof, temperature sensor (Non-adjustable) **- Negative pressurization**				
Lighting	**2x2 Recessed Architectural luminaires**	**Occupancy Sensor** Wall Pods Dimming	**Emergency Lighting**	**50fc**	**-0.6 min/average** -
Electrical / Power	**N/A**	**10** Min. Receptacles	N/A	**Refrigerators** **Lab equipment**	
Aux. Systems / Communications – Security	**8** Min. Data Outlets		**Wall mounted telephone**	**- PA SPKR** -	**-** -
General Activity	Science Lab prep				
Electrical / Power Notes	• Provide connection to refrigerators and lab equipment • Provide outlets for work stations				
Aux. Systems Communications – Security Notes	• Provide outlets for work stations • PA speaker				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

Functional Area	Functional Unit
21.00 – SCIENCE DEPARTMENT	**21.15 – CHEM. STORAGE (Minimum 17m²)**

Overview:

This space will be a secured room for safe storage for chemicals
This room will include a double-sided fume hood, accessed from both the Chemical Storage room and the Super Lab.
The Chemical Storage perimeter requires lab millwork cabinetry, countertops and shelving.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	T-Bar (1220mm x 610mm)			
Ceiling Height Minimum		3050mm			
Millwork					
Equipment Provided By School District:		Provide 2 chemical storage cabinets			
Equipment Provided By Design Builder:					
Furniture Provided by School District:		5 shelving units			
Plumbing / Gas		- Chemical storage cabinet vented directly to outdoors	-	-	-
Mechanical		- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	-	n/a Occupant Load	- 140 l/s to constant volume exhaust to roof mounted fan
Lighting		2x2 Recessed	Occupancy Sensor Wall Pods		50fc
Electrical / Power		N/A	3 Min. Receptacles	N/A	N/A
Aux. Systems / Communications – Security		0 Min. Data Outlets			- PA SPKR
General Activity		Science Lab chemical storage			
Electrical / Power Notes		• Provide general use receptacles			
Aux. Systems Communications – Security Notes		• PA speaker			
Special Requirements		• Acoustic separations between adjacent rooms			

	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame.

22.00 Learning Communities (Classrooms)

Functional Area	Functional Unit
22.00 – LEARNING COMMUNITIES (CLASSROOMS)	**22.01 – GENERAL INSTRUCTION (Minimum 80m²)**

Overview:

Classrooms will be arranged as modules of 30 students each with supporting spaces for each module. These modules, referred to as Learning Communities, will allow for stronger student-instructor relationships and to support social bubbles
The Learning Communities will each be unique to allow for differentiated instruction.
Flex Classrooms will be located on different levels.
Flex Classrooms will provide general instruction space and be outfitted with AV equipment to allow for hybrid/blended learning.
Classrooms will be interdisciplinary and non-department specific.
At least one Classroom per Learning Community will be designed to facilitate vertical learning with dry-erase, writeable surfaces on all sides. Glazing may serve as a writing surface.
Classrooms will have whiteboard surfaces as outlined on two or more walls.
Provide full width operable wall between adjacent classrooms so that each classroom can be combined for team teaching with a minimum of 1 other classroom. Prioritize combining differentiated classrooms within Learning Communities over combining identical classrooms.

Adjacencies:

All Classrooms will have Direct Visual Connections to the main corridor(s) and flex spaces / break out spaces that are adjacent to the classrooms.
One classroom will be able to be combined with adjacent Classroom by way of an operable wall partition.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xL-1a; counter length to be 630mm.
Equipment Provided By School District:		Supply 1 Wireless Access Point Provide 1 wall mounted t.v.
Equipment Provided By Design Builder:		Provide 1 305mm counter under t.v., 2x 2445x1225 W.B.,

Furniture Provided by School District:	**Provide 1 teaching station, 15 tables, 30 chairs**				
Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**	- -	**32** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average**
Electrical / Power	**N/A**	**10** Min. Receptacles	-	**N/A** -	**N/A**
Aux. Systems / Communications – Security	**5** Min. Data Outlets	**2 data/WAP**	Wall mounted telephone	**- PA SPKR**	**- TV** Speakers
General Activity	General classroom				
Electrical / Power Notes	• Provide general use receptacles.				
Aux. Systems Communications – Security Notes	• PA speaker • Wall mounted telephone at room entrance. • TV and ceiling presentation speakers. • Document camera. • Controls for AV in teacher station.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

	• Provide top hung operable wall between adjacent general instruction rooms • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
22.00 – LEARNING COMMUNITIES (CLASSROOMS)	**22.02 – GENERAL INSTRUCTION (Minimum 80m²)**

Overview:

Classrooms will be arranged as modules of 30 students each with supporting spaces for each module. These modules, referred to as Learning Communities, will allow for stronger student-instructor relationships and to support social bubbles
The Learning Communities will each be unique to allow for differentiated instruction.
Flex Classrooms will be located on different levels.
Flex Classrooms will provide general instruction space and be outfitted with AV equipment to allow for hybrid/blended learning.
Classrooms will be interdisciplinary and non-department specific.
At least one Classroom per Learning Community will be designed to facilitate vertical learning with dry-erase, writeable surfaces on all sides. Glazing may serve as a writing surface.
Classrooms will have whiteboard surfaces as outlined on two or more walls.
Provide full width operable wall between adjacent classrooms so that each classroom can be combined for team teaching with a minimum of 1 other classroom. Prioritize combining differentiated classrooms within Learning Communities over combining identical classrooms.

Adjacencies:

All Classrooms will have Direct Visual Connections to the main corridor(s) and flex spaces / break out spaces that are adjacent to the classrooms.
One classroom will be able to be combined with adjacent Classroom by way of an operable wall partition.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xL-1a; counter length to be 630mm.
Equipment Provided By School District:		Supply 1 Wireless Access Point Provide 1 wall mounted TV
Equipment Provided By Design Builder:		Provide 1 305mm counter under t.v., 2x 2445x1225 W.B.,
Furniture Provided by School District:		Provide 1 teaching station, 15 tables, 30 chairs

Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**	- -	**32** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average**
Electrical / Power	**N/A**	**10** Min. Receptacles		**N/A** -	**N/A**
Aux. Systems / Communications – Security	**5** Min. Data Outlets	**1@2 data/WAP**	Wall mounted telephone	**- PA SPKR**	**- TV** Speakers
General Activity	General classroom				
Electrical / Power Notes	• Provide general use receptacles.				
Aux. Systems Communications – Security Notes	• PA speaker • Wall mounted telephone at room entrance. • TV and ceiling presentation speakers. • Document camera. • Controls for AV in teacher station.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

	• Provide top hung operable wall between adjacent general instruction rooms • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
22.00 – LEARNING COMMUNITIES (CLASSROOMS)	**22.03 – GENERAL INSTRUCTION (Minimum 80m²)**

Overview:

Classrooms will be arranged as modules of 30 students each with supporting spaces for each module. These modules, referred to as Learning Communities, will allow for stronger student-instructor relationships and to support social bubbles
The Learning Communities will each be unique to allow for differentiated instruction.
Flex Classrooms will be located on different levels.
Flex Classrooms will provide general instruction space and be outfitted with AV equipment to allow for hybrid/blended learning.
Classrooms will be interdisciplinary and non-department specific.
At least one Classroom per Learning Community will be designed to facilitate vertical learning with dry-erase, writeable surfaces on all sides. Glazing may serve as a writing surface.
Classrooms will have whiteboard surfaces as outlined on two or more walls.

Adjacencies:

All Classrooms will have Direct Visual Connections to the main corridor(s) and flex spaces / break out spaces that are adjacent to the classrooms.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xL-1a; counter length to be 630mm.
Equipment Provided By School District:		Supply 1 Wireless Access Point – Installation by Design Builder
Equipment Provided By Design Builder:		Provide 1 305mm counter under t.v., 2x 2445x1225 W.B.,
Furniture Provided by School District:		Provide 1 teaching station, 15 tables, 30 chairs
Plumbing / Gas	- -	- - - - - - - - - -

Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**	**-** -	**32** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average**
Electrical / Power	**N/A**	**10** Min. Receptacles	-	**N/A** -	**N/A**
Aux. Systems / Communications – Security	**5** Min. Data Outlets	**1@2 data/WAP**	**Wall mounted telephone**	**- PA SPKR**	**- TV** Speakers
General Activity	General classroom				
Electrical / Power Notes	• Provide receptacles for general use.				
Aux. Systems Communications – Security Notes	• PA speaker • Wall mounted telephone at room entrance. • TV and ceiling presentation speakers. • Document camera. • Controls for AV in teacher station.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. • Provide corner guards at all exterior corners of interior walls				

Functional Area	Functional Unit
22.00 – LEARNING COMMUNITIES (CLASSROOMS)	**22.04 – GENERAL INSTRUCTION (Minimum 80m²)**

Overview:

Classrooms will be arranged as modules of 30 students each with supporting spaces for each module. These modules, referred to as Learning Communities, will allow for stronger student-instructor relationships and to support social bubbles
The Learning Communities will each be unique to allow for differentiated instruction.
Flex Classrooms will be located on different levels.
Flex Classrooms will provide general instruction space and be outfitted with AV equipment to allow for hybrid/blended learning.
Classrooms will be interdisciplinary and non-department specific.
At least one Classroom per Learning Community will be designed to facilitate vertical learning with dry-erase, writeable surfaces on all sides. Glazing may serve as a writing surface.
Classrooms will have whiteboard surfaces as outlined on two or more walls.

Adjacencies:

All Classrooms will have Direct Visual Connections to the main corridor(s) and flex spaces / break out spaces that are adjacent to the classrooms.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xL-1a; counter length to be 630mm.
Equipment Provided By School District:		Supply 1 Wireless Access Point Provide 1 wall mounted TV
Equipment Provided By Design Builder:		Provide 1 305mm counter under t.v., 2x 2445x1225 W.B.,
Furniture Provided by School District:		Provide 1 teaching station, 15 tables, 30 chairs
Plumbing / Gas		

Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**	**-** -	**32** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average**
Electrical / Power	**N/A**	**7** Min. Receptacles		**N/A** -	**3 Speakers** **1 TV**
Aux. Systems / Communications – Security	**5** Min. Data Outlets	1@2 data/WAP	**Wall mounted telephone**	**- PA SPKR** -	**- TV** Speakers -
General Activity	General classroom				
Electrical / Power Notes	• Provide receptacles for general use.				
Aux. Systems Communications – Security Notes	• PA speaker • Wall mounted telephone at room entrance. • TV and ceiling presentation speakers. • Document camera. • Controls for AV in teacher station.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. • Provide corner guards at all exterior corners of interior walls				

Functional Area	Functional Unit
22.00 – LEARNING COMMUNITIES (CLASSROOMS)	**22.05 – GENERAL INSTRUCTION (Minimum 80m²)**

Overview:

Classrooms will be arranged as modules of 30 students each with supporting spaces for each module. These modules, referred to as Learning Communities, will allow for stronger student-instructor relationships and to support social bubbles
The Learning Communities will each be unique to allow for differentiated instruction.
Flex Classrooms will be located on different levels.
Flex Classrooms will provide general instruction space and be outfitted with AV equipment to allow for hybrid/blended learning.
Classrooms will be interdisciplinary and non-department specific.
At least one Classroom per Learning Community will be designed to facilitate vertical learning with dry-erase, writeable surfaces on all sides. Glazing may serve as a writing surface.
Classrooms will have whiteboard surfaces as outlined two or more walls.
Provide full width operable wall between adjacent classrooms so that each classroom can be combined for team teaching with a minimum of 1 other classroom. Prioritize combining differentiated classrooms within Learning Communities over combining identical classrooms.

Adjacencies:

All Classrooms will have Direct Visual Connections to the main corridor(s) and flex spaces / break out spaces that are adjacent to the classrooms.
One classroom will be able to be combined with adjacent Classroom by way of an operable wall partition.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xL-1a; counter length to be 630mm.
Equipment Provided By School District:		Supply 1 Wireless Access Point Provide 1 wall mounted TV
Equipment Provided By Design Builder:		Provide 1 305mm counter under t.v., 2x 2445x1225 W.B.,
Furniture Provided by School District:		Provide 1 teaching station, 15 tables, 30 chairs

Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**	- -	**32** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average**
Electrical / Power	**N/A**	**10** Min. Receptacles		**N/A**	**N/A**
Aux. Systems / Communications – Security	**5** Min. Data Outlets	**10** Min. Tel. Outlets	**0** Min Cable Outlets	**- PA SPKR**	**- TV** Speakers
General Activity	General classroom				
Electrical / Power Notes	• Provide receptacles for general use.				
Aux. Systems Communications – Security Notes	• PA speaker • Wall mounted telephone at room entrance. • TV and ceiling presentation speakers. • Document camera. • Controls for AV in teacher station.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

	• Provide top hung operable wall between adjacent general instruction rooms • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
22.00 – LEARNING COMMUNITIES (CLASSROOMS)	**22.06 – GENERAL INSTRUCTION (Minimum 80m²)**

Overview:

Classrooms will be arranged as modules of 30 students each with supporting spaces for each module. These modules, referred to as Learning Communities, will allow for stronger student-instructor relationships and to support social bubbles
The Learning Communities will each be unique to allow for differentiated instruction.
Flex Classrooms will be located on different levels.
Flex Classrooms will provide general instruction space and be outfitted with AV equipment to allow for hybrid/blended learning.
Classrooms will be interdisciplinary and non-department specific.
At least one Classroom per Learning Community will be designed to facilitate vertical learning with dry-erase, writeable surfaces on all sides. Glazing may serve as a writing surface.
Classrooms will have whiteboard surfaces as outlined on two or more walls.

Adjacencies:

All Classrooms will have Direct Visual Connections to the main corridor(s) and flex spaces / break out spaces that are adjacent to the classrooms.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xL-1a; counter length to be 630mm.
Equipment Provided By School District:		Supply 1 Wireless Access Point Provide 1 wall mounted TV
Equipment Provided By Design Builder:		Provide 1 305mm counter under t.v., 2x 2445x1225 W.B.,
Furniture Provided by School District:		Provide 1 teaching station, 15 tables, 30 chairs
Plumbing / Gas	- -	- - - - - - - - - -

Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**	- -	**32** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A**	**10** Min. Receptacles		**N/A**	**3 Speakers** **1 TV**
Aux. Systems / Communications – Security	**5** Min. Data Outlets	**1@2 data/WAP**	**Wall mounted telephone**	**- PA SPKR** -	**- TV** Speakers -
General Activity	General classroom				
Electrical / Power Notes	• Provide receptacles for general use.				
Aux. Systems Communications – Security Notes	• PA speaker • Wall mounted telephone at room entrance. • TV and ceiling presentation speakers. • Document camera. • Controls for AV in teacher station.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. • Provide corner guards at all exterior corners of interior walls				

Functional Area	Functional Unit
22.00 – LEARNING COMMUNITIES (CLASSROOMS)	**22.07 – GENERAL INSTRUCTION (Minimum 80m²)**

Overview:

Classrooms will be arranged as modules of 30 students each with supporting spaces for each module. These modules, referred to as Learning Communities, will allow for stronger student-instructor relationships and to support social bubbles
The Learning Communities will each be unique to allow for differentiated instruction.
Flex Classrooms will be located on different levels.
Flex Classrooms will provide general instruction space and be outfitted with AV equipment to allow for hybrid/blended learning.
Classrooms will be interdisciplinary and non-department specific.
At least one Classroom per Learning Community will be designed to facilitate vertical learning with dry-erase, writeable surfaces on all sides. Glazing may serve as a writing surface.
Classrooms will have whiteboard surfaces as outlined on two or more walls.

Adjacencies:

All Classrooms will have Direct Visual Connections to the main corridor(s) and flex spaces / break out spaces that are adjacent to the classrooms.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xL-1a; counter length to be 630mm.
Equipment Provided By School District:		Supply 1 Wireless Access Point Provide 1 wall mounted t.v.
Equipment Provided By Design Builder:		Provide 1 305mm counter under t.v., 2x 2445x1225 W.B.,
Furniture Provided by School District:		Provide 1 teaching station, 15 tables, 30 chairs
Plumbing / Gas	- -	- - - - - - - - - -

Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**	**-** -	**32** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average**
Electrical / Power	**N/A**	**10** Min. Receptacles		**N/A**	**3 Speakers** **1 TV**
Aux. Systems / Communications – Security	**5** Min. Data Outlets	**1@2 data/WAP**	**Wall mounted telephone**	**- PA SPKR** -	**- TV** Speakers -
General Activity	General classroom				
Electrical / Power Notes	• Provide receptacles for general use.				
Aux. Systems Communications – Security Notes	• PA speaker • Wall mounted telephone at room entrance. • TV and ceiling presentation speakers. • Document camera. • Controls for AV in teacher station.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. • Provide corner guards at all exterior corners of interior walls				

Functional Area	Functional Unit
22.00 – LEARNING COMMUNITIES (CLASSROOMS)	**22.08 – GENERAL INSTRUCTION (Minimum 80m²)**

Overview:

Classrooms will be arranged as modules of 30 students each with supporting spaces for each module. These modules, referred to as Learning Communities, will allow for stronger student-instructor relationships and to support social bubbles
The Learning Communities will each be unique to allow for differentiated instruction.
Flex Classrooms will be located on different levels.
Flex Classrooms will provide general instruction space and be outfitted with AV equipment to allow for hybrid/blended learning.
Classrooms will be interdisciplinary and non-department specific.
At least one Classroom per Learning Community will be designed to facilitate vertical learning with dry-erase, writeable surfaces on all sides. Glazing may serve as a writing surface.
Classrooms will have whiteboard surfaces as outlined two or more walls.
Provide full width operable wall between adjacent classrooms so that each classroom can be combined for team teaching with a minimum of 1 other classroom. Prioritize combining differentiated classrooms within Learning Communities over combining identical classrooms.

Adjacencies:

All Classrooms will have Direct Visual Connections to the main corridor(s) and flex spaces / break out spaces that are adjacent to the classrooms.
One classroom will be able to be combined with adjacent Classroom by way of an operable wall partition.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xL-1a; counter length to be 630mm.
Equipment Provided By School District:		Supply 1 Wireless Access Point Provide 1 wall mounted t.v.
Equipment Provided By Design Builder:		Provide 1 305mm counter under t.v., 2x 2445x1225 W.B.,
Furniture Provided by School District:		Provide 1 teaching station, 15 tables, 30 chairs

Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**	- -	**32** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average**
Electrical / Power	**N/A**	**10** Min. Receptacles		**N/A**	**N/A**
Aux. Systems / Communications – Security	**5** Min. Data Outlets	**1@2 data/WAP**	**Wall mounted telephone**	**- PA SPKR**	**- TV** Speakers -
General Activity	General classroom				
Electrical / Power Notes	• Provide receptacles for general use.				
Aux. Systems Communications – Security Notes	• PA speaker • Wall mounted telephone at room entrance. • TV and ceiling presentation speakers. • Document camera. • Controls for AV in teacher station.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

	• Provide top hung operable wall between adjacent general instruction rooms • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
22.00 – LEARNING COMMUNITIES (CLASSROOMS)	**22.09 – GENERAL INSTRUCTION (Minimum 80m²)**

Overview:

Classrooms will be arranged as modules of 30 students each with supporting spaces for each module. These modules, referred to as Learning Communities, will allow for stronger student-instructor relationships and to support social bubbles
The Learning Communities will each be unique to allow for differentiated instruction.
Flex Classrooms will be located on different levels.
Flex Classrooms will provide general instruction space and be outfitted with AV equipment to allow for hybrid/blended learning.
Classrooms will be interdisciplinary and non-department specific.
At least one Classroom per Learning Community will be designed to facilitate vertical learning with dry-erase, writeable surfaces on all sides. Glazing may serve as a writing surface.
Classrooms will have whiteboard surfaces as outlined on two or more walls.
Provide full width operable wall between adjacent classrooms so that each classroom can be combined for team teaching with a minimum of 1 other classroom. Prioritize combining differentiated classrooms within Learning Communities over combining identical classrooms.

Adjacencies:

All Classrooms will have Direct Visual Connections to the main corridor(s) and flex spaces / break out spaces that are adjacent to the classrooms.
One classroom will be able to be combined with adjacent Classroom by way of an operable wall partition.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xL-1a; counter length to be 630mm.
Equipment Provided By School District:		Supply 1 Wireless Access Provide 1 wall mounted t.v.
Equipment Provided By Design Builder:		Provide 1 305mm counter under t.v., 2x 2445x1225 W.B.,
Furniture		

Provided by School District:	**Provide 1 teaching station, 15 tables, 30 chairs**				
Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**	- -	**32** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average**
Electrical / Power	**N/A**	**10** Min. Receptacles		**N/A**	**N/A**
Aux. Systems / Communications – Security	**5** Min. Data Outlets	**1@2data/WAP**	**Wall mounted telephone**	**- PA SPKR**	**- TV** Speakers
General Activity	General classroom				
Electrical / Power Notes	• Provide receptacles for general use.				
Aux. Systems Communications – Security Notes	• PA speaker • Wall mounted telephone at room entrance. • TV and ceiling presentation speakers. • Document camera. • Controls for AV in teacher station.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

	• Provide top hung operable wall between adjacent general instruction rooms • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
22.00 – LEARNING COMMUNITIES (CLASSROOMS)	**22.10 – GENERAL INSTRUCTION (Minimum 80m²)**

Overview:

Classrooms will be arranged as modules of 30 students each with supporting spaces for each module. These modules, referred to as Learning Communities, will allow for stronger student-instructor relationships and to support social bubbles
The Learning Communities will each be unique to allow for differentiated instruction.
Flex Classrooms will be located on different levels.
Flex Classrooms will provide general instruction space and be outfitted with AV equipment to allow for hybrid/blended learning.
Classrooms will be interdisciplinary and non-department specific.
At least one Classroom per Learning Community will be designed to facilitate vertical learning with dry-erase, writeable surfaces on all sides. Glazing may serve as a writing surface.
Classrooms will have whiteboard surfaces as outlined on two or more walls.
Provide full width operable wall between adjacent classrooms so that each classroom can be combined for team teaching with a minimum of 1 other classroom. Prioritize combining differentiated classrooms within Learning Communities over combining identical classrooms.

Adjacencies:

All Classrooms will have Direct Visual Connections to the main corridor(s) and flex spaces / break out spaces that are adjacent to the classrooms.
One classroom will be able to be combined with adjacent Classroom by way of an operable wall partition.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xL-1a; counter length to be 630mm.
Equipment Provided By School District:		Supply 1 Wireless Access Point Provide 1 wall mounted t.v.
Equipment Provided By Design Builder:		Provide 1 305mm counter under t.v., 2x 2445x1225 W.B.
Furniture		

Provided by School District:	**Provide 1 teaching station, 15 tables, 30 chairs**				
Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**	- -	**32** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	**Architectural 2x2 Recessed.** -	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A**	**10** Min. Receptacles		**N/A** -	**N/A**
Aux. Systems / Communications – Security	**5** Min. Data Outlet	**1@2 data/WAP**	Wall mounted telephone	**- PA SPKR**	**- TV** Speakers
General Activity	General classroom				
Electrical / Power Notes	• Provide receptacles for general use.				
Aux. Systems Communications – Security Notes	• PA speaker • Wall mounted telephone at room entrance. • TV and ceiling presentation speakers. • Document camera. • Controls for AV in teacher station.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

	• Provide top hung operable wall between adjacent general instruction rooms • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
22.00 – LEARNING COMMUNITIES (CLASSROOMS)	**22.11 – GENERAL INSTRUCTION (Minimum 80m²)**

Overview:

Classrooms will be arranged as modules of 30 students each with supporting spaces for each module. These modules, referred to as Learning Communities, will allow for stronger student-instructor relationships and to support social bubbles
The Learning Communities will each be unique to allow for differentiated instruction.
Flex Classrooms will be located on different levels.
Flex Classrooms will provide general instruction space and be outfitted with AV equipment to allow for hybrid/blended learning.
Classrooms will be interdisciplinary and non-department specific.
At least one Classroom per Learning Community will be designed to facilitate vertical learning with dry-erase, writeable surfaces on all sides. Glazing may serve as a writing surface.
Classrooms will have whiteboard surfaces as outlined two or more walls.
Provide full width operable wall between adjacent classrooms so that each classroom can be combined for team teaching with a minimum of 1 other classroom. Prioritize combining differentiated classrooms within Learning Communities over combining identical classrooms.

Adjacencies:

All Classrooms will have Direct Visual Connections to the main corridor(s) and flex spaces / break out spaces that are adjacent to the classrooms.
One classroom will be able to be combined with adjacent Classroom by way of an operable wall partition.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xL-1a; counter length to be 630mm.
Equipment Provided By School District:		Supply 1 Wireless Access Point Provide 1 wall mounted t.v.
Equipment Provided By Design Builder:		Provide 1 305mm counter under t.v., 2x 2445x1225 W.B.,
Furniture		

Provided by School District:	**Provide 1 teaching station, 15 tables, 30 chairs**				
Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**	- -	**32** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	**Architectural 2x2 Recessed.**	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average**
Electrical / Power	**N/A**	**10** Min. Receptacles		**N/A** -	**N/A**
Aux. Systems / Communications – Security	**5** Min. Data Outlet	1@2 data/WAP	Wall mounted telephone	**- PA SPKR**	**- TV** Speakers
General Activity	General classroom				
Electrical / Power Notes	• Provide receptacles for general use.				
Aux. Systems Communications – Security Notes	• PA speaker • Wall mounted telephone at room entrance. • TV and ceiling presentation speakers. • Document camera. • Controls for AV in teacher station.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

	• Provide top hung operable wall between adjacent general instruction rooms • Provide corner guards at all exterior corners of interior walls • Wall Mounted TV to be installed by Design Builder.

Functional Area	Functional Unit
22.00 – LEARNING COMMUNITIES (CLASSROOMS)	**22.12 – GENERAL INSTRUCTION (Minimum 80m²)**

Overview:

Classrooms will be arranged as modules of 30 students each with supporting spaces for each module. These modules, referred to as Learning Communities, will allow for stronger student-instructor relationships and to support social bubbles
The Learning Communities will each be unique to allow for differentiated instruction.
Flex Classrooms will be located on different levels.
Flex Classrooms will provide general instruction space and be outfitted with AV equipment to allow for hybrid/blended learning.
Classrooms will be interdisciplinary and non-department specific.
At least one Classroom per Learning Community will be designed to facilitate vertical learning with dry-erase, writeable surfaces on all sides. Glazing may serve as a writing surface.
Classrooms will have whiteboard surfaces as outlined on two or more walls.

Adjacencies:

All Classrooms will have Direct Visual Connections to the main corridor(s) and flex spaces / break out spaces that are adjacent to the classrooms.
One classroom will be able to be combined with adjacent Classroom by way of an operable wall partition.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xL-1a; counter length to be 630mm.
Equipment Provided By School District:		Supply 1 Wireless Access Point Provide 1 wall mounted t.v.
Equipment Provided By Design Builder:		Provide 1 305mm counter under t.v., 2x 2445x1225 W.B.,
Furniture Provided by School District:		Provide 1 teaching station, 15 tables, 30 chairs
Plumbing / Gas		

Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**	**-** -	**32** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	**Architectural 2x2 Recessed.** -	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average**
Electrical / Power	**N/A**	**10** Min. Receptacles		**N/A** -	**N/A**
Aux. Systems / Communications – Security	**5** Min. Data Outlet	**1@2 data/WAP**	**Wall mounted telephone**	**- PA SPKR**	**- TV** Speakers
General Activity	General classroom				
Electrical / Power Notes	• Provide receptacles for general use.				
Aux. Systems Communications – Security Notes	• PA speaker • Wall mounted telephone at room entrance. • TV and ceiling presentation speakers. • Document camera. • Controls for AV in teacher station.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. • Provide corner guards at all exterior corners of interior walls				

Functional Area	Functional Unit
22.00 – LEARNING COMMUNITIES (CLASSROOMS)	**22.13 – GENERAL INSTRUCTION (Minimum 80m²)**

Overview:

Classrooms will be arranged as modules of 30 students each with supporting spaces for each module. These modules, referred to as Learning Communities, will allow for stronger student-instructor relationships and to support social bubbles
The Learning Communities will each be unique to allow for differentiated instruction.
Flex Classrooms will be located on different levels.
Flex Classrooms will provide general instruction space and be outfitted with AV equipment to allow for hybrid/blended learning.
Classrooms will be interdisciplinary and non-department specific.
At least one Classroom per Learning Community will be designed to facilitate vertical learning with dry-erase, writeable surfaces on all sides. Glazing may serve as a writing surface.
Classrooms will have whiteboard surfaces as outlined on two or more walls.

Adjacencies:

All Classrooms will have Direct Visual Connections to the main corridor(s) and flex spaces / break out spaces that are adjacent to the classrooms.
One classroom will be able to be combined with adjacent Classroom by way of an operable wall partition.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xL-1a; counter length to be 630mm.
Equipment Provided By School District:		Supply 1 Wireless Access Point Provide 1 wall mounted t.v.
Equipment Provided By Design Builder:		Provide 1 305mm counter under t.v., 2x 2445x1225 W.B.,
Furniture Provided by School District:		Provide 1 teaching station, 15 tables, 30 chairs
Plumbing / Gas	- - - - -	

Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**	**-** -	**32** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	**Architectural 2x2 Recessed.** -	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average**
Electrical / Power	**N/A**	**10** Min. Receptacles		**N/A** -	**N/A**
Aux. Systems / Communications – Security	**5** Min. Data Outlet	**1@2 data/WAP**	**Wall mounted telephone**	**- PA SPKR**	**- TV** Speakers
General Activity	General classroom				
Electrical / Power Notes	• Provide receptacles for general use.				
Aux. Systems Communications – Security Notes	• PA speaker • Wall mounted telephone at room entrance. • TV and ceiling presentation speakers. • Document camera. • Controls for AV in teacher station.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. • Provide corner guards at all exterior corners of interior walls				

Functional Area	Functional Unit
22.00 – LEARNING COMMUNITIES (CLASSROOMS)	**22.14 – GENERAL INSTRUCTION (Minimum 80m²)**

Overview:

Classrooms will be arranged as modules of 30 students each with supporting spaces for each module. These modules, referred to as Learning Communities, will allow for stronger student-instructor relationships and to support social bubbles
The Learning Communities will each be unique to allow for differentiated instruction.
Flex Classrooms will be located on different levels.
Flex Classrooms will provide general instruction space and be outfitted with AV equipment to allow for hybrid/blended learning.
Classrooms will be interdisciplinary and non-department specific.
At least one Classroom per Learning Community will be designed to facilitate vertical learning with dry-erase, writeable surfaces on all sides. Glazing may serve as a writing surface.
Classrooms will have whiteboard surfaces as outlined on two or more walls.
Provide full width operable wall between adjacent classrooms so that each classroom can be combined for team teaching with a minimum of 1 other classroom. Prioritize combining differentiated classrooms within Learning Communities over combining identical classrooms.

Adjacencies:

All Classrooms will have Direct Visual Connections to the main corridor(s) and flex spaces / break out spaces that are adjacent to the classrooms.
One classroom will be able to be combined with adjacent Classroom by way of an operable wall partition.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xL-1a; counter length to be 630mm.
Equipment Provided By School District:		Supply 1 Wireless Access Point Provide 1 wall mounted t.v.
Equipment Provided By Design Builder:		Provide 1 305mm counter under t.v., 2x 2445x1225 W.B.,

Furniture Provided by School District:	**Provide 1 teaching station, 15 tables, 30 chairs**				
Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**	- -	**32** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	**Architectural 2x2 Recessed.** -	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A** -	**10** Min. Receptacles		**N/A** -	N/A
Aux. Systems / Communications – Security	**5** Min. Data Outlet	**1@2 data/WAP**	**Wall mounted telephone**	**- PA SPKR**	**- TV** Speakers -
General Activity	General classroom				
Electrical / Power Notes	• Provide receptacles for general use.				
Aux. Systems Communications – Security Notes	• PA speaker • Wall mounted telephone at room entrance. • TV and ceiling presentation speakers. • Document camera. • Controls for AV in teacher station.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates				

	• Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. • Provide top hung operable wall between adjacent general instruction rooms • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
22.00 – LEARNING COMMUNITIES (CLASSROOMS)	**22.15 – GENERAL INSTRUCTION (Minimum 80m²)**

Overview:

Classrooms will be arranged as modules of 30 students each with supporting spaces for each module. These modules, referred to as Learning Communities, will allow for stronger student-instructor relationships and to support social bubbles
The Learning Communities will each be unique to allow for differentiated instruction.
Flex Classrooms will be located on different levels.
Flex Classrooms will provide general instruction space and be outfitted with AV equipment to allow for hybrid/blended learning.
Classrooms will be interdisciplinary and non-department specific.
At least one Classroom per Learning Community will be designed to facilitate vertical learning with dry-erase, writeable surfaces on all sides. Glazing may serve as a writing surface.
Classrooms will have whiteboard surfaces as outlined on two or more walls.
Provide full width operable wall between adjacent classrooms so that each classroom can be combined for team teaching with a minimum of 1 other classroom. Prioritize combining differentiated classrooms within Learning Communities over combining identical classrooms.

Adjacencies:

All Classrooms will have Direct Visual Connections to the main corridor(s) and flex spaces / break out spaces that are adjacent to the classrooms.
One classroom will be able to be combined with adjacent Classroom by way of an operable wall partition.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xL-1a; counter length to be 630mm.
Equipment Provided By School District:		Supply 1 Wireless Access Point Provide 1 wall mounted t.v.
Equipment Provided By Design Builder:		Provide 1 305mm counter under t.v., 2x 2445x1225 W.B.,
Furniture		

Provided by School District:	**Provide 1 teaching station, 15 tables, 30 chairs**				
Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**	- -	**32** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A** -	**10** Min. Receptacles		**N/A** -	N/A
Aux. Systems / Communications – Security	**5** Min. Data Outlet	**1@2 data/WAP**	**Wall mounted telephone**	**- PA SPKR** -	**- TV** Speakers -
General Activity	General classroom				
Electrical / Power Notes	• Provide receptacles for general use.				
Aux. Systems Communications – Security Notes	• PA speaker • Wall mounted telephone at room entrance. • TV and ceiling presentation speakers. • Document camera. • Controls for AV in teacher station.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

	• Provide top hung operable wall between adjacent general instruction rooms • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
22.00 – LEARNING COMMUNITIES (CLASSROOMS)	**22.16 – GENERAL INSTRUCTION (Minimum 80m²)**

Overview:

Classrooms will be arranged as modules of 30 students each with supporting spaces for each module. These modules, referred to as Learning Communities, will allow for stronger student-instructor relationships and to support social bubbles
The Learning Communities will each be unique to allow for differentiated instruction.
Flex Classrooms will be located on different levels.
Flex Classrooms will provide general instruction space and be outfitted with AV equipment to allow for hybrid/blended learning.
Classrooms will be interdisciplinary and non-department specific.
At least one Classroom per Learning Community will be designed to facilitate vertical learning with dry-erase, writeable surfaces on all sides. Glazing may serve as a writing surface.
Classrooms will have whiteboard surfaces as outlined on two or more walls.
Provide full width operable wall between adjacent classrooms so that each classroom can be combined for team teaching with a minimum of 1 other classroom. Prioritize combining differentiated classrooms within Learning Communities over combining identical classrooms.

Adjacencies:

All Classrooms will have Direct Visual Connections to the main corridor(s) and flex spaces / break out spaces that are adjacent to the classrooms.
One classroom will be able to be combined with adjacent Classroom by way of an operable wall partition.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xL-1a; counter length to be 630mm.
Equipment Provided By School District:		Supply 1 Wireless Access Point Provide 1 wall mounted t.v.
Equipment Provided By Design Builder:		Provide 1 305mm counter under t.v., 2x 2445x1225 W.B.,
Furniture		

Provided by School District:	**Provide 1 teaching station, 15 tables, 30 chairs**				
Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**	- -	**32** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	**Architectural 2x2 Recessed** -	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average**
Electrical / Power	**N/A** -	**10** Min. Receptacles		**N/A** -	N/A
Aux. Systems / Communications – Security	**5** Min. Data Outlet	**1@2 data/WAP**	**Wall mounted telephone**	**- PA SPKR**	**- TV** Speakers
General Activity	General classroom				
Electrical / Power Notes	• Provide receptacles for general use.				
Aux. Systems Communications – Security Notes	• PA speaker • Wall mounted telephone at room entrance. • TV and ceiling presentation speakers. • Document camera. • Controls for AV in teacher station.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

	• Provide top hung operable wall between adjacent general instruction rooms • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
22.00 – LEARNING COMMUNITIES (CLASSROOMS)	**22.17 – GENERAL INSTRUCTION (Minimum 80m²)**

Overview:

Classrooms will be arranged as modules of 30 students each with supporting spaces for each module. These modules, referred to as Learning Communities, will allow for stronger student-instructor relationships and to support social bubbles
The Learning Communities will each be unique to allow for differentiated instruction.
Flex Classrooms will be located on different levels.
Flex Classrooms will provide general instruction space and be outfitted with AV equipment to allow for hybrid/blended learning.
Classrooms will be interdisciplinary and non-department specific.
At least one Classroom per Learning Community will be designed to facilitate vertical learning with dry-erase, writeable surfaces on all sides. Glazing may serve as a writing surface.
Classrooms will have whiteboard surfaces as outlined on two or more walls.

Adjacencies:

All Classrooms will have Direct Visual Connections to the main corridor(s) and flex spaces / break out spaces that are adjacent to the classrooms.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xL-1a; counter length to be 630mm.
Equipment Provided By School District:		Supply 1 Wireless Access Point Provide 1 wall mounted t.v.
Equipment Provided By Design Builder:		Provide 1 305mm counter under t.v., 2x 2445x1225 W.B.,
Furniture Provided by School District:		Provide 1 teaching station, 15 tables, 30 chairs
Plumbing / Gas	- -	- - - - - - - - - -

Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**	**-** -	**32** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	**Architectural 2x2 Recessed.**	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A** -	**10** Min. Receptacles		**N/A** -	**N/A**
Aux. Systems / Communications – Security	**5** Min. Data Outlet	**1@2 data/WAP**	**Wall mounted telephone**	**- PA SPKR** -	**- TV** Speakers -
General Activity	General classroom				
Electrical / Power Notes	• Provide receptacles for general use.				
Aux. Systems Communications – Security Notes	• PA speaker • Wall mounted telephone at room entrance. • TV and ceiling presentation speakers. • Document camera. • Controls for AV in teacher station.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. • Provide corner guards at all exterior corners of interior walls				

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Functional Area	Functional Unit
22.00 – LEARNING COMMUNITIES (CLASSROOMS)	**22.18 – GENERAL INSTRUCTION (Minimum 80m²)**

Overview:

Classrooms will be arranged as modules of 30 students each with supporting spaces for each module. These modules, referred to as Learning Communities, will allow for stronger student-instructor relationships and to support social bubbles
The Learning Communities will each be unique to allow for differentiated instruction.
Flex Classrooms will be located on different levels.
Flex Classrooms will provide general instruction space and be outfitted with AV equipment to allow for hybrid/blended learning.
Classrooms will be interdisciplinary and non-department specific.
At least one Classroom per Learning Community will be designed to facilitate vertical learning with dry-erase, writeable surfaces on all sides. Glazing may serve as a writing surface.
Classrooms will have whiteboard surfaces as outlined on two or more walls.

Adjacencies:

All Classrooms will have Direct Visual Connections to the main corridor(s) and flex spaces / break out spaces that are adjacent to the classrooms.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xL-1a; counter length to be 630mm.
Equipment Provided By School District:		Supply 1 Wireless Access Point – Installation by Design Builder
Equipment Provided By Design Builder:		Provide 1 305mm counter under t.v., 2x 2445x1225 W.B., Provide 1 wall mounted t.v. 1 Wireless Access Point Installation
Furniture		

Provided by School District:	**Provide 1 teaching station, 15 tables, 30 chairs**				
Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**	- -	**32** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average**
Electrical / Power	**N/A** -	**10** Min. Receptacles		**N/A** -	**N/A**
Aux. Systems / Communications – Security	**5** Min. Data Outlet	**1@2 data/WAP**	Wall mounted telephone	**- PA SPKR** -	**- TV** Speakers -
General Activity	General classroom				
Electrical / Power Notes	• Provide receptacles for general use.				
Aux. Systems Communications – Security Notes	• PA speaker • Wall mounted telephone at room entrance. • TV and ceiling presentation speakers. • Document camera. • Controls for AV in teacher station.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel.				

	• Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
22.00 – LEARNING COMMUNITIES (CLASSROOMS)	**22.19 – GENERAL INSTRUCTION (Minimum 80m²)**

Overview:

Classrooms will be arranged as modules of 30 students each with supporting spaces for each module. These modules, referred to as Learning Communities, will allow for stronger student-instructor relationships and to support social bubbles
The Learning Communities will each be unique to allow for differentiated instruction.
Flex Classrooms will be located on different levels.
Flex Classrooms will provide general instruction space and be outfitted with AV equipment to allow for hybrid/blended learning.
Classrooms will be interdisciplinary and non-department specific.
At least one Classroom per Learning Community will be designed to facilitate vertical learning with dry-erase, writeable surfaces on all sides. Glazing may serve as a writing surface.
Classrooms will have whiteboard surfaces as outlined on two or more walls.
Provide full width operable wall between adjacent classrooms so that each classroom can be combined for team teaching with a minimum of 1 other classroom. Prioritize combining differentiated classrooms within Learning Communities over combining identical classrooms.

Adjacencies:

All Classrooms will have Direct Visual Connections to the main corridor(s) and flex spaces / break out spaces that are adjacent to the classrooms.
One classroom will be able to be combined with adjacent Classroom by way of an operable wall partition.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xL-1a; counter length to be 630mm.
Equipment Provided By School District:		Supply 1 Wireless Access Point – Installation by Design Builder
Equipment		

Provided By Design Builder:	**Provide 1 305mm counter under t.v., 2x 2445x1225 W.B., P Provide 1 wall mounted t.v. 1 Wireless Access Point Installation**				
Furniture Provided by School District:	**Provide 1 teaching station, 15 tables, 30 chairs**				
Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)**	- -	**32** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average**
Electrical / Power	**N/A** -	**10** Min. Receptacles		**N/A** -	**N/A**
Aux. Systems / Communications – Security	**5** Min. Data Outlet	**1@2 data/WAP**	Wall mounted telephone	**- PA SPKR**	**- TV Speakers** -
General Activity	General classroom				
Electrical / Power Notes	• Provide receptacles for general use.				
Aux. Systems Communications – Security Notes	• PA speaker • Wall mounted telephone at room entrance. • TV and ceiling presentation speakers. • Document camera. • Controls for AV in teacher station.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls				

	• Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. • Provide top hung operable wall between adjacent general instruction rooms • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
22.00 – LEARNING COMMUNITIES (CLASSROOMS)	**22.20 – GENERAL INSTRUCTION (Minimum 80m²)**

Overview:

Classrooms will be arranged as modules of 30 students each with supporting spaces for each module. These modules, referred to as Learning Communities, will allow for stronger student-instructor relationships and to support social bubbles
The Learning Communities will each be unique to allow for differentiated instruction.
Flex Classrooms will be located on different levels.
Flex Classrooms will provide general instruction space and be outfitted with AV equipment to allow for hybrid/blended learning.
Classrooms will be interdisciplinary and non-department specific.
At least one Classroom per Learning Community will be designed to facilitate vertical learning with dry-erase, writeable surfaces on all sides. Glazing may serve as a writing surface.
Classrooms will have whiteboard surfaces as outlined on two or more walls.
Provide full width operable wall between adjacent classrooms so that each classroom can be combined for team teaching with a minimum of 1 other classroom. Prioritize combining differentiated classrooms within Learning Communities over combining identical classrooms.

Adjacencies:

All Classrooms will have Direct Visual Connections to the main corridor(s) and flex spaces / break out spaces that are adjacent to the classrooms.
One classroom will be able to be combined with adjacent Classroom by way of an operable wall partition.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xL-1a; counter length to be 630mm.
Equipment Provided By School District:		Supply 1 Wireless Access Point – Installation by Design Builder
Equipment Provided By Design Builder:		Provide 1 305mm counter under t.v., 2x 2445x1225 W.B., Provide 1 wall mounted t.v. 1 Wireless Access Point Installation

Furniture Provided by School District:	**Provide 1 teaching station, 15 tables, 30 chairs**				
Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration** **- High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC** **- Wall mount room temperature sensor with user interface** **- Wall mount CO2 sensor for demand control ventilation** **- Positive pressurization** **- Acoustically lined ducted transfer air (non-ceiling plenum)**	- -	**32** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average**
Electrical / Power	**N/A** -	**10** Min. Receptacles		**N/A** -	**N/A**
Aux. Systems / Communications – Security	**5** Min. Data Outlet	1@2 data/WAP	Wall mounted telephone	**- PA SPKR** -	**- TV** Speakers -
General Activity	General classroom				
Electrical / Power Notes	• Provide receptacles for general use.				
Aux. Systems Communications – Security Notes	• PA speaker • Wall mounted telephone at room entrance. • TV and ceiling presentation speakers. • Document camera. • Controls for AV in teacher station.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space				

	• Provide Wood Door with Steel Frame and vision panel. • Provide top hung operable wall between adjacent general instruction rooms • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
22.00 – LEARNING COMMUNITIES (CLASSROOMS)	**22.21 – GENERAL INSTRUCTION (Minimum 80m²)**

Overview:

Classrooms will be arranged as modules of 30 students each with supporting spaces for each module. These modules, referred to as Learning Communities, will allow for stronger student-instructor relationships and to support social bubbles
The Learning Communities will each be unique to allow for differentiated instruction.
Flex Classrooms will be located on different levels.
Flex Classrooms will provide general instruction space and be outfitted with AV equipment to allow for hybrid/blended learning.
Classrooms will be interdisciplinary and non-department specific.
At least one Classroom per Learning Community will be designed to facilitate vertical learning with dry-erase, writeable surfaces on all sides. Glazing may serve as a writing surface.
Classrooms will have whiteboard surfaces as outlined on two or more walls.
Provide full width operable wall between adjacent classrooms so that each classroom can be combined for team teaching with a minimum of 1 other classroom. Prioritize combining differentiated classrooms within Learning Communities over combining identical classrooms.

Adjacencies:

All Classrooms will have Direct Visual Connections to the main corridor(s) and flex spaces / break out spaces that are adjacent to the classrooms.
One classroom will be able to be combined with adjacent Classroom by way of an operable wall partition.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum		3050mm
Millwork		1xL-1a; counter length to be 630mm.
Equipment Provided By School District:		Supply 1 Wireless Access Point – Installation by Design Builder
Equipment		

Provided By Design Builder:	**Provide 1 305mm counter under t.v., 2x 2445x1225 W.B., Provide 1 wall mounted t.v. 1 Wireless Access Point Installation**				
Furniture Provided by School District:	**Provide 1 teaching station, 15 tables, 30 chairs**				
Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	**- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1.24 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)**	- -	**32** Occupant Load	**No** Special Exhaust	**- Light hazard occupancy fire protection**
Lighting	**Architectural 2x2 Recessed**	**Occupancy Sensor** Wall Pods Dimming	**N/A**	**50 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A** -	**10** Min. Receptacles		**N/A** -	**N/A**
Aux. Systems / Communications – Security	**5** Min. Data Outlet	**1@2 data/WAP**	**Wall mounted telephone**	**- PA SPKR** -	**- TV Speakers** -
General Activity	General classroom				
Electrical / Power Notes	• Provide receptacles for general use.				
Aux. Systems Communications – Security Notes	• PA speaker • Wall mounted telephone at room entrance. • TV and ceiling presentation speakers. • Document camera. • Controls for AV in teacher station.				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls				

	• Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Wood Door with Steel Frame and vision panel. • Provide top hung operable wall between adjacent general instruction rooms • Provide corner guards at all exterior corners of interior walls

23.00 Mechanical / Electrical Service Space

Functional Area	Functional Unit
23.00 – MECHANICAL / ELECTRICAL SERVICE SPACE	**23.01 - MECHANICAL (Minimum 113m²)**

Overview:

The Mechanical / Electrical Service Space will be the 5% of overall GFA allocated under Ministry of Education's Design Aid Sheet guidelines for building gross areas required for the School.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring				
	Base	Epoxy Cove Base				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		FD-1 - Refer to Plumbing Fixture Schedules	HD-1 - Refer to Plumbing Fixture Schedules	- -	- -	- -
Mechanical		-	- Exposed ductwork	N/A Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		Lensed LED Striplight	Occupancy Sensor Wall Pods	Emergency Lighting	50 fc -	-0.4 min/average -
Electrical / Power		Panels	6 Min. Receptacles	Irrigation Control - DDC Panels	-	-
Aux. Systems / Communications – Security		2 Min. Data Outlets Outlets for DDC panels	1@2 data/WAP		- PA SPKR -	- -
General Activity		Mechanical or electrical services room				
Electrical / Power Notes		• Provide panels for mechanical equipment and adjacent lighting and receptacle circuits. • Provide power to all mechanical equipment including disconnects, VFDs, reactors etc.				

	• Provide power for all auxiliary equipment by other trades. • Provide lighting layout coordinated with ductwork and other equipment.
Aux. Systems Communications – Security Notes	• Provide outlets for DDC panels as required. • Provide outlets for auxiliary equipment by other trades. • PA speaker(s)
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide 2 Steel Doors with Steel Frames. • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
23.00 – MECHANICAL / ELECTRICAL SERVICE SPACE	**23.02 - MECHANICAL (Minimum 55m²)**

Overview:

The Mechanical / Electrical Service Space will be the 5% of overall GFA allocated under Ministry of Education's Design Aid Sheet guidelines for building gross areas required for the School.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring
	Base	Epoxy Cove Base
	Walls	Painted Gypsum Board
	Ceiling	Exposed Structure Above
Ceiling Height Minimum		Exposed Structure Above
Millwork		
Equipment Provided By School District:		
Equipment Provided By Design Builder:		
Furniture Provided by School District:		

Plumbing / Gas	FD-1 - Refer to Plumbing Fixture Schedules	HD-1 - Refer to Plumbing Fixture Schedules	- -	- -	- -
Mechanical	-	- Exposed ductwork	N/A Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting	Lensed LED Striplight	Occupancy Sensor Wall Pods	Emergency Lighting	30 fc	-0.4 min/average -
Electrical / Power	Panel	6 Min. Receptacles	N/A -	N/A -	N/A -
Aux. Systems / Communications – Security	0 Min. Data Outlets			- -	- -

General Activity	Mechanical or electrical services room
Electrical / Power Notes	• Provide power to all mechanical equipment. • Provide power for all auxiliary equipment by other trades.
Aux. Systems Communications – Security Notes	• Provide data outlets for DDC panels as required.
Special Requirements	• Acoustic separations between adjacent rooms

	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide Steel Door with Steel Frame. • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
23.00 – MECHANICAL / ELECTRICAL SERVICE SPACE	**23.03 - ELECTRICAL (Minimum 50m²)**

Overview:

The Mechanical / Electrical Service Space will be the 5% of overall GFA allocated under Ministry of Education's Design Aid Sheet guidelines for building gross areas required for the School.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Paint Sealer				
	Base	Epoxy Flash Cove				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide 1 exterior double door				
Furniture Provided by School District:						
Plumbing / Gas		HD-1 - Refer to Plumbing Fixture Schedules	- -	- -	- -	- -
Mechanical		- 2 @ heavy duty, hydronic, fan assisted air conditioner, condensate to nearest drain, 10 kW heating/6.6 kW cooling combination - Wall mount, vandal proof, temperature sensor (Non-adjustable)	- -	N/A Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		- Lensed LED Strip Lights	Occupancy Sensor Wall Pods	Emergency Lighting	30 fc	-0.4 min/average
Electrical / Power		Service entry distribution equipment Utility meter Transformers Distribution Centers Panels	6 Min. Receptacles	-	HVAC cooling equipment	

Aux. Systems / Communications – Security	Outlets as required	1@2 data/WAP		- PA rack and head end equipment PA SPKR -	- -
General Activity	Mechanical or electrical services room				
Electrical / Power Notes	• Main electrical room including utility service entrance • All floor mounted equipment shall be installed on 100mm house keeping pads • Provide power to communications terminal board and network racks as required • Ensure 2400mm of clear wall space for future equipment				
Aux. Systems Communications – Security Notes	• PA standing rack • Security/Access control rack • Network rack • Provide min 1000mm access to both front and back of each rack				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide Steel Door with Steel Frame.				

Functional Area	Functional Unit
23.00 – MECHANICAL / ELECTRICAL SERVICE SPACE	**23.04 – MECH. (Minimum 37m²)**

Overview:

The Mechanical / Electrical Service Space will be the 5% of overall GFA allocated under Ministry of Education's Design Aid Sheet guidelines for building gross areas required for the School.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring
	Base	Epoxy Cove Base
	Walls	Painted Gypsum Board
	Ceiling	Exposed Structure Above
Ceiling Height Minimum		Exposed Structure Above
Millwork		
Equipment Provided By School District:		
Equipment Provided By Design Builder:		
Furniture Provided by School District:		

Plumbing / Gas	FD-1 - Refer to Plumbing Fixture Schedules	HD-1 - Refer to Plumbing Fixture Schedules	- -	- -	- -
Mechanical	-	- -	N/A Occupant Load	No Special Exhaust	- -
Lighting	Lensed striplights	Occupancy Sensor Wall Pods	Emergency Lighting	30 fc -	-0.4 min/average -
Electrical / Power	Panel 2mnw	2 Min. Receptacles	Mechanical equipment	-	N/A
Aux. Systems / Communications – Security	0 Min. Data Outlets			- -	- -

General Activity	Mechanical or electrical services room
Electrical / Power Notes	• Panel • Provide connection to all mechanical equipment
Aux. Systems Communications – Security Notes	• Provide data outlets for DDC panels as required
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls

	• Provide acoustic caulk under all interior wall bottom plates • Provide Steel Door with Steel Frame.

Functional Area	Functional Unit
23.00 – MECHANICAL / ELECTRICAL SERVICE SPACE	**23.05 – COMM. (Minimum 13m²)**

Overview:

The Mechanical / Electrical Service Space will be the 5% of overall GFA allocated under Ministry of Education's Design Aid Sheet guidelines for building gross areas required for the School.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		HD-1 - Refer to Plumbing Fixture Schedules	- -	- -	- -	- -
Mechanical		- 2 @ heavy duty, hydronic, fan assisted air conditioner, condensate to nearest drain, 5 kW cooling - Wall mount, vandal proof, temperature sensor (Non-adjustable) - 2 @ DX fan coil air conditioner, condensate to nearest drain, 8 kW cooling - Wall mount, vandal proof, controller	- -	N/A Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		Lensed striplights	Occupancy Sensor Wall Pods	Emergency Lighting 1 Exit	30 fc	-0.4 min/average -
Electrical / Power		Panel	6 Min. Receptacles	Network/PA/Security racks	-	

Aux. Systems / Communications – Security	0 Min. Data Outlets			- -	- -
General Activity	Mechanical or electrical services room				
Electrical / Power Notes	• Provide general use receptacles • Panel • Provide power to network/PA/security racks • Provide power to auxiliary equipment as required				
Aux. Systems Communications – Security Notes	• Provide four post floor mounted racks – ensure 1000mm clearance at the front and back of each rack for maintenance				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide Steel Door with Steel Frame.				

Functional Area	Functional Unit
23.00 – MECHANICAL / ELECTRICAL SERVICE SPACE	**23.06 – MECH. (Minimum 35m²)**

Overview:

The Mechanical / Electrical Service Space will be the 5% of overall GFA allocated under Ministry of Education's Design Aid Sheet guidelines for building gross areas required for the School.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring				
	Base	Epoxy Cove Base				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		FD-1 - Refer to Plumbing Fixture Schedules	HD-1 - Refer to Plumbing Fixture Schedules	- -	- -	- -
Mechanical		-	- -	N/A Occupant Load	No Special Exhaust	- -
Lighting		Lensed striplights	Occupancy Sensor Wall Pods	Emergency Lighting	30 fc -	-0.4 min/average -
Electrical / Power		Panel	2 Min. Receptacles	Mechanical equipment	N/A -	N/A
Aux. Systems / Communications – Security		0 Min. Data Outlets			- -	- -
General Activity		Mechanical or electrical services room				
Electrical / Power Notes		• Panel • Provide connection to all mechanical equipment				
Aux. Systems Communications – Security Notes		• Provide data outlets for DDC panels as required				
Special Requirements		• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls				

	• Provide acoustic caulk under all interior wall bottom plates • Provide Steel Door with Steel Frame.

Functional Area	Functional Unit
23.00 – MECHANICAL / ELECTRICAL SERVICE SPACE	**23.07 – MECH. (Minimum 35m²)**

Overview:

The Mechanical / Electrical Service Space will be the 5% of overall GFA allocated under Ministry of Education's Design Aid Sheet guidelines for building gross areas required for the School.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring				
	Base	Epoxy Cove Base				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		FD-1 - Refer to Plumbing Fixture Schedules	HD-1 - Refer to Plumbing Fixture Schedules	- -	- -	- -
Mechanical		-	- -	N/A Occupant Load	No Special Exhaust	- -
Lighting		- Lensed striplights	Occupancy Sensor Wall Pods	Emergency Lighting	30 fc -	-0.4 min/average -
Electrical / Power		Panel -	2 Min. Receptacles		-	
Aux. Systems / Communications – Security		0 Min. Data Outlet			- -	- -
General Activity		Mechanical or electrical services room				
Electrical / Power Notes		• Panel • Provide connection to all mechanical equipment				
Aux. Systems Communications – Security Notes		• Provide data outlets for DDC panels as required				
Special Requirements		• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls				

	• Provide acoustic caulk under all interior wall bottom plates • Provide Steel Door with Steel Frame. • Provide Steel Door with Steel Frame.

Functional Area	Functional Unit
23.00 – MECHANICAL / ELECTRICAL SERVICE SPACE	**23.08 – MECH. (Minimum 32m²)**

Overview:

The Mechanical / Electrical Service Space will be the 5% of overall GFA allocated under Ministry of Education's Design Aid Sheet guidelines for building gross areas required for the School.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring			
	Base	Epoxy Cove Base			
	Walls	Painted Gypsum Board			
	Ceiling	Exposed Structure Above			
Ceiling Height Minimum		Exposed Structure Above			
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:					
Furniture Provided by School District:					
Plumbing / Gas		FD-1 - Refer to Plumbing Fixture Schedules	HD-1 - Refer to Plumbing Fixture Schedules	- -	- -	- -
Mechanical		- 2 @ heavy duty, hydronic, fan assisted air conditioner, condensate to nearest drain, 5 kW cooling - Wall mount, vandal proof, temperature sensor (Non-adjustable)	- -	N/A Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		- Lensed striplights	Occupancy Sensor Wall Pods	Emergency Lighting	50 fc -30 fc	-0.4 min/average -
Electrical / Power		Panels	8 Min. Receptacles			
Aux. Systems / Communications – Security		0 Min. Data Outlet			- -	- -
General Activity		Mechanical or electrical services room				
Electrical / Power Notes		• Provide general use receptacles • Panel				

	• Provide power to network/PA/security racks • Provide power to auxiliary equipment as required
Aux. Systems Communications – Security Notes	• Provide four post floor mounted racks – ensure 1000mm clearance at the front and back of each rack for maintenance • Provide data outlets for DDC panels as required
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide Steel Door with Steel Frame.

Functional Area	Functional Unit
23.00 – MECHANICAL / ELECTRICAL SERVICE SPACE	**23.09 – MECH. (Minimum 32m²)**

Overview:

The Mechanical / Electrical Service Space will be the 5% of overall GFA allocated under Ministry of Education's Design Aid Sheet guidelines for building gross areas required for the School.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring				
	Base	Epoxy Cove Base				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		FD-1 - Refer to Plumbing Fixture Schedules	HD-1 - Refer to Plumbing Fixture Schedules	- -	- -	- -
Mechanical		-	- -	N/A Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		- Lensed striplights	Occupancy Sensor Wall Pods	Emergency Lighting	30 fc -	-0.4 min/average -
Electrical / Power		Panel	2 Min. Receptacles		-	
Aux. Systems / Communications – Security		0 Min. Data Outlet			- -	- -
General Activity		Mechanical or electrical services room				
Electrical / Power Notes		• Panel • Provide connection to all mechanical equipment				
Aux. Systems Communications – Security Notes		• Provide data outlets for DDC panels as required				
Special Requirements		• Acoustic separations between adjacent rooms				

	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide Steel Door with Steel Frame.

Functional Area	Functional Unit
23.00 – MECHANICAL / ELECTRICAL SERVICE SPACE	**23.10 – MECH. (Minimum 35m²)**

Overview:

The Mechanical / Electrical Service Space will be the 5% of overall GFA allocated under Ministry of Education's Design Aid Sheet guidelines for building gross areas required for the School.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring				
	Base	Epoxy Cove Base				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		FD-1 - Refer to Plumbing Fixture Schedules	HD-1 - Refer to Plumbing Fixture Schedules	- -	- -	- -
Mechanical		-	- -	N/A Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		- Lensed striplights	Occupancy Sensor Wall Pods	Emergency Lighting	30 fc	-0.4 min/average -
Electrical / Power		Panels	2 Min. Receptacles		-	
Aux. Systems / Communications – Security		0 Min. Data Outlet			- -	- -
General Activity		Mechanical or electrical services room				
Electrical / Power Notes		• Panel • Provide connection to all mechanical equipment				
Aux. Systems Communications – Security Notes		• Provide data outlets for DDC panels as required				
Special Requirements		• Acoustic separations between adjacent rooms				

	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide Steel Door with Steel Frame.

Functional Area	Functional Unit
23.00 – MECHANICAL / ELECTRICAL SERVICE SPACE	**23.11 – MECH. (Minimum 35m²)**

Overview:

The Mechanical / Electrical Service Space will be the 5% of overall GFA allocated under Ministry of Education's Design Aid Sheet guidelines for building gross areas required for the School.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring				
	Base	Epoxy Cove Base				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		FD-1 - Refer to Plumbing Fixture Schedules	HD-1 - Refer to Plumbing Fixture Schedules	- -	- -	- -
Mechanical		-	- -	N/A Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		Lensed striplights	Occupancy Sensor Wall Pods	Emergency Lighting	30 fc -	-0.4 min/average -
Electrical / Power		Panel	2 Min. Receptacles			
Aux. Systems / Communications – Security		0 Min. Data Outlets			- -	- -
General Activity		Mechanical or electrical services room				
Electrical / Power Notes		• Panel • Provide connection to all mechanical equipment				
Aux. Systems Communications – Security Notes		• Provide data outlets for DDC panels as required				
Special Requirements		• Acoustic separations between adjacent rooms				

	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide Steel Door with Steel Frame.

Functional Area	Functional Unit
23.00 – MECHANICAL / ELECTRICAL SERVICE SPACE	**23.12 – MECH. (Minimum 34m²)**

Overview:

The Mechanical / Electrical Service Space will be the 5% of overall GFA allocated under Ministry of Education's Design Aid Sheet guidelines for building gross areas required for the School.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring				
	Base	Epoxy Cove Base				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		FD-1 - Refer to Plumbing Fixture Schedules	HD-1 - Refer to Plumbing Fixture Schedules	- -	- -	- -
Mechanical		- 2 @ heavy duty, hydronic, fan assisted air conditioner, condensate to nearest drain, 5 kW cooling - Wall mount, vandal proof, temperature sensor (Non-adjustable)	- -	N/A Occupant Load	No Special Exhaust	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		Lensed striplights	Occupancy Sensor Wall Pods	Emergency Lighting	30 fc -	-0.4 min/average -
Electrical / Power		Emergency Lighting Inverter Panel 3SW Panel 3MSW	2 Min. Receptacles	N/A	N/A	N/A
Aux. Systems / Communications – Security		0 Min. Data Outlets			- -	- -
General Activity		Mechanical or electrical services room				

Electrical / Power Notes	• Panels • Provide connection to all mechanical equipment
Aux. Systems Communications – Security Notes	• Provide data outlets for DDC panels as required
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide Steel Door with Steel Frame.

24.00 Design Space

Functional Area		Functional Unit				
24.00 – DESIGN SPACE		**24.02 – CORRIDOR (Minimum 82m²)**				
Overview: A centralized corridor is to be provided in order to access all classrooms, community areas, vertical access, ect. **Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.**						
Adjacencies: Refer to adjacency diagram.						
Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide 48 double lockers with sloping top				
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Heavy duty, hydronic, fan assisted heater, 3.2 kW heating - Wall mount, vandal proof, temperature sensor (Non-adjustable)	**- Mechanical condensation resistance on clearstory window**	N/A Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		Architectural feature lighting -	Dimming	Emergency Lighting 1 Exit	30 fc	-0.4 min/average -
Electrical / Power		N/A	Receptacles	N/A -	N/A -	-
Aux. Systems / Communications – Security			2 data/WAP		- PA SPKRS -	-
General Activity		Staff Room Access Hallway				
Electrical / Power Notes		• Provide general maintenance receptacles in all corridors - minimum 5m from corridor ends and maximum 12m intervals throughout • Provide architectural lighting suited to ceiling design and finishes. Lighting in long corridors shall create visual breaks in the ceiling and vary in shape/size/type				

Aux. Systems Communications – Security Notes	• Provide WAPs in corridors maximum 15m apart. • Provide PA speakers maximum 25 m apart
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide Aluminum Curtain Wall Doors and Glazing. • Provide corner guards at all exterior corners of interior walls •

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.03 – CORRIDOR (Minimum 301m²)**

Overview: A centralized corridor is to be provided in order to access all classrooms, community areas, vertical access, ect.
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	T-Bar (1220mm x 610mm) / Suspended Acoustic Wood Panels or equivalent features coordinated to Design Builder's Architectural design			
Ceiling Height Minimum		3050mm			
Millwork		2xM-6			
Equipment Provided By School District:					
Equipment Provided By Design Builder:		Provide 39 double lockers with sloping top, 72 single half height lockers with sloping top			
Furniture Provided by School District:					
Plumbing / Gas		-	-	-	-
Mechanical		-	-	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		Architectural feature lighting	Dimming	Emergency Lighting 1 Exit	30 fc	-0.4 min/average
Electrical / Power		N/A	Receptacles	N/A -	N/A -	- N/A
Aux. Systems / Communications – Security			2 data/WAP		- PA SPKRS -	-
General Activity		Main access corridor				
Electrical / Power Notes		• Provide general maintenance receptacles in all corridors – minimum 5m from corridor ends and maximum 12m intervals throughout • Provide architectural lighting suited to ceiling design and finishes. Lighting in long corridors shall create visual breaks in the ceiling and vary in shape/size/type				
Aux. Systems Communications –		• Provide WAPs in corridors maximum 15m apart. • Provide PA speakers maximum 25 m apart				

Security Notes	
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.04 – ACCESS (Minimum 18m²)**

Overview: A centralized corridor is to be provided in order to access all classrooms, community areas, vertical access, ect.
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	T-Bar (1220mm x 610mm)			
Ceiling Height Minimum		3050mm			
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:					
Furniture Provided by School District:					
Plumbing / Gas		- -	- -	- -	- -	- -
Mechanical		-	- -	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		2x2 Recessed luminaire	Occupancy sensor	Emergency Lighting	30 fc -	-0.4 min/average -
Electrical / Power		N/A	1 Min. Receptacles	N/A -	N/A -	-
Aux. Systems / Communications – Security		0 Min. Data Outlets			- PA SPKR -	- -
General Activity		Access corridor				
Electrical / Power Notes		• Provide general use receptacle				
Aux. Systems Communications – Security Notes		• PA speaker				
Special Requirements		• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space				

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.05 – STAFF WC (Minimum 7m²)**

Overview: A washroom dedicated to staff members only.
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring
	Base	Epoxy Flash Cove
	Walls	Wall Tiles With Painted Gypsum Board Above
	Ceiling	Gypsum Board Drop Ceiling – Painted
Ceiling Height Minimum		2450mm
Millwork		
Equipment Provided By School District:		
Equipment Provided By Design Builder:		Provide 1 toilet paper holder, 1 sani disp. 1 soap disp, 1 electric hand dryer, 1 H/C accessible sink, 1 H/C accessible tilt mirror, 1 H/C accessible corner grab bar set, 1 coat hanger on back of door, 1 wall mounted waste receptacle
Furniture Provided by School District:		

Plumbing / Gas	WC-1 - Refer to Plumbing Fixture Schedules	LV-4 - Refer to Plumbing Fixture Schedules	FD-1 - Refer to Plumbing Fixture Schedules	- -	- -
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- -	n/a Occupant Load	- 35 l/s to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting	Vanity Wall Sconce Recessed down light	Occupancy Sensor Wall Pods	N/A	30 fc -	- -
Electrical / Power	N/A	1 Min. Receptacles	N/A -	N/A -	N/A
Aux. Systems / Communications – Security	0 Min. Data Outlets	0 Min. Tel. Outlets	0 Min Cable Outlets	- PA SPKR -	- -

General Activity	Staff washroom
Electrical / Power Notes	• Provide power to all required washroom fixtures.
Aux. Systems	• PA speaker

Communications – Security Notes	
Special Requirements	• Acoustic separations between adjacent rooms • Exhaust from this room • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide backing as required for all equipment • Slope floors to drain in all WC

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.06 – CUSTODIAL (Minimum 59m²)**

Overview: A dedicated lockable room that contains a mop sink, storage shelving and room to store a 26" x 66" custodial scrubber when not in use.
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring			
	Base	Epoxy Flash Cove			
	Walls	Wall Tiles With Painted Gypsum Board Above			
	Ceiling	Exposed Structure Above			
Ceiling Height Minimum		Exposed Structure Above			
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:		Wall mount shelving			
Furniture Provided by School District:					
Plumbing / Gas		CS-1 - Refer to Plumbing Fixture Schedules	TP-1 - Refer to Plumbing Fixture Schedules	FD-1 - Refer to Plumbing Fixture Schedules	- -	- -
Mechanical		- Heavy duty, hydronic, fan assisted air conditioner, 3.2 kW heating - Wall mount, vandal proof, temperature sensor (Non-adjustable) - Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- Exposed ductwork	n/a Occupant Load	- 270 l/s to constant volume exhaust energy recovery system	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		Lensed Strip lights	Occupancy Sensor Wall Pods	Emergency Lighting	30 fc--	- -
Electrical / Power		N/A	4 Min. Receptacles	-	N/A -	N/A-
Aux. Systems / Communications – Security		0 Min. Data Outlets	N/A	N/A	- PA SPKR W/Vol. Control -	- -
General Activity		Custodial room				

Electrical / Power Notes	• Provide power as required for custodial including receptacles for charging motorized portable equipment. • Provide receptacles for general use.
Aux. Systems Communications – Security Notes	• PA speaker
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Slope floor to drain • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.07 – WASHROOMS (Minimum 64m²)**

Overview: A public washroom that can be accessed by either Staff, Students and / or visitors.
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring
	Base	Epoxy Flash Cove
	Walls	Wall Tiles With Painted Gypsum Board Above
	Ceiling	Gypsum Board Drop Ceiling – Painted
Ceiling Height Minimum		2450mm In Each Stall, 3050mm In Sink Area
Millwork		
Equipment Provided By School District:		
Equipment Provided By Design Builder:		2 H/C Accessible Stalls: Provide 2 toilet paper holders, 2 sani disp. 2 soap disp, 2 electric hand dryers, 2 H/C accessible sinks, 2 H/C accessible tilt mirrors, 2 H/C accessible corner grab bar sets, 2 coat hangers on back of doors, 2 flush valve toilets, 2 floor drains 5 Gender Neutral Stalls: 5 toilet paper holders, 5 sani disp. 5 flush valve toilets, 5 floor drains Sink Area: 2 floor drains min., 2 3-station sinks, 3 electric hand dryers, 4 soap dispensers, 6 mirrors (one above each sink station), 2 wall mounted waste receptacle Provide full height wall separations between stalls
Furniture Provided by School District:		

Plumbing / Gas	WC-1 @ 7 - Refer to Plumbing Fixture Schedules	LV-3 @ 2 - Refer to Plumbing Fixture Schedules	FD-1 @ 9 - Refer to Plumbing Fixture Schedules	LV-4 @ 2 - Refer to Plumbing Fixture Schedules	- -
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- -	n/a Occupant Load	- 7 @ 35 l/s local exhaust to constant volume exhaust energy recovery system - 765 l/s general exhaust to variable volume exhaust energy recovery system	- Light hazard occupancy fire protection

Lighting	**Vanity Wall Sconces** Recessed down lights	**Occupancy Sensor** Wall Pods	Emergency lights	**30 fc** -	**-0.6 min/average** -
Electrical / Power	**N/A**	**2** Min. Receptacles	**N/A**	**2 Electric Hand Dryer** **4 Sink Sensors** -	**1 Speaker** -
Aux. Systems / Communications – Security	**0** Min. Data Outlets	**0** Min. Tel. Outlets	**0** Min Cable Outlets	**- PA SPKR**	**- N/A**
General Activity	Staff washroom				
Electrical / Power Notes	• Provide power to all required washroom fixtures. • Provide individual occupancy sensor control in each stall				
Aux. Systems Communications – Security Notes	• PA speaker				
Special Requirements	• Acoustic separations between adjacent rooms • Exhaust from this room • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide backing as required for all equipment • Slope floors to drain in all WC				

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.08 – CORRIDOR (Minimum 198m²)**

Overview: A centralized corridor is to be provided in order to access all classrooms, community areas, vertical access, etc..
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm) / Suspended Acoustic Wood Panels or equivalent features coordinated to Design Builder's Architectural design				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide 50 double lockers with sloping top				
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Heavy duty, hydronic, fan assisted air conditioner, 3.2 kW heating - Wall mount, vandal proof, temperature sensor (Non-adjustable)	-	N/A Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		- Architectural feature lighting	- Dimming	Emergency Light	-30 fc	-0.4 min/average
Electrical / Power		-	Receptacles	- N/A	- N/A	-
Aux. Systems / Communications – Security		-	-2 data/WAP	-	- PA SPKRS	-
General Activity		Main access corridor				
Electrical / Power Notes		• Provide general maintenance receptacles in all corridors – minimum 5m from corridor ends and maximum 12m intervals throughout				

	• Provide architectural lighting suited to ceiling design and finishes. Lighting in long corridors shall create visual breaks in the ceiling and vary in shape/size/type
Aux. Systems Communications – Security Notes	• Provide WAPs in corridors maximum 15m apart. • Provide PA speakers maximum 25 m apart
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.09 – CORRIDOR (Minimum 40m²)**

Overview: A centralized corridor is to be provided in order to access all classrooms, community areas, vertical access, etc..
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	T-Bar (1220mm x 610mm)			
Ceiling Height Minimum		3050mm			
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:					
Furniture Provided by School District:					
Plumbing / Gas		-	-	-	-	-
Mechanical		-	-	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		Architectural feature lighting	Dimming	Emergency lighting	30 fc -	-0.4 min/average
Electrical / Power		N/A	Receptacles	N/A -	N/A -	1 Speaker -
Aux. Systems / Communications – Security			2 data/WAP		- PA SPKRS -	- -
General Activity		Access corridor				
Electrical / Power Notes		• Provide general maintenance receptacles in all corridors – minimum 5m from corridor ends and maximum 12m intervals throughout • Provide architectural lighting suited to ceiling design and finishes. Lighting in long corridors shall create visual breaks in the ceiling and vary in shape/size/type				
Aux. Systems Communications – Security Notes		• Provide WAPs in corridors maximum 15m apart. • Provide PA speakers maximum 25 m apar				
Special Requirements		• Acoustic separations between adjacent rooms				

	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.10 – VEST (Minimum 13m²)**

Overview: A entry Vestibule is to be provided at selected entries. Vestibule sizing and dimensions to meet the latest BC Building Code and accessible Requirements.
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		- -	- -	- -	- -	- -
Mechanical		- Heavy duty, hydronic, fan assisted air conditioner, 3.2 kW heating - Wall mount, vandal proof, temperature sensor (Non-adjustable)	- -	N/A Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		Recessed luminaires	Diming Occupancy sensor	Emergency Lighting 1 Exit	30 fc	-0.4 min/average -
Electrical / Power			1 Min. Receptacles			-
Aux. Systems / Communications – Security					- -	- -
General Activity		Access corridor				
Electrical / Power Notes		• Provide general use receptacle.				
Aux. Systems Communications – Security Notes		•				
Special Requirements		• Acoustic separations between adjacent rooms				

	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.11 – ACCESS (Minimum 26m²)**

Overview: A centralized corridor is to be provided in order to access all classrooms, community areas, vertical access, etc..
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	T-Bar or Gypsum Board ceiling			
Ceiling Height Minimum		Second Floor Level			
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:					
Furniture Provided by School District:					
Plumbing / Gas		-	-	-	-	-
		-	-	-	-	-
Mechanical		- Heavy duty, hydronic, fan assisted air conditioner, 3.2 kW heating - Wall mount, vandal proof, temperature sensor (Non-adjustable)	-	N/A Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		Architectural Recessed	Occupancy sensor	Emergency Lighting	30 fc	-
						-
Electrical / Power			1 Min. Receptacles	-		
Aux. Systems / Communications – Security					- PA SPKR -	-
						-
General Activity		Access corridor				
Electrical / Power Notes		• Provide general use receptacle				
Aux. Systems Communications – Security Notes		• PA speaker				
Special Requirements		• Acoustic separations between adjacent rooms				

	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.12 – CORRIDOR (Minimum 131m²)**

Overview: A centralized corridor is to be provided in order to access all classrooms, community areas, vertical access, etc..
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	Suspended Acoustic Wood Panels With Linear Wood Slat Feature or equivalent features coordinated to Design Builder's Architectural design				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide 140 half height single lockers				
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation	-	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		- Architectural feature lighting	- Dimming	Emergency Light	-30 fc	-0.4 min/average
Electrical / Power		-	2 Min. Receptacles	- N/A	- N/A	- N/A

Aux. Systems / Communications – Security	- -	-2 data/WAP -	- -	- PA SPKRS -	- -
General Activity	Main access corridor				
Electrical / Power Notes	• Provide general maintenance receptacles in all corridors – minimum 5m from corridor ends and maximum 12m intervals throughout • Provide architectural lighting suited to ceiling design and finishes. Lighting in long corridors shall create visual breaks in the ceiling and vary in shape/size/type				
Aux. Systems Communications – Security Notes	• Provide WAPs in corridors maximum 15m apart. • Provide PA speakers maximum 25 m apart				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls				

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.13 – CORRIDOR (Minimum 74m²)**

Overview: A centralized corridor is to be provided in order to access all classrooms, community areas, vertical access, etc..
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		-	-	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		Architectural feature lighting	Dimming	Emergency Lighting	30 fc -	-0.4 min/average -
Electrical / Power		N/A	2 Min. Receptacles	N/A	N/A -	-
Aux. Systems / Communications – Security			2 data/WAP	N/A	- PA SPKRS -	- -
General Activity		Main access corridor				
Electrical / Power Notes		• Provide general maintenance receptacles in all corridors - minimum 5m from corridor ends and maximum 12m intervals throughout • Provide architectural lighting suited to ceiling design and finishes. Lighting in long corridors shall create visual breaks in the ceiling and vary in shape/size/type				
Aux. Systems Communications – Security Notes		• Provide WAPs in corridors maximum 15m apart. • Provide PA speakers maximum 25 m apart				
Special Requirements		• Acoustic separations between adjacent rooms				

	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.14 – ENTRY FOYER (Minimum 195m²)**

Overview: Upon following the main entry vestibule, the user will enter the Entry Foyer. This area is to be a unique space with upgraded finishes, building characteristics and possible vaulted ceilings.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board, Wood Columns
	Ceiling	Gypsum Board Drop Ceiling, Wood Beams – Painted, Circular Wood Slat Ceiling With Circular Lighting or equivalent features coordinated to Design Builder's Architectural design

Ceiling Height Minimum	3050mm				
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:					
Furniture Provided by School District:					
Plumbing / Gas	-	-	-	-	-
Mechanical	-	-	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting	- Feature and cove lighting -	- Dimming Daylight sensor -	Yes Emergency Light	-30 fc -	-0.4 min/average -
Electrical / Power	-	1 Min. Receptacles	-	-	-
Aux. Systems / Communications – Security	-	- N/A -	-	- PA speaker -	- TV -

General Activity	Main access corridor
Electrical / Power Notes	• Provide general use receptacles. • Door connections • Lighting shall express architectural ceiling features and provide unique entrance experience
Aux. Systems Communications – Security Notes	• TV media box for information display. • PA speaker
Special Requirements	• Acoustic separations between adjacent rooms

	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls • Provide full height and width aluminum curtainwall glazing.

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.15 – VESTIBULE (Minimum 37m²)**
Overview: A entry Vestibule is to be provided at selected entries. Vestibule sizing and dimensions to meet the latest BC Building Code and accessible Requirements.	
Adjacencies: Refer to adjacency diagram.	
Finishes – Floor	Resilient Flooring
Base	Rubber Base
Walls	Painted Gypsum Board
Ceiling	T-Bar (1220mm x 610mm)
Ceiling Height Minimum	3250mm
Millwork	
Equipment Provided By School District:	
Equipment Provided By Design Builder:	Provide 4 sliding glass entrance doors with panic exit swing capability
Furniture Provided by School District:	

Plumbing / Gas	-	-	-	-	-
	-	-	-	-	-
Mechanical	- 2 @ Heavy duty, hydronic, fan assisted air conditioner, 150w/m² heating - Wall mount, vandal proof, temperature sensor (Non-adjustable)	-	N/A Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
		-			
Lighting	- Architectural linear recessed	- Daylight sensor Dimming	Emergency Light	-30 fc	-0.4 min/average
		-		-	-
Electrical / Power	-	1	-	-	-
	-	Min. Receptacles	-	-	-
Aux. Systems / Communications – Security	-	- N/A	- N/A	- N/A	- N/A
	-	-	-	-	-

General Activity	Main entrance vestibule
Electrical / Power Notes	• Fire alarm annunciator (Edwards). • Security Panel/keypad • Maintenance receptacle. • Door connections
Aux. Systems Communications –	•

Security Notes	
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.16 – CORRIDOR (Minimum 124m²)**

Overview: A centralized corridor is to be provided in order to access all classrooms, community areas, vertical access, etc..
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		-	-	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		Architectural feature lighting	Dimming	Emergency Lighting	30 fc -	-0.4 min/average -
Electrical / Power		N/A -	3 Min. Receptacles	N/A	N/A -	N/A -
Aux. Systems / Communications – Security			2 data/WAP	0 Min. Cable Outlet	- PA SPKRS -	- -
General Activity		Main access corridor				
Electrical / Power Notes		• Provide general maintenance receptacles in all corridors - minimum 5m from corridor ends and maximum 12m intervals throughout • Provide architectural lighting suited to ceiling design and finishes. Lighting in long corridors shall create visual breaks in the ceiling and vary in shape/size/type				
Aux. Systems Communications – Security Notes		• Provide WAPs in corridors maximum 15m apart. • Provide PA speakers maximum 25 m apart				
Special Requirements		• Acoustic separations between adjacent rooms				

	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.17 – CORRIDOR (Minimum 131m²)**

Overview: A centralized corridor is to be provided in order to access all classrooms, community areas, vertical access, etc..
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	Suspended Acoustic Wood Panels With Linear Wood Slat Feature or equivalent features coordinated to Design Builder's Architectural design				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide 140 half height single lockers				
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation	-	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		- Architectural feature lighting	Dimming	Emergency Lighting	-30 fc	-0.4 min/average
Electrical / Power		-	2 Min. Receptacles	-	-	-

Aux. Systems / Communications – Security	- -	-2 data/WAP -	- -	- PA SPKRS -	- -
General Activity	Main access corridor				
Electrical / Power Notes	• Provide general maintenance receptacles in all corridors – minimum 5m from corridor ends and maximum 12m intervals throughout • Provide architectural lighting suited to ceiling design and finishes. Lighting in long corridors shall create visual breaks in the ceiling and vary in shape/size/type				
Aux. Systems Communications – Security Notes	• Provide WAPs in corridors maximum 15m apart. • Provide PA speakers maximum 25 m apart				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls				

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.18 – PREP. (Minimum 8m²)**

Overview: A lockable room dedicated to Teacher and Staff prep. Room to include photo copier and appropriate millwork for prep and storage of stationary items.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	T-Bar (1220mm x 610mm)			
Ceiling Height Minimum		3050mm			
Millwork		3xL-1a, 3xU-1; unit to be 2400mm in length.			
Equipment Provided By School District:		Provide 1 printer			
Equipment Provided By Design Builder:					
Furniture Provided by School District:					
Plumbing / Gas		- -	- -	- -	- -	- -
Mechanical		-	- -	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		Architectural 2x2 Recessed	Occupancy Sensor Wall Pods	Emergency lighting	30 fc -	-0.6 min/average -
Electrical / Power			4 Min. Receptacles	-	-	-
Aux. Systems / Communications – Security		2 Min. Data Outlets			- PA SPKR W/Vol. Control -	- -
General Activity		Teacher prep room				
Electrical / Power Notes		• Power for printer station.				
Aux. Systems Communications – Security Notes		• Data outlet for printer station.				
Special Requirements		• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space				

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.19 – BOYS WC (Minimum 31m²)**

Overview: A dedicated public washroom facility area for Boys.
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring
	Base	Epoxy Flash Cove
	Walls	Wall Tiles With Painted Gypsum Board Above
	Ceiling	Gypsum Board Drop Ceiling – Painted
Ceiling Height Minimum		2450mm In Each Stall, 3050mm In Sink Area
Millwork		
Equipment Provided By School District:		
Equipment Provided By Design Builder:		4 Toilet Room Stalls: 4 toilet paper holders, 4 flush valve toilets, 4 floor drains Sink Area: 2 floor drains min., 1 2-station sink, 2 electric hand dryers, 1 soap dispenser, 2 mirrors (one above each sink station), 1 wall mounted waste receptacle Provide full height wall separations between stalls
Furniture Provided by School District:		

Plumbing / Gas	WC-1 @ 4 - Refer to Plumbing Fixture Schedules	LV-2 - Refer to Plumbing Fixture Schedules	FD-1 @ 6 - Refer to Plumbing Fixture Schedules	-	- -
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- -	n/a Occupant Load	- 4 @ 35 l/s local exhaust to constant volume exhaust energy recovery system - 2175 l/s general exhaust to variable volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting	1 Wall Sconces 9 Recessed Potlight Vanity Wall Sconces	Occupancy Sensor Wall Pods	Emergency lighting	30 fc -	- -

	Recessed down lights				
Electrical / Power		**2** Min. Receptacles		**Electric Hand Dryers** **Sink Sensor** -	**1** -
Aux. Systems / Communications – Security				**- PA SPKR** -	**-** -
General Activity	Washroom				
Electrical / Power Notes	• Provide general use receptacles • Provide individual occupancy sensor control in each stall • Provide power to all washroom fixtures.				
Aux. Systems Communications – Security Notes	• PA speaker				
Special Requirements	• Acoustic separations between adjacent rooms • Exhaust from this room • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide backing as required for all equipment • Slope floors to drain in all WC				

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.20 – UNIVERSAL (Minimum 6m²)**

Overview: A Universal Accessible washroom that can be locked with a privacy latch set. Room to meet the latest BC Building and Accessible code requirements.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring
	Base	Epoxy Flash Cove
	Walls	Wall Tiles With Painted Gypsum Board Above
	Ceiling	Gypsum Board Drop Ceiling – Painted
Ceiling Height Minimum		3050mm
Millwork		
Equipment Provided By School District:		
Equipment Provided By Design Builder:		Provide 1 toilet paper holder, 1 sani disp. 1 soap disp, 1 electric hand dryer, 1 H/C accessible sink, 1 H/C accessible tilt mirror, 1 H/C accessible corner grab bar set, 1 coat hanger on back of door, 1 flush valve toilet, 1 floor drains, 1 wall mounted waste receptacle.
Furniture Provided by School District:		

Plumbing / Gas	WC-1 - Refer to Plumbing Fixture Schedules	LV-4 - Refer to Plumbing Fixture Schedules	FD-1 - Refer to Plumbing Fixture Schedules	-	- -
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- -	n/a Occupant Load	- 35 l/s local exhaust to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting	Vanity Wall Sconce Recessed downlight	Occupancy Sensor Wall Pods	Emergency lighting	30 fc -	- -
Electrical / Power		1 Min. Receptacles		1 Electric Hand Dryer 1 Sink Sensor	-
Aux. Systems / Communications – Security				- -	- -

General Activity	Washroom
Electrical / Power Notes	• Provide power to all required washroom fixtures.
Aux. Systems Communications –	•

Security Notes	
Special Requirements	• Acoustic separations between adjacent rooms • Exhaust from this room • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide backing as required for all equipment • Slope floors to drain in all WC

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.21 – STAFF WC (Minimum 5m²)**
Overview: A washroom dedicated to staff members only.	
Adjacencies: Refer to adjacency diagram.	
Finishes – Floor	Epoxy Flooring
Finishes – Base	Epoxy Flash Cove
Finishes – Walls	Wall Tiles With Painted Gypsum Board Above
Finishes – Ceiling	Gypsum Board Drop Ceiling – Painted
Ceiling Height Minimum	2450mm
Millwork	
Equipment Provided By School District:	
Equipment Provided By Design Builder:	Provide 1 toilet paper holder, 1 sani disp. 1 soap disp, 1 electric hand dryer, 1 H/C accessible sink, 1 H/C accessible tilt mirror, 1 H/C accessible corner grab bar set, 1 coat hanger on back of door, 1 flush valve toilet, 1 floor drains, 1 wall mount waste receptacle
Furniture Provided by School District:	
Plumbing / Gas	WC-1 - Refer to Plumbing Fixture Schedules; LV-1 - Refer to Plumbing Fixture Schedules; FD-1 - Refer to Plumbing Fixture Schedules; -; - -
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum); - -; n/a Occupant Load; - 35 l/s local exhaust to constant volume exhaust energy recovery system; - Light hazard occupancy fire protection
Lighting	Vanity Wall Sconce Recessed down light; Occupancy Sensor Wall Pods; Emergency lighting; 30 fc; - -
Electrical / Power	N/A; 1 Min. Receptacles; N/A; Electric Hand Dryer Sink sensor; -
Aux. Systems / Communications – Security	- -; - -
General Activity	Washroom
Electrical / Power Notes	• Provide power to all required washroom fixtures.
Aux. Systems Communications – Security Notes	•
Special Requirements	• Acoustic separations between adjacent rooms

	• Exhaust from this room • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide backing as required for all equipment • Slope floors to drain in all WC

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.22 – CUST (Minimum 14m²)**

Overview: A dedicated lockable room that contains a mop sink, storage shelving and room to store a 26" x 66" custodial scrubber when not in use.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring			
	Base	Epoxy Flash Cove			
	Walls	Wall Tiles With Painted Gypsum Board Above			
	Ceiling	Exposed Structure Above			
Ceiling Height Minimum		Exposed Structure Above			
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:		Mop sink			
Furniture Provided by School District:					
Plumbing / Gas		CS-1 - Refer to Plumbing Fixture Schedules	-	FD-1 - Refer to Plumbing Fixture Schedules	- -
Mechanical		- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- Exposed ductwork	n/a Occupant Load	- 35 l/s to constant volume exhaust energy recovery system
Lighting		Lensed Striplights	Occupancy sensor	Emergency Lighting	30 fc
Electrical / Power			2 Min. Receptacles	-	-
Aux. Systems / Communications – Security					- -
General Activity		Custodial room			
Electrical / Power Notes		• Provide general use receptacles and receptacles required for specific custodial equipment			
Aux. Systems Communications – Security Notes		•			
Special Requirements		• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates			

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.23 – STAFF WC (Minimum 5m²)**
Overview: A washroom dedicated to staff members only.	
Adjacencies: Refer to adjacency diagram.	
Finishes – Floor	Epoxy Flooring
Finishes – Base	Epoxy Flash Cove
Finishes – Walls	Wall Tiles With Painted Gypsum Board Above
Finishes – Ceiling	Gypsum Board Drop Ceiling – Painted
Ceiling Height Minimum	2450mm
Millwork	
Equipment Provided By School District:	
Equipment Provided By Design Builder:	Provide 1 toilet paper holder, 1 sani disp. 1 soap disp, 1 electric hand dryer, 1 H/C accessible sink, 1 H/C accessible tilt mirror, 1 H/C accessible corner grab bar set, 1 coat hanger on back of door, 1 flush valve toilet, 1 floor drains, 1 wall mounted waste receptacle.
Furniture Provided by School District:	

Plumbing / Gas	WC-1 - Refer to Plumbing Fixture Schedules	LV-1 - Refer to Plumbing Fixture Schedules	FD-1 - Refer to Plumbing Fixture Schedules	-	-
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	-	n/a Occupant Load	- 35 l/s local exhaust to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting	Vanity Wall Sconce Recessed downlight	Occupancy Sensor Wall Pods	Emergency light	30 fc -	- -
Electrical / Power		1 Min. Receptacles		Electric Hand Dryer Sink sensor	
Aux. Systems / Communications – Security				- -	- -

General Activity	Washroom
Electrical / Power Notes	• Provide power to all required washroom fixtures.

Aux. Systems Communications – Security Notes	•
Special Requirements	• Acoustic separations between adjacent rooms • Exhaust from this room • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide backing as required for all equipment • Slope floors to drain in all WC

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.24 – UNIVERSAL (Minimum 6m²)**

Overview: A Universal Accessible washroom that can be locked with a privacy latch set. Room to meet the latest BC Building and Accessible code requirements.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring
	Base	Epoxy Flash Cove
	Walls	Wall Tiles With Painted Gypsum Board Above
	Ceiling	Gypsum Board Drop Ceiling – Painted
Ceiling Height Minimum		2450mm
Millwork		
Equipment Provided By School District:		
Equipment Provided By Design Builder:		Provide 1 toilet paper holder, 1 sani disp. 1 soap disp, 1 electric hand dryer, 1 H/C accessible sink, 1 H/C accessible tilt mirror, 1 H/C accessible corner grab bar set, 1 coat hanger on back of door, 1 flush valve toilet, 1 floor drains, 1 wall mount waste receptacle
Furniture Provided by School District:		

Plumbing / Gas	WC-1 - Refer to Plumbing Fixture Schedules	LV-4 - Refer to Plumbing Fixture Schedules	FD-1 - Refer to Plumbing Fixture Schedules	-	- -
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- -	n/a Occupant Load	- 35 l/s local exhaust to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting	Recessed downlight Vanity Wall Sconce	Occupancy Sensor Wall Pods	Emergency Lighting	30 fc	- -
Electrical / Power		1 Min. Receptacles		1 Electric Hand Dryer 1 Sink sensor	
Aux. Systems / Communications – Security				- -	- -

General Activity	Washroom
Electrical / Power Notes	• Provide power to required washroom fixtures.
Aux. Systems Communications – Security Notes	•

Special Requirements	• Acoustic separations between adjacent rooms • Exhaust from this room • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide backing as required for all equipment • Slope floors to drain in all WC

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.25 – GIRLS WC (Minimum 31m²)**

Overview: A dedicated public washroom facility area for Girls.
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring
	Base	Epoxy Flash Cove
	Walls	Wall Tiles With Painted Gypsum Board Above
	Ceiling	Gypsum Board Drop Ceiling – Painted
Ceiling Height Minimum		2450mm In Each Stall, 3050mm In Sink Area
Millwork		
Equipment Provided By School District:		
Equipment Provided By Design Builder:		4 Toilet Room Stalls: 4 toilet paper holders, 4 flush valve toilets, 4 floor drains Sink Area: 2 floor drains min., 1 2-station sink, 2 electric hand dryers, 1 soap dispenser, 2 mirrors (one above each sink station), 1 wall mounted waste receptacle Provide full height wall separations between stalls
Furniture Provided by School District:		

Plumbing / Gas	WC-1 @ 4 - Refer to Plumbing Fixture Schedules	LV-2 - Refer to Plumbing Fixture Schedules	FD-1 @ 6 - Refer to Plumbing Fixture Schedules	-	-
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	-	n/a Occupant Load	- 4 @ 35 l/s local exhaust to constant volume exhaust energy recovery system - 1780 l/s general exhaust to variable volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting	Recessed downlights Vanity Wall Sconces	Occupancy Sensor Wall Pods	Emergency lighting	30 fc	-0.4 min/average
Electrical / Power		2 Min. Receptacles		1 Electric Hand Dryer 1 Sink Sensor	1 Speaker
Aux. Systems /				- PA SPKR	-

Communications – Security	
General Activity	Washroom
Electrical / Power Notes	• Provide power to all required washroom fixtures. • Provide individual occupancy sensor control in each stall • Provide general use receptacles
Aux. Systems Communications – Security Notes	• PA speaker
Special Requirements	• Acoustic separations between adjacent rooms • Exhaust from this room • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide backing as required for all equipment • Slope floors to drain in all WC

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.26 – PREP. (Minimum 8m²)**

Overview: A lockable room dedicated to Teacher and Staff prep. Room to include photo copier and appropriate millwork for prep and storage of stationary items.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	T-Bar (1220mm x 610mm)			
Ceiling Height Minimum		3050mm			
Millwork		3xL-1a, 3xU-1; unit to be 2400mm in length.			
Equipment Provided By School District:		Provide 1 printer			
Equipment Provided By Design Builder:					
Furniture Provided by School District:					
Plumbing / Gas		- -	- -	- -	- -	- -
Mechanical		-	- -	n/a Occupant Load	No Special Exhaust	- -
Lighting		Architectural 2x2 Recessed	Occupancy Sensor Wall Pods	N/A	30 fc -	- -
Electrical / Power		N/A	4 Min. Receptacles	N/A	1 Printer	N/A
Aux. Systems / Communications – Security		2 Min. Data Outlets	N/A	N/A	PA SPKR W/Vol. Control	N/A
General Activity		Teacher prep room				
Electrical / Power Notes		• Provide power for printer station.				
Aux. Systems Communications – Security Notes		• Provide data outlet for computer station. • PA speaker				
Special Requirements		• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space				

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.27 – CORRIDOR (Minimum 131m²)**

Overview: A centralized corridor is to be provided in order to access all classrooms, community areas, vertical access, etc..
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide 140 half height single lockers				
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation	-	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		- Architectural feature lighting	Dimming	Emergency Lighting	-30 fc	-0.4 min/average
Electrical / Power		-	2 Min. Receptacles	-	-	-

Aux. Systems / Communications – Security	- -	-2 data/WAP -	- -	- PA SPKRS -	- -
General Activity	Main access corridor				
Electrical / Power Notes	• Provide general maintenance receptacles in all corridors – minimum 5m from corridor ends and maximum 12m intervals throughout • Provide architectural lighting suited to ceiling design and finishes. Lighting in long corridors shall create visual breaks in the ceiling and vary in shape/size/type				
Aux. Systems Communications – Security Notes	• Provide WAPs in corridors maximum 15m apart. • Provide PA speakers maximum 25 m apart				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls				

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.28 – CORRIDOR (Minimum 252m²)**

Overview: A centralized corridor is to be provided in order to access all classrooms, community areas, vertical access, etc..
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	T-Bar (1220mm x 610mm)			
Ceiling Height Minimum		3050mm			
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:					
Furniture Provided by School District:					
Plumbing / Gas		-	-	-	-	-
Mechanical		-	-	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		Architectural feature lighting	Dimming	Emergency Lighting	30 fc -	-0.4 min/average -
Electrical / Power		N/A	1 Min. Receptacles	N/A	N/A -	N/A
Aux. Systems / Communications – Security			2 data/WAP		- PA SPKR -	- -
General Activity		Main access corridor				
Electrical / Power Notes		• Provide general maintenance receptacles in all corridors - minimum 5m from corridor ends and maximum 12m intervals throughout • Provide architectural lighting suited to ceiling design and finishes. Lighting in long corridors shall create visual breaks in the ceiling and vary in shape/size/type				
Aux. Systems Communications – Security Notes		• Provide WAPs in corridors maximum 15m apart. • Provide PA speakers maximum 25 m apart				
Special Requirements		• Acoustic separations between adjacent rooms				

	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.29 – CORRIDOR (Minimum 131m²)**

Overview: A centralized corridor is to be provided in order to access all classrooms, community areas, vertical access, etc..
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Provide 140 half height single lockers				
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Dedicated fan coil, heating/cooling, MERV 13 filtration - High supply, low level return, 1 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation	-	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		- Architectural feature lighting	Dimming	Emergency Lighting	>30 fc	>0.4 min/average

Electrical / Power	- -	**2** Min. Receptacles	- -	- -	- -
Aux. Systems / Communications – Security	- -	**-2 data/WAP** -	- -	**- PA SPKRS** -	- -
General Activity	Main access corridor				
Electrical / Power Notes	• Provide general maintenance receptacles in all corridors – minimum 5m from corridor ends and maximum 12m intervals throughout • Provide architectural lighting suited to ceiling design and finishes. Lighting in long corridors shall create visual breaks in the ceiling and vary in shape/size/type				
Aux. Systems Communications – Security Notes	• Provide WAPs in corridors maximum 15m apart. • Provide PA speakers maximum 25 m apart				
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls				

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.30 – PREP. (Minimum 8m²)**

Overview: A lockable room dedicated to Teacher and Staff prep. Room to include photo copier and appropriate millwork for prep and storage of stationary items.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	T-Bar (1220mm x 610mm)			
Ceiling Height Minimum		3050mm			
Millwork		3xL-1a, 3xU-1			
Equipment Provided By School District:		Provide 1 printer			
Equipment Provided By Design Builder:					
Furniture Provided by School District:					
Plumbing / Gas		-	-	-	-	-
Mechanical		-	-	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		Architectural 2x2 Recessed -	Occupancy Sensor Wall Pods	Emergency lighting	30 fc	-0.4 min/average -
Electrical / Power		N/A	4 Min. Receptacles	N/A	1 Printer -	N/A
Aux. Systems / Communications – Security		2 Min. Data Outlet			- PA SPKR W/Vol. Control -	- -
General Activity		Teacher prep room				
Electrical / Power Notes		• Provide power to printer station.				
Aux. Systems Communications – Security Notes		•				
Special Requirements		• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space				

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.31 – UNIVERSAL (Minimum 6m²)**

Overview: A Universal Accessible washroom that can be locked with a privacy latch set. Room to meet the latest BC Building and Accessible code requirements.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring
	Base	Epoxy Flash Cove
	Walls	Wall Tiles With Painted Gypsum Board Above
	Ceiling	Gypsum Board Drop Ceiling – Painted
Ceiling Height Minimum		3050mm
Millwork		
Equipment Provided By School District:		
Equipment Provided By Design Builder:		Provide 1 toilet paper holder, 1 sani disp. 1 soap disp, 1 electric hand dryer, 1 H/C accessible sink, 1 H/C accessible tilt mirror, 1 H/C accessible corner grab bar set, 1 coat hanger on back of door, 1 flush valve toilet, 1 floor drains, 1 wall mounted waste receptacle
Furniture Provided by School District:		

Plumbing / Gas	WC-1 - Refer to Plumbing Fixture Schedules	LV-4 - Refer to Plumbing Fixture Schedules	FD-1 - Refer to Plumbing Fixture Schedules	-	- -
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- -	n/a Occupant Load	- 35 l/s local exhaust to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting	Vanity Wall Sconce Recessed down light	Occupancy Sensor Wall Pods	Emergency lighting	30 fc -	- -
Electrical / Power	N/A -	1 Min. Receptacles	N/A	1 Electric Hand Dryer 1 Sink Sensor	N/A
Aux. Systems / Communications – Security	0 Min. Data Outlet	N/A	N/A	- N/A -	- N/A -
General Activity	Washroom				
Electrical / Power Notes	• Provide power to all required washroom fixtures.				

Aux. Systems Communications – Security Notes	•
Special Requirements	• Acoustic separations between adjacent rooms • Exhaust from this room • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide backing as required for all equipment • Slope floors to drain in all WC

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.32 – WASHROOMS (Minimum 31m²)**

Overview: A public washroom facility accessible for Staff, Students and Visitors.
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring
	Base	Epoxy Flash Cove
	Walls	Wall Tiles With Painted Gypsum Board Above
	Ceiling	Gypsum Board Drop Ceiling – Painted
Ceiling Height Minimum		2450mm In Each Stall, 3050mm In Sink Area
Millwork		
Equipment Provided By School District:		
Equipment Provided By Design Builder:		4 Toilet Room Stalls: 4 toilet paper holders, 4 sani disp., 4 flush valve toilets, 4 floor drains Sink Area: 2 floor drains min., 1 2-station sink, 2 electric hand dryers, 1 soap dispenser, 2 mirrors (one above each sink station), 1 wall mounted waste receptacle Provide full height wall separations between stalls
Furniture Provided by School District:		

Plumbing / Gas	WC-1 @ 4 - Refer to Plumbing Fixture Schedules	LV-2 - Refer to Plumbing Fixture Schedules	FD-1 @ 6 - Refer to Plumbing Fixture Schedules	-	-
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	-	n/a Occupant Load	- 4 @ 35 l/s local exhaust to constant volume exhaust energy recovery system - 2180 l/s general exhaust to variable volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting	Vanity Wall Sconce Recessed down light	Occupancy Sensor Wall Pods	Emergency lighting	30 fc	-
Electrical / Power	N/A	2 Min. Receptacles	N/A	Electric Hand Dryer 2 Sink Sensor	N/A
Aux. Systems /	0 Min. Data Outlet	N/A	N/A	- PA SPKR	N/A

Communications – Security	
General Activity	Washroom
Electrical / Power Notes	• Provide power to all required washroom fixtures. • Provide individual occupancy sensor control in each stall
Aux. Systems Communications – Security Notes	• PA speaker
Special Requirements	• Acoustic separations between adjacent rooms • Exhaust from this room • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide backing as required for all equipment • Slope floors to drain in all WC

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.33 – CUSTODIAL (Minimum 18m²)**

Overview: A dedicated lockable room that contains a mop sink, storage shelving and room to store a 26" x 66" custodial scrubber when not in use.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring				
	Base	Epoxy Flash Cove				
	Walls	Wall Tiles With Painted Gypsum Board Above				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:		Mop sink 24 x 24 with faucet, cleaning solution dispenser				
Furniture Provided by School District:						
Plumbing / Gas		CS-1 - Refer to Plumbing Fixture Schedules	HD-1 - Refer to Plumbing Fixture Schedules	FD-1 - Refer to Plumbing Fixture Schedules	- -	- -
Mechanical		- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum) - 2 @ heavy duty, hydronic, fan assisted air conditioner, condensate to nearest drain, 6.6 kW cooling - Wall mount, vandal proof, temperature sensor (Non-adjustable)	- Exposed ductwork	n/a Occupant Load	- 35 l/s to constant volume exhaust energy recovery system	- Ordinary hazard (Group 1) occupancy fire protection
Lighting		Lensed Strip Lights	Occupancy Sensor Wall Pods	Emergency lighting	30 fc	- -
Electrical / Power		Panels	2 Min. Receptacles	N/A -	- Solar PV equipment	N/A -
Aux. Systems / Communications – Security		0 Min. Data Outlets	N/A	N/A	- PA SPKR	-
General Activity		Custodial room				
Electrical / Power Notes		• Distribution center/transformer/panels • Solar PV inverters				

Aux. Systems Communications – Security Notes	• Data outlets for solar inverters • PA speaker
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.34 – STAFF WC (Minimum 5m²)**
Overview: A washroom dedicated to staff members only.	
Adjacencies: Refer to adjacency diagram.	
Finishes – Floor	Epoxy Flooring
Base	Epoxy Flash Cove
Walls	Wall Tiles With Painted Gypsum Board Above
Ceiling	Gypsum Board Drop Ceiling – Painted
Ceiling Height Minimum	3050mm
Millwork	
Equipment Provided By School District:	
Equipment Provided By Design Builder:	Provide 1 toilet paper holder, 1 sani disp. 1 soap disp, 1 electric hand dryer, 1 H/C accessible sink, 1 H/C accessible tilt mirror, 1 H/C accessible corner grab bar set, 1 coat hanger on back of door, 1 flush valve toilet, 1 floor drain, 1 wall mount waste receptacle.
Furniture Provided by School District:	

Plumbing / Gas	WC-1 - Refer to Plumbing Fixture Schedules	LV-1 - Refer to Plumbing Fixture Schedules	FD-1 - Refer to Plumbing Fixture Schedules	-	-
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	-	n/a Occupant Load	- 35 l/s local exhaust to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting	Vanity Wall Sconce Recessed down light	Occupancy Sensor Wall Pods	Emergency lighting	30 fc -	-
Electrical / Power	N/A	1 Min. Receptacles	N/A	1 Electric Hand Dryer 1 Sink Sensor	N/A
Aux. Systems / Communications – Security	0 Min. Data Outlets	N/A	N/A	- N/A	- N/A

General Activity	Washroom
Electrical / Power Notes	• Provide power to all required washroom fixtures.
Aux. Systems Communications – Security Notes	•
Special Requirements	• Acoustic separations between adjacent rooms

	• Exhaust from this room • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide backing as required for all equipment • Slope floors to drain in all WC

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.35 – VEST.**

Overview: A entry Vestibule is to be provided at selected entries. Vestibule sizing and dimensions to meet the latest BC Building Code and accessible Requirements.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	T-Bar (1220mm x 610mm)			
Ceiling Height Minimum		3050mm			
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:					
Furniture Provided by School District:					
Plumbing / Gas		-	-	-	-	-
Mechanical		-	-	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		2 2x2 Recessed	Occupancy sensor	Emergency lighting	30 fc -	- -
Electrical / Power		N/A	1 Min. Receptacles	N/A	N/A	N/A
Aux. Systems / Communications – Security		0 Min. Data Outlets	N/A	N/A	- N/A -	- N/A -
General Activity		Acoustic vestibule between lighting and sound area and corridor				
Electrical / Power Notes		• Provide general use receptacle.				
Aux. Systems Communications – Security Notes		•				
Special Requirements		• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space				

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.36 – UNIVERSAL (Minimum 6m²)**
Overview: A Universal Accessible washroom that can be locked with a privacy latch set. Room to meet the latest BC Building and Accessible code requirements.	
Adjacencies: Refer to adjacency diagram.	
Finishes – Floor	Epoxy Flooring
Finishes – Base	Epoxy Flash Cove
Finishes – Walls	Wall Tiles With Painted Gypsum Board Above
Finishes – Ceiling	Gypsum Board Drop Ceiling – Painted
Ceiling Height Minimum	3050mm
Millwork	
Equipment Provided By School District:	
Equipment Provided By Design Builder:	Provide 1 toilet paper holder, 1 sani disp. 1 soap disp, 1 electric hand dryer, 1 H/C accessible sink, 1 H/C accessible tilt mirror, 1 H/C accessible corner grab bar set, 1 coat hanger on back of door, 1 flush valve toilet, 1 floor drains, 1 wall mount waste receptacle
Furniture Provided by School District:	

Plumbing / Gas	WC-1 - Refer to Plumbing Fixture Schedules	LV-4 - Refer to Plumbing Fixture Schedules	FD-1 - Refer to Plumbing Fixture Schedules	-	- -
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- -	n/a Occupant Load	- 35 l/s local exhaust to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting	Vanity Wall Sconce Recessed down light	Occupancy Sensor Wall Pods	Emergency lighting	30 fc -	- -
Electrical / Power	N/A	1 Min. Receptacles	N/A	Electric Hand Dryer Sink sensor	N/A
Aux. Systems / Communications – Security	0 Min. Data Outlets	N/A	N/A	- N/A -	- N/A -

General Activity	Washroom
Electrical / Power Notes	• Provide power to all required washroom fixtures.
Aux. Systems	•

Communications – Security Notes	
Special Requirements	• Acoustic separations between adjacent rooms • Exhaust from this room • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide backing as required for all equipment • Slope floors to drain in all WC

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.37 – WASHROOMS (Minimum 31m²)**

Overview: A dedicated public washroom facility area for Students.
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Epoxy Flooring
	Base	Epoxy Flash Cove
	Walls	Wall Tiles With Painted Gypsum Board Above
	Ceiling	Gypsum Board Drop Ceiling – Painted
Ceiling Height Minimum		2450mm In Each Stall, 3050mm In Sink Area
Millwork		
Equipment Provided By School District:		
Equipment Provided By Design Builder:		4 Toilet Room Stalls: 4 toilet paper holders, 4 sani disp., 4 flush valve toilets, 4 floor drains Sink Area: 2 floor drains min., 1 2-station sink, 2 electric hand dryers, 1 soap dispenser, 2 mirrors (one above each sink station), 1 wall mount waste receptacle Provide full height wall separations between stalls
Furniture Provided by School District:		

Plumbing / Gas	WC-1 @ 4 - Refer to Plumbing Fixture Schedules	LV-2 - Refer to Plumbing Fixture Schedules	FD-1 @ 6 - Refer to Plumbing Fixture Schedules	-	-
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	-	n/a Occupant Load	- 4 @ 35 l/s local exhaust to constant volume exhaust energy recovery system - 1780 l/s general exhaust to variable volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting	Vanity Wall Sconces Recessed down lights	Occupancy Sensor Wall Pods	Emergency light	30 fc	-
Electrical / Power	N/A	2 Min. Receptacles	N/A	1 Electric Hand Dryer 1 Sink Sensor	1 Speaker N/A
Aux. Systems /	0 Min. Data Outlets	N/A	N/A	- PA SPKR	- N/A

Communications – Security					-
General Activity	Washroom				
Electrical / Power Notes	• Provide power to all required washroom fixtures. • Provide individual occupancy sensor control in each stall • Provide general use receptacles				
Aux. Systems Communications – Security Notes	• PA speaker				
Special Requirements	• Acoustic separations between adjacent rooms • Exhaust from this room • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide backing as required for all equipment • Slope floors to drain in all WC				

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.38 – STAFF WC (Minimum 5m²)**
Overview: A washroom dedicated to staff members only.	
Adjacencies: Refer to adjacency diagram.	
Ceiling Height Minimum	3050mm
Millwork	
Equipment Provided By School District:	
Equipment Provided By Design Builder:	**Provide 1 toilet paper holder, 1 sani disp. 1 soap disp, 1 electric hand dryer, 1 H/C accessible sink, 1 H/C accessible tilt mirror, 1 H/C accessible corner grab bar set, 1 coat hanger on back of door, 1 flush valve toilet, 1 floor drains, 1 wall mount waste receptacle**
Furniture Provided by School District:	

Plumbing / Gas	WC-1 - Refer to Plumbing Fixture Schedules	LV-1 - Refer to Plumbing Fixture Schedules	FD-1 - Refer to Plumbing Fixture Schedules	-	-
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	-	n/a Occupant Load	- 35 l/s local exhaust to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting	Vanity Wall Sconce Recessed down light	Occupancy Sensor Wall Pods	Emergency lighting	30 fc -	-
Electrical / Power	N/A	1 Min. Receptacles	N/A	1 Electric Hand Dryer 1 Sink Sensor	N/A
Aux. Systems / Communications – Security	0 Min. Data Outlets	N/A	N/A	- N/A	- N/A
General Activity	Washroom				
Electrical / Power Notes	• Provide power to all required washroom fixtures.				
Aux. Systems Communications – Security Notes	•				
Special Requirements	• Acoustic separations between adjacent rooms • Exhaust from this room • Provide acoustic batt insulation in all interior stud walls				

	• Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide backing as required for all equipment • Slope floors to drain in all WC

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.39 – PREP. (Minimum 8m²)**

Overview: A lockable room dedicated to Teacher and Staff prep. Room to include photo copier and appropriate millwork for prep and storage of stationary items.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	T-Bar (1220mm x 610mm)			
Ceiling Height Minimum		3050mm			
Millwork		3xL-1a, 3xU-1; unit to be 2400mm in length.			
Equipment Provided By School District:		Provide 1 printer			
Equipment Provided By Design Builder:					
Furniture Provided by School District:					
Plumbing / Gas		-	-	-	-	-
Mechanical		-	-	n/a Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		Architectural 2x2 Recessed	Occupancy Sensor Dimming	Emergency lighting	30 fc -	- -
Electrical / Power		N/A	4 Min. Receptacles	N/A	1 Printer	N/A
Aux. Systems / Communications – Security		2 Min. Data Outlets	N/A	N/A	- PA SPKR W/Vol. Control -	- N/A -
General Activity		Teacher prep room				
Electrical / Power Notes		• Provide power for printer station.				
Aux. Systems Communications – Security Notes		• Provide data outlets for printer.				
Special Requirements		• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space				

Functional Area	Functional Unit
24.00 – DESIGN SPACE	**24.40 – CORRIDOR (Minimum 21m²)**

Overview: A centralized corridor is to be provided in order to access all classrooms, community areas, vertical access, etc..
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	T-Bar (1220mm x 610mm)				
Ceiling Height Minimum		3050mm				
Millwork		3xL-1a, 3xU-1; unit to be 2400mm in length.				
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		- -	- -	- -	- -	- -
Mechanical		Yes Air Conditioning	- -	n/a Occupant Load	No Special Exhaust	- -
Lighting		Architectural feature lighting	Dimming	Emergency Lighting	30 fc	-0.4 min/average -
Electrical / Power		N/A	3 Min. Receptacles	N/A -	-	-
Aux. Systems / Communications – Security					- PA SPKRS -	- -
General Activity		Exit corridor				
Electrical / Power Notes		• Provide general maintenance receptacles in all corridors – minimum 5m from corridor ends and maximum 12m intervals throughout • Provide architectural lighting suited to ceiling design and finishes. Lighting in long corridors shall create visual breaks in the ceiling and vary in shape/size/type				
Aux. Systems Communications –		• Provide WAPs in corridors maximum 15m apart. • Provide PA speakers maximum 25 m apart				

Security Notes	
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls

25.00 Vertical Circulation

Functional Area	Functional Unit
25.00 – VERTICAL CIRCULATION	**25.01 – ELEV. (Minimum 11m²)**
Overview: A vertical transportation device that is located and stops at each floor level.	
Adjacencies: Refer to adjacency diagram.	
Finishes – Floor	N/A
Finishes – Base	N/A
Finishes – Walls	Concrete, Concrete block, or Gypsum Board
Finishes – Ceiling	Exposed Structure Above
Ceiling Height Minimum	Exposed Structure Above
Millwork	
Equipment Provided By School District:	
Equipment Provided By Design Builder:	
Furniture Provided by School District:	
Plumbing / Gas	PD-1 - Refer to Plumbing Fixture Schedules -
Mechanical	- Negative pressurization - -
Lighting	Lensed LED Strip light - -
Electrical / Power	N/A - 1 Min. Receptacles
Aux. Systems / Communications – Security	1 Min. Data Outlets N/A
General Activity	Elevator shaft
Electrical / Power Notes	• Provide maintenance luminaire and receptacle at the top and bottom of the elevator shaft. Include light switch inside shaft at each location. • Provide connect to all elevator equipment
Aux. Systems Communications – Security Notes	• Provide telephone line to elevator controller • Provide all cabling required for security and access control as part of elevator travelling cable
Special Requirements	• Monolithic concrete pour for base of elevator shaft or equivalent water barrier to protect pit

PD-1 - Refer to Plumbing Fixture Schedules	-	-	-	- -	
- Negative pressurization	- -	n/a Occupant Load	- 160 l/s local exhaust to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection	
Lensed LED Strip light -	-	N/A	-	- -	
N/A -	1 Min. Receptacles	2 -	N/A -	N/A -	
1 Min. Data Outlets	N/A	N/A	- N/A -	- N/A -	

	• Provide 1 drain in bottom of shaft, • Slope bottom of shaft min. 2% to drain

Functional Area	Functional Unit
25.00 – VERTICAL CIRCULATION	**25.02 – STAIR (Minimum 39m²)**

Overview: A dedicated space which stairs from each floor level will be provided.
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Heavy duty, hydronic, fan assisted air conditioner, 81w/m² heating - Wall mount, vandal proof, temperature sensor (Non-adjustable)	-	N/A Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		Surface suspended linear	daylight	Emergency Lighting	30 fc	-
Electrical / Power		N/A	Receptacles	N/A	N/A	
Aux. Systems / Communications – Security		0 Min. Data Outlets	N/A	N/A	- PA SPKRS	-
General Activity		Exit stair				
Electrical / Power Notes		• Maintenance receptacle at every landing. • Provide direct/indirect suspended linear lighting in all areas with ceiling heights above 3m • Provide matching surface mounted luminaires in low height areas.				

Aux. Systems Communications – Security Notes	• PA Speaker at every floor.
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space

Functional Area	Functional Unit
25.00 – VERTICAL CIRCULATION	**25.02a – ACCESS (Minimum 12m²)**
Overview: A centralized corridor is to be provided in order to access all classrooms, community areas, vertical access, etc..	
Adjacencies: Refer to adjacency diagram.	
Finishes – Floor	Resilient Flooring
Finishes – Base	Rubber Base
Finishes – Walls	Painted Gypsum Board
Finishes – Ceiling	Exposed Structure Above
Ceiling Height Minimum	Exposed Structure Above
Millwork	
Equipment Provided By School District:	
Equipment Provided By Design Builder:	
Furniture Provided by School District:	

Plumbing / Gas	-	-	-	-	-
Mechanical	- Heavy duty, hydronic, fan assisted air conditioner, 260w/m² heating - Wall mount, vandal proof, temperature sensor (Non-adjustable)	-	N/A Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting	Surface linear	Dimming	Emergency Lighting	30 fc	-
Electrical / Power	N/A	1 Min. Receptacles	N/A	N/A	N/A
Aux. Systems / Communications – Security	0 Min. Data Outlets	N/A	N/A	- N/A	- N/A

General Activity	Exit stair corridor to exterior
Electrical / Power Notes	• Maintenance receptacle • Provide direct/indirect suspended linear lighting in all areas with ceiling heights above 3m • Provide matching surface mounted luminaires in low height areas.
Aux. Systems Communications –	•

Security Notes	
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space

Functional Area	Functional Unit
25.00 – VERTICAL CIRCULATION	**25.03 – STAIR (Minimum 39m²)**

Overview: A dedicated space which stairs from each floor level will be provided.
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Heavy duty, hydronic, fan assisted air conditioner, 82w/m² heating - Wall mount, vandal proof, temperature sensor (Non-adjustable)	-	N/A Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		Direct Indirect suspended linear	Occupancy sensor	Emergency Lighting	30 fc	-
Electrical / Power		N/A	1 Min. Receptacles	N/A	N/A	N/A
Aux. Systems / Communications – Security		0 Min. Data Outlets	N/A	N/A	- PA SPKR	-
General Activity		Exit stair				
Electrical / Power Notes		• Maintenance receptacle. • Provide direct/indirect suspended linear lighting in all areas with ceiling heights above 3m • Provide matching surface mounted luminaires in low height areas.				
Aux. Systems		•				

Communications – Security Notes	
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space

Functional Area	Functional Unit
25.00 – VERTICAL CIRCULATION	**25.04 – STAIR (Minimum 21m²)**

Overview: A dedicated space which stairs from each floor level will be provided.
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
Mechanical		- Heavy duty, hydronic, fan assisted air conditioner, 110w/m² heating - Wall mount, vandal proof, temperature sensor (Non-adjustable)	-	N/A Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		Direct Indirect suspended linear	Occupancy sensor	Emergency Lighting	30 fc	-
Electrical / Power		N/A	2 Min. Receptacles	N/A	N/A	N/A
Aux. Systems / Communications – Security		0 Min. Data Outlets	N/A	N/A	- PA SPKR	-
General Activity		Exit stair				
Electrical / Power Notes		• Maintenance receptacles. • Provide direct/indirect suspended linear lighting in all areas with ceiling heights above 3m • Provide matching surface mounted luminaires in low height areas.				
Aux. Systems		•				

Communications – Security Notes	
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space

Functional Area	Functional Unit
25.00 – VERTICAL CIRCULATION	**25.05 – STAIR (Minimum 39m²)**

Overview: A dedicated space which stairs from each floor level will be provided.
Note: Design Space aggregate area and equipment must be met, however individual room sizes and count may be varied to suit the Building layout. Functional sizes and widths must be maintained throughout.

Adjacencies: Refer to adjacency diagram.

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	Exposed Structure Above				
Ceiling Height Minimum		Exposed Structure Above				
Millwork						
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		-	-	-	-	-
		-	-	-	-	-
Mechanical		- Heavy duty, hydronic, fan assisted air conditioner, 125w/m² heating - Wall mount, vandal proof, temperature sensor (Non-adjustable)	- -	N/A Occupant Load	No Special Exhaust	- Light hazard occupancy fire protection
Lighting		Direct Indirect suspended linear	Dimming Occupancy sensor	Emergency Lighting	30 fc -	- -
Electrical / Power		N/A	3 Min. Receptacles	N/A -	N/A -	N/A
Aux. Systems / Communications – Security		0 Min. Data Outlets	N/A	N/A	- PA SPKRS -	- N/A -
General Activity		Exit stair				
Electrical / Power Notes		• Maintenance receptacles at each floor. • Provide direct/indirect suspended linear lighting in all areas with ceiling heights above 3m • Provide matching surface mounted luminaires in low height areas.				
Aux. Systems		• PA Speaker at each floor.				

Communications – Security Notes	
Special Requirements	• Acoustic separations between adjacent rooms • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Provide fully accessible doors into this space

George Pringle Secondary School
Appendix 1B Room Data Sheets
NLC Childcare Building

Childcare Building 1.00 Common Areas

Functional Area	Functional Unit
1.00 - COMMON AREAS	**100-A –VESTIBULE (Minimum 12m²)**

Overview:

An entry Vestibule is to be provided at selected entries. Vestibule sizing and dimensions to meet the latest BC Building Code and accessible Requirements.

Adjacencies

Refer to adjacency diagram

Finishes	Floor	Resilient Flooring			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	Painted Gypsum Board or T-Bar			
Ceiling Height Minimum		2450mm			
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:					
Furniture Provided by School District:					
Plumbing / Gas		-	-	-	-	-
		-	-	-	-	-
Mechanical		- Heavy duty, electric resistance heat, fan assisted heater - 150 w/m2 - Wall mount, vandal proof, temperature sensor (Non-adjustable)	-	**N/A** Occupant Load	**No** Special Exhaust	- Light hazard occupancy fire protection
Lighting		- volumetric architectural lighting	- Dimming - **Occupancy sensor** - **Daylight sensor**	- **Emergency lighting**	- 30 fc	- 0.4 min/avg
Electrical / Power		-	- 1 min. receptacle	-	-	-
Aux. Systems / Communications – Security		-	-	-	-	-
General Activity						
Electrical / Power Notes		• Provide general use receptacle • Provide connection to door operators and pushbuttons				

Aux. Systems Communications – Security Notes	• Provide intrusion keypad – NLC space shall be separate partition to the main intrusion system if in the same building • Provide fire alarm annunciator panel if required. • Provide door contacts on exterior doors.
Special Requirements	• Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Acoustic separations between adjacent rooms • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls • Provide H/C accessible door operator buttons for both sets of doors • Provide Aluminum Curtain Wall Doors and Glazing. • Provide exterior freestanding door stops with H/C door operator buttons integrated • Provide 2400x6300 exterior canopy to protect Vestibule 1.01 entrance.

Functional Area	Functional Unit
1.00 - COMMON AREAS	**100 – COMMON AREA (Minimum 53m²)**
Overview: The common area will serve as a gathering and multi-purpose area and will act as a central hub for the building	
Adjacencies: Refer to adjacency diagram. Common area to be open to the kitchen area	
Finishes Floor	Resilient Flooring
Base	Rubber Base
Walls	Painted Gypsum Board
Ceiling	Painted Gypsum Board or T-Bar
Ceiling Height Minimum	2750mm
Millwork	
Equipment Provided By School District:	
Equipment Provided By Design Builder:	
Furniture Provided by School District:	
Plumbing / Gas	

Mechanical	- Common gas fired furnace with Kitchen 1.04, Staff 4.03 and Laundry 4.05 - DX split coil heat pump with exterior mounted outdoor unit to provide primary heating/cooling with gas back-up for heat, MERV 13 filtration - High supply, low level return, 1.5 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- Exposed or concealed ductwork	- -	**No** Special Exhaust	- Light hazard occupancy fire protection
Lighting	- recessed direct/indirect architectural lighting	**- Dimming** **- Occupancy sensors** **- Wall pods**	**- Emergency lighting**	- 30 fc	**- 0.6 min/avg**
Electrical / Power	-	- 5 min receptacles	-	-	-
Aux. Systems / Communications – Security	-	- 1@2data/WAP	**- wall mounted telephone**	**- PA speaker**	-
General Activity					
Electrical / Power Notes	• Provide receptacles around perimeter • Provide connection to any specific equipment such as bottle fill stations, kitchen equipment etc.				
Aux. Systems Communications – Security Notes	• Provide PA speaker if NLC is in the main building • Provide intrusion devices as required				
Special Requirements	• Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates				

	• Acoustic separations between adjacent rooms • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls • Provide Aluminum Curtain Wall Doors and Glazing at exterior. • Provide Wood Door with Steel Frame. • Common Area 1.02 is open floor plan to Kitchen 1.04 • Provide Wood Door with Steel Frame to interior rooms. • Provide fire extinguishers to fire code and B.C.B.C. • Provide Wood Door with Steel Frame and vision panel. • Provide Aluminum Doors with Aluminum Frames and vision panels. • Provide exterior freestanding door stops with H/C door operator buttons integrated

Functional Area	Functional Unit
1.00 - COMMON AREAS	**104 – ACCESSIBLE W/R (Minimum 7m²)**
Overview: A fully H/C accessible washroom, toilet and sink	
Adjacencies: Refer to adjacency diagram	
Finishes Floor Base Walls Ceiling	Epoxy Flooring Epoxy Flash Cove Wall Tile Painted Gypsum Board or T-Bar
Ceiling Height Minimum	2450mm
Millwork	
Equipment Provided By School District:	
Equipment Provided By Design Builder:	Provide 1 flush valve toilet, 1 H/C grab bar corner unit, 1 t.p. disp, 1 sani disp, 1 h/c shelf, 1 H/C sink, 1 H/C tilt mirror, 1 soap disp., 1 paper towel disp., 1 recessed garbage container, 1 floor drain, 1 coat hook on back of door
Furniture Provided by School District:	

Plumbing / Gas	WC-2 - Refer to Plumbing Fixture Schedules	LV-4 - Refer to Plumbing Fixture Schedules	FD-1 - Refer to Plumbing Fixture Schedules	- -	- -
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- -	**N/A** Occupant Load	- 35 l/s to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting	- vanity luminaire - **recessed downlight**	- **occupancy sensor wall switch**	- Emergency lighting	- 20fc	- 0.4 min/avg
Electrical / Power	-	-	-	- hand dryer - plumbing fixtures	-
Aux. Systems / Communications – Security	-	-	-	-	-

General Activity	
Electrical / Power Notes	• Provide power to all plumbing fixtures and hand dryer
Aux. Systems Communications – Security Notes	• Provide panic system pushbuttons, door operator and dome light as required
Special Requirements	• Provide acoustic batt insulation in all interior stud walls

	• Provide acoustic caulk under all interior wall bottom plates • Acoustic separations between adjacent rooms • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls • Provide backing as required for all equipment • Slope floors to drain in all WC

Functional Area	Functional Unit
1.00 - COMMON AREAS	100-B – KITCHEN (Minimum 19m²)

Overview:
A kitchen space with sink, refrigerator, range, dishwasher, and double sink

Adjacencies:
Refer to adjacency diagram

Finishes	Floor	Epoxy Flooring				
	Base	Epoxy Flash Cove				
	Walls	Wall Tile				
	Ceiling	Painted Gypsum Board or T-Bar				
Ceiling Height Minimum		2750mm				
Millwork		8xL-1, 1xL-2, 1xL-3, 6xU-1, 2xU-2, 1xU-3, 1xU-4, 1xU-5, 1xL-2a, 2xL-3a, 1xU-6				
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:		Provide one under counter refrigerator, 2 modular tables, 10 chairs				
Plumbing / Gas		SK-1 - Refer to Plumbing Fixture Schedules	SK-5 - Refer to Plumbing Fixture Schedules	- -	- -	- -
Mechanical		- Common gas fired furnace with Common Area 1.02, Staff 4.03 and Laundry 4.05 - DX split coil heat pump with exterior mounted outdoor unit to provide primary heating/cooling with gas back-up for heat, MERV 13 filtration - High supply, low level return, 1.5 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation	- Exposed or concealed ductwork	10 Occupant Load	- Local (non-DDC control) range hood - Exhaust to discharge at roof level	- Light hazard occupancy fire protection

	- Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)				
Lighting	**- recessed troffer**	**- dimming** - wall pod	**- Emergency lighting**	**- 60fc**	**- 0.6 min/avg**
Electrical / Power	-	- 6 min receptacles	-	**- kitchen equipment** -kitchen HVAC equipment	-
Aux. Systems / Communications – Security	-	-	-	-	-
General Activity					
Electrical / Power Notes	• Provide power for all kitchen equipment • Provide general use above counter receptacles • All equipment connections and receptacles will be minimum 20A				
Aux. Systems Communications – Security Notes					
Special Requirements	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Acoustic separations between adjacent rooms • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls				

Childcare Building 2.00 A Under 36 Months

Functional Area	Functional Unit
2.00 – A – UNDER 36 MONTHS	107 – A- UNDER 36 MONTHS (Minimum 60m²)

Overview

This is the main area for children under 36 months old. Provide a storage area with millwork and lockable gate with exterior entrance door.
Area to be provided for 12 children under 36 months.

Adjacencies:

Refer to adjacency diagram. A – Under 36 Months to have direct sightline through entrance door to Common Area 1.02

Finishes	Floor	Resilient Flooring
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	Painted Gypsum Board or T-Bar
Ceiling Height Minimum		2750mm
Millwork		7xM-1, 1xM-4, 1xL-2, 2xL-4, 3xU-1, 1xU-2. Kitchenette millwork length totals 3140mm
Equipment Provided By School District:		
Equipment Provided By Design Builder:		
Furniture Provided by School District:		

Plumbing / Gas	SK-1 - Refer to Plumbing Fixture Schedules	HD-1 - Refer to Plumbing Fixture Schedules	- -	- -	- -
Mechanical	- Common gas fired furnace with Nap 2.03 - DX split coil heat pump with exterior mounted outdoor unit to provide primary heating/cooling with gas back-up for heat, MERV 13 filtration - High supply, low level return, 1.18 cfm/ft2, <50 fpm air velocity at	- Exposed or concealed ductwork	12 Occupant Load	-	- Light hazard occupancy fire protection

	occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)				
Lighting	- direct/indirect lighting	- Dimming **- Occupancy sensor** **- wall pod(s)**	**- Emergency lighting**	**- 50 fc**	**- 0.6min/avg**
Electrical / Power	-	- 5 min receptacles	-	-	-
Aux. Systems / Communications – Security	- 2 min data outlets	**- 1@2data/WAP**	**- wall mounted telephone**	**- PA spkr**	-
General Activity					
Electrical / Power Notes	• Provide general use receptacles on perimeter walls				
Aux. Systems Communications – Security Notes	• Provide WAP, 2 data outlets and wall mounted telephone at the entry door • Provide PA speaker c/w volume control if NLC is located in the main building				
Special Requirements	• Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Acoustic separations between adjacent rooms • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls • Provide Steel Door with Steel Frame and vision panel. • At exterior door, provide a storage area with the M-1 millwork, enclose storage area with walls that are 1300mm a.f.f. Provide M-4 millwork for interior access • Provide 914x2134 wall opening from A – Under 36 Months 2.01 into W/R 2.02				

Functional Area	Functional Unit
2.00 – A – UNDER 36 MONTHS	**107-C – W/R (Minimum 7m²)**

Overview

A washroom with child height fixtures inside with the intent that the area is supervised and the users will be assisted by the adults using the room

Adjacencies:

Refer to adjacency diagram. Staff to have clear direct sightlines from W/R 2.02 to have direct sightlines to millwork of A - Under 36 Months

Finishes – Floor	Epoxy Flooring
Base	Epoxy Flash Cove
Walls	Wall Tile
Ceiling	Painted Gypsum Board or T-Bar
Ceiling Height Minimum	2750mm
Millwork	2xL-2a, 4xU-6
Equipment Provided By School District:	
Equipment Provided By Design Builder:	Provide 2 flush valve toilets, 2 t.p. disp, 2 sinks, 2 mirrors (600x800), 1 soap disp., 1 paper towel disp., 1 recessed garbage container, 1 floor drain, 2 wall hung change tables (provide backing as required), 2 half height partitions between toilets and millwork
Furniture Provided by School District:	

Plumbing / Gas	WC-2 @ 2 - Refer to Plumbing Fixture Schedules	LV-6 @ 2 - Refer to Plumbing Fixture Schedules	FD-1 - Refer to Plumbing Fixture Schedules	- -	- -
Mechanical	- Negative pressurization	- -	N/A Occupant Load	- 70 l/s to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting	- vanity luminaire - recessed downlight	- occupancy sensor wall switch	- Emergency lighting	- 20 fc	- 0.4 min/avg
Electrical / Power	-	-	-	- hand dryer - plumbing fixtures	-
Aux. Systems / Communications – Security	-	-	-	-	-
General Activity					
Electrical / Power Notes	• Provide power to all plumbing fixtures and hand dryer				
Aux. Systems Communications –					

Security Notes	
Special Requirements	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Acoustic separations between adjacent rooms • Provide fully accessible doors or doorways into this space • Provide corner guards at all exterior corners of interior walls • Provide backing as required for all equipment • Slope floors to drain in all WC

Functional Area	Functional Unit				
2.00 – A – UNDER 36 MONTHS	**107-A – NAP (Minimum 6m²)**				
Overview: A quiet room for napping children					
Adjacencies: Refer to adjacency diagram					
Finishes Floor	**Resilient Flooring**				
Base	**Rubber Base**				
Walls	**Painted Gypsum Board**				
Ceiling	**Painted Gypsum Board or T-Bar**				
Ceiling Height Minimum	**2750mm**				
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:					
Furniture Provided by School District:	**Provide 4 Cribs**				
Plumbing / Gas	-	-	-	-	-
Mechanical	- Common gas fired furnace with A-Under 36 Months 2.01 - DX split coil heat pump with exterior mounted outdoor unit to provide primary heating/cooling with gas back-up for heat, MERV 13 filtration - High supply, low level return, 1.4 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted	- Exposed or concealed ductwork	4 Occupant Load	-	- Light hazard occupancy fire protection

	transfer air (non-ceiling plenum)				
Lighting	- direct and indirect lighting	- **Dimming** - Wall pod	-	- **20 fc**	- 0.4 min/avg
Electrical / Power	-	- 2 min receptacles	-	-	-
Aux. Systems / Communications – Security	-	-	-	-	-
General Activity					
Electrical / Power Notes	• Provide independently controlled direct and indirect lighting (both dimmable) • Provide dimming wall pod on outside of the room				
Aux. Systems Communications – Security Notes					

Special Requirements	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Acoustic separations between adjacent rooms • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls • Provide Wood Door with Steel Frame and vision panel.

Functional Area	Functional Unit
2.00 – A – UNDER 36 MONTHS	107-B – NAP (Minimum 15m²)

Overview:
A quiet room for napping children

Adjacencies:
Refer to adjacency diagram

Finishes	Floor	Resilient Flooring			
	Base	Rubber Base			
	Walls	Painted Gypsum Board			
	Ceiling	Painted Gypsum Board or T-Bar			
Ceiling Height Minimum		2750mm			
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:					
Furniture Provided by School District:		Provide 8 Cribs			
Plumbing / Gas		-	-	-	-	-
Mechanical		- Common gas fired furnace with 30 Months to School Age-B 3.01 - DX split coil heat pump with exterior mounted outdoor unit to provide primary heating/cooling with gas back-up for heat, MERV 13 filtration - High supply, low level return, 1.25 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted	- Exposed or concealed ductwork	8 Occupant Load	-	- Light hazard occupancy fire protection

	transfer air (non-ceiling plenum)				
Lighting	- direct and indirect lighting	- Dimming - Wall pod	-	**- 20 fc**	**- 0.4 min/avg**
Electrical / Power	-	- 2 min receptacles	-	-	-
Aux. Systems / Communications – Security	-	-	-	-	-
General Activity					
Electrical / Power Notes	• Provide independently controlled direct and indirect lighting (both dimmable) • Provide dimming wall pod on outside of the room				
Aux. Systems Communications – Security Notes					
Special Requirements	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Acoustic separations between adjacent rooms • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls • Provide Wood Door with Steel Frame and vision panel.				

Childcare Building 3.00 B – 30 Months to School Age

Functional Area	Functional Unit
3.00 – B – 30 MONTHS TO SCHOOL AGE	**106 – B – 30 MONTHS TO SCHOOL AGE (Minimum 108m²)**

Overview:

This is the main area for children 30 months old to school age. Provide a storage area with millwork and lockable gate with exterior entrance door.
Area to be provided for 24 children 30 months to school age.

Adjacencies:

Refer to adjacency diagram. B – 30 Months To School Age to have direct sightline through entrance door to Common Area 1.02

Finishes	Floor	Resilient Flooring				
	Base	Rubber Base				
	Walls	Painted Gypsum Board				
	Ceiling	Painted Gypsum Board or T-Bar				
Ceiling Height Minimum		2750mm				
Millwork		12xM-2, 1xM-4, 3xU-1, 1xU-2, 1xL-2, 1xL-4				
Equipment Provided By School District:						
Equipment Provided By Design Builder:						
Furniture Provided by School District:						
Plumbing / Gas		SK-1 - Refer to Plumbing Fixture Schedules	HD-1 - Refer to Plumbing Fixture Schedules	- -	- -	- -
Mechanical		- Common gas fired furnace with Nap 2.04 - DX split coil heat pump with exterior mounted outdoor unit to provide primary heating/cooling with gas back-up for heat, MERV 13 filtration - High supply, low level return, 1.18 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature	- Exposed or concealed ductwork	24 Occupant Load	-	- Light hazard occupancy fire protection

	sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)				
Lighting	- direct/indirect lighting	**- Dimming** **- Occupancy sensor** **- Wall pod(s)**	**- Emergency lighting**	**- 50 fc**	**- 0.6 min/avg**
Electrical / Power	-	- 5 min receptacles	-	-	-
Aux. Systems / Communications – Security	- 2 min data	**- 1@2 data/WAP**	**- wall mounted telephone**	**- PA SPKR**	-
General Activity					
Electrical / Power Notes	• Provide general use receptacles on perimeter walls				
Aux. Systems Communications – Security Notes	• Provide WAP, data outlets and wall mounted telephone at the entry door • Provide PA speaker c/w volume control if NLC is located in the main building				
Special Requirements	• Provide warning vinyl on glazing into this room where the glazing base starts at or near the floor • Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Acoustic separations between adjacent rooms • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls • Provide Steel door with Steel frame and vision panels. • At exterior door, provide a storage area with the M-1 millwork, enclose storage area with walls that are 1300mm a.f.f. Provide M-4 millwork for interior access • Provide 914x2134 wall opening from B – 30 Months To School Age 3.01 into W/R 3.02 • Provide a raised wood frame play platform (12.5m^2) that is 0.43m above the first floor level. Provide wood fence from first floor level up to 710mm above the platform level. No spaces larger than 4" in the fence (acts as a guardrail for the raised play platform). Provide wood				

	millwork from first floor level up to 710mm above raised platform with storage cabinets accessed from the floor level and not accessible from the raised platform. Provide wood frame ramp up to platform level of max. 3:12 slope. Provide tactile warning strips for the ramp to B.C.B.C. requirements

Functional Area	Functional Unit
3.00 – B – 30 MONTHS TO SCHOOL AGE	**106-A – W/R (Minimum 8m²)**

Overview:

A washroom with child height fixtures inside with the intent that the area is supervised and the users will be assisted by the adults using the room

Adjacencies:

Refer to adjacency diagram

Finishes	Floor	Epoxy Flooring
	Base	Epoxy Flash Cove
	Walls	Wall Tile
	Ceiling	Painted Gypsum Board or T-Bar
Ceiling Height Minimum		2750mm
Millwork		3xL-2a
Equipment Provided By School District:		
Equipment Provided By Design Builder:		Provide 2 flush valve toilets, 3 t.p. disp, 3 sinks, 3 mirrors (600x800), 2 soap disp., 1 paper towel disp., 1 recessed garbage container, 1 floor drain, 3 half height partitions between toilets and millwork
Furniture Provided by School District:		

Plumbing / Gas	WC-2 @ 3 - Refer to Plumbing Fixture Schedules	LV-6 @ 3 - Refer to Plumbing Fixture Schedules	FD-1 - Refer to Plumbing Fixture Schedules	- -	- -
Mechanical	- Negative pressurization	- -	N/A Occupant Load	- 105 l/s to constant volume exhaust energy recovery system	- Light hazard occupancy fire protection
Lighting	- vanity luminaire - recessed downlight	- occupancy sensor wall switch	- Emergency lighting	- 20 fc	- 0.4min/avg
Electrical / Power	-	-	-	- Hand dryer - Plumbing fixtures	-
Aux. Systems / Communications – Security	-	-	-	-	-
General Activity					
Electrical / Power Notes	• Provide power to all plumbing fixtures and hand dryer				
Aux. Systems Communications – Security Notes					

Special Requirements	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Acoustic separations between adjacent rooms • Provide fully accessible doors or doorways into this space • Provide corner guards at all exterior corners of interior walls • Provide backing as required for all equipment • Slope floors to drain in all WC

Functional Area	Functional Unit
3.00 – B – 30 MONTHS TO SCHOOL AGE	**106-B – STORAGE (Minimum 4m²)**
Overview: A storage room	
Adjacencies: Refer to adjacency diagram	
Finishes Floor Base Walls Ceiling	**Resilient Flooring** **Rubber Base** **Painted Gypsum Board** **N/A**
Ceiling Height Minimum	**Exposed Structure (painted)**
Millwork	
Equipment Provided By School District:	
Equipment Provided By Design Builder:	
Furniture Provided by School District:	

Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	- Neutral pressurization - Ducted transfer air (non-ceiling plenum)	- -	**N/A** Occupant Load	-	- Ordinary hazard (Group 1) occupancy fire protection
Lighting	- surface wrap/strip	- **Occupancy sensor wall switch**	-	- **30 fc**	-
Electrical / Power	-	- 1 min receptacle	-	-	-
Aux. Systems / Communications – Security	-	-	-	-	-
General Activity					
Electrical / Power Notes					
Aux. Systems Communications – Security Notes					
Special Requirements	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates				

	• Acoustic separations between adjacent rooms • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls • Provide Wood Door with Steel Frame.

Childcare Building 4.00 Staff and Service

Functional Area	Functional Unit
4.00 – STAFF AND SERVICE	**CORRIDOR (Minimum 5m²)**
Overview: A centralized corridor to provide access from the Common Area 1.02 to Office 4.02, Staff 4.03, Custodial 4.04, and Laundry 4.05	
Adjacencies: Refer to adjacency diagram	
Finishes – Floor	Resilient Flooring
Base	Rubber Base
Walls	Painted Gypsum Board
Ceiling	Painted Gypsum Board or T-Bar
Ceiling Height Minimum	2750mm
Millwork	
Equipment Provided By School District:	
Equipment Provided By Design Builder:	
Furniture Provided by School District:	

Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	- Neutral pressurization- Ducted transfer air (non-ceiling plenum)	- -	N/A Occupant Load	-	- Light hazard occupancy fire protection
Lighting	- Direct/indirect luminaires	- Occupancy sensor - Wall pod	- Emergency lighting	- 20 fc	- 0.6 min/avg
Electrical / Power	-	- 1 min receptacle	-	-	-
Aux. Systems / Communications – Security	-	-	-	-	-

General Activity	
Electrical / Power Notes	• Provide general use receptacle
Aux. Systems Communications – Security Notes	
Special Requirements	• Provide acoustic batt insulation in all interior stud walls

	• Provide acoustic caulk under all interior wall bottom plates • Acoustic separations between adjacent rooms • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls

Functional Area	Functional Unit
4.00 – STAFF AND SERVICE	**103 – OFFICE (Minimum 5m²)**

Overview:
This space will be a private office

Adjacencies:
Refer to adjacency diagram. The office will be a secured area with a direct visual connection to the Common Area 1.02

Finishes	Floor	Carpet Tile
	Base	Rubber Base
	Walls	Painted Gypsum Board
	Ceiling	Painted Gypsum Board or T-Bar
Ceiling Height Minimum		2750mm
Millwork		
Equipment Provided By School District:		Provide 1 computer station, 1 phone, 2 monitors
Equipment Provided By Design Builder:		
Furniture Provided by School District:		Teacher desk with chair

Plumbing / Gas	HD-2 - Refer to Plumbing Fixture Schedules	- -	- -	- -	- -
Mechanical	- Wall mount room temperature sensor with user interface - DX split fan coil heat pump with exterior mounted outdoor unit to provide primary heating/cooling, 4 kW cooling/heating, MERV 13 filtration - Heavy duty, electric resistance baseboard heater, 100 w/m2, for back-up heat	- -	1 Occupant Load	-	- Light hazard occupancy fire protection
Lighting	- Direct/indirect luminiares	- Dimming - Occupancy sensor - Wall pod	-	- 30 fc	- 0.6 min/avg
Electrical / Power	-	- 3 min receptacles	-	-	-

Aux. Systems / Communications – Security	- 2 min data outlets	-	-	-	-
General Activity					
Electrical / Power Notes	• Provide receptacles and data outlets for work station				
Aux. Systems Communications – Security Notes					
Special Requirements	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Acoustic separations between adjacent rooms • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls •				

Functional Area	Functional Unit				
4.00 – STAFF AND SERVICE	**101 – STAFF (Minimum 18m²)**				
Overview: The staff room acts as a private room for all staff members					
Adjacencies: Refer to adjacency diagram					
Finishes Floor	Carpet Tile				
Base	Rubber Base				
Walls	Painted Gypsum Board				
Ceiling	Painted Gypsum Board or T-bar or T-Bar				
Ceiling Height Minimum	2750mm				
Millwork	3xL-1 (total length = 2300mm)				
Equipment Provided By School District:					
Equipment Provided By Design Builder:					
Furniture Provided by School District:	2 modular tables, 8 rolling chairs				
Plumbing / Gas	- -	- -	- -	- -	- -
Mechanical	- Common gas fired furnace with Common Area 1.02, Kitchen 1.04 and Laundry 4.05 - DX split coil heat pump with exterior mounted outdoor unit to provide primary heating/cooling with gas back-up for heat, MERV 13 filtration - High supply, low level return, 1.45 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation - Positive pressurization	- Exposed or concealed ductwork	- -	No Special Exhaust	- Light hazard occupancy fire protection

	- Acoustically lined ducted transfer air (non-ceiling plenum)				
Lighting	- direct/indirect lighting	**- Dimming** **- Occupancy sensor** **- Wall pod**	- Emergency lighting	**- 30 fc**	**- 0.4 min/avg**
Electrical / Power	-	- 5 min receptacles	-	**- kitchen equipment**	-
Aux. Systems / Communications – Security	-	- 1@2data/WAP	- wall mounted telephone	- PA spkr	-
General Activity	Staff Room				
Electrical / Power Notes	• Provide connection to all kitchen equipment (Microwave and Coffee Maker) • Provide general use receptacles				
Aux. Systems Communications – Security Notes	• Provide PA speaker and volume control if NLC space located in the main building • Provide WAP				
Special Requirements	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Acoustic separations between adjacent rooms • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls •				

Functional Area	Functional Unit
4.00 – STAFF AND SERVICE	**C100 – CUSTODIAL (Minimum 2m²)**

Overview:
A dedicated lockable room that contains a Mop sink

Adjacencies:
Refer to adjacency diagram

Finishes	**Floor**	**Resilient Flooring**			
	Base	**Rubber Base**			
	Walls	**Painted Gypsum Board**			
	Ceiling	**N/A**			
Ceiling Height Minimum		**Exposed Structure (painted)**			
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:		**Mop Sink**			
Furniture Provided by School District:					
Plumbing / Gas	CS-2 - Refer to Plumbing Fixture Schedules	- -	- -	- -	- -
Mechanical	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum)	- -	**N/A** Occupant Load	- 35 l/s to constant volume exhaust energy recovery system	- Ordinary hazard (Group 1) occupancy fire protection
Lighting	- surface wrap/strip	- **Occupancy sensor wall switch**	-	- **30 fc**	-
Electrical / Power	-	- 1 min receptacle	-	-	-
Aux. Systems / Communications – Security	-	-	-	-	-
General Activity					
Electrical / Power Notes	•				
Aux. Systems Communications – Security Notes					
Special Requirements	• Provide acoustic batt insulation in all interior stud walls				

	• Provide acoustic caulk under all interior wall bottom plates • Acoustic separations between adjacent rooms • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls • Slope floors to drain in all WC

Functional Area	Functional Unit
4.00 – STAFF AND SERVICE	**102 – LAUNDRY (Minimum 7m²)**
Overview: A dedicated lockable room for a laundry sink and washer and dryer units	
Adjacencies: Refer to adjacency diagram	
Finishes Floor	Epoxy Flooring
Base	Epoxy Flash Cove
Walls	Wall Tile
Ceiling	T-Bar (1220mm x 610mm) or Painted Gypsum Board
Ceiling Height Minimum	2750mm
Millwork	1xL-1 (914mm total width)
Equipment Provided By School District:	
Equipment Provided By Design Builder:	1 Laundry sink, 1 washer, 1 dryer, provide 1 floor drain
Furniture Provided by School District:	

Plumbing / Gas	SK-11 - Refer to Plumbing Fixture Schedules	LB-1 - Refer to Plumbing Fixture Schedules	- -	- -	- -
Mechanical	- Common gas fired furnace with Common Area 1.02, Kitchen 1.04 and Staff 4.03 - DX split coil heat pump with exterior mounted outdoor unit to provide primary heating/cooling with gas back-up for heat, MERV 13 filtration - High supply, low level return, 1.5 cfm/ft2, <50 fpm air velocity at occupied level (5 ft above floor), air outlets <20 NC - Wall mount room temperature sensor with user interface - Wall mount CO2 sensor for demand control ventilation	- Exposed or concealed ductwork	- -	- Negative pressurization - Acoustically lined ducted transfer air (non-ceiling plenum) - 70 l/s to constant volume exhaust energy recovery system	- Ordinary hazard (Group 1) occupancy fire protection

Lighting	**- Surface wrap/strip**	- Occupancy sensor wall switch	-	- 30 fc	-
Electrical / Power	-	- 2 min receptacles	-	- Laundry equipment	-
Aux. Systems / Communications – Security	-	-	-	-	-
General Activity					
Electrical / Power Notes	• Provide power to washer and dryer units				
Aux. Systems Communications – Security Notes					
Special Requirements	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Acoustic separations between adjacent rooms • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls • Slope floors to drain in all WC				

Functional Area	Functional Unit				
4.00 – STAFF AND SERVICE	**M100 – MECH / ELEC (Minimum 31m²)**				
Overview: A dedicated lockable room for mechanical and electrical services with exterior door access					
Adjacencies: Refer to adjacency diagram					
Finishes Floor Base Walls Ceiling	**Epoxy Flooring** **Epoxy Cove Base** **Painted Gypsum Board** **N/A**				
Ceiling Height Minimum	**Exposed Structure (painted)**				
Millwork					
Equipment Provided By School District:					
Equipment Provided By Design Builder:					
Furniture Provided by School District:					
Plumbing / Gas	FD-1 @ 3 - Refer to Plumbing Fixture Schedules	HD-1 @ 3 - Refer to Plumbing Fixture Schedules	- -	- -	- -
Mechanical	- 2 @ Heavy duty, electric resistance heat, fan assisted heater - 130 w/m2 - Wall mount, vandal proof, temperature sensor (Non-adjustable)	- -	**N/A** Occupant Load	-	- Ordinary hazard (Group 1) occupancy fire protection
Lighting	- Surface wrap/strip	- **Wall switch**	-	- **30 fc**	-
Electrical / Power	- Service entrance equipment / panelboard	- 4 min receptacles	-	-	-
Aux. Systems / Communications – Security	-	-	-	-	-
General Activity	Mechanical and Electrical Services room				
Electrical / Power Notes	• Provide distribution equipment including panelboard • Provide to all other electrical equipment such as security, network, PA etc				

Aux. Systems Communications – Security Notes	• Provide wall mounted network rack for all data outlets and intrusion/CCTV equipment
Special Requirements	• Provide acoustic batt insulation in all interior stud walls • Provide acoustic caulk under all interior wall bottom plates • Acoustic separations between adjacent rooms • Provide fully accessible doors into this space • Provide corner guards at all exterior corners of interior walls • Slope floors to drain in all WC

Exterior Building Envelope

Functional Area		Functional Unit
EXTERIOR BUILDING ENVELOPE		
Overview: The Exterior Building Envelope will consist of multiple different cladding types.		
Adjacencies: N/A		
Walls	Cladding Type 1	Brick course with brick ties
	Cladding Type 2	Aluminum composite metal panels or fibre cement panels: 4 colours
	Cladding Type 3	Wood look metal panels
	Cladding Type 4	Vertical standing seam metal
Roofs	Roof Type 1	2 layer sbs membrane roofing system
	Roof Type 2	Standing seam metal roof

EXTERIOR SITE DESIGN

The proposed site for the new George Pringle Secondary is to receive all trees as required as per the City of West Kelowna latest Zoning Bylaws. Two (2) full size playing fields to be provided; One large playing field (70 yards x 120 yards) and a smaller playing field (55 yards x 120 yards). Both fields are to be placed / run North / South.

The parking lot requires seven (7) bus drop off parking stalls, fifteen (15) drop off parking stalls, raised crosswalks with stamped asphalt, three (3) H/C accessible parking stalls (3900x6000) with the required side access aisles and will include free standing H/C parking stall signage for all the H/C parking. All required parking is to be based on the City of West Kelowna latest Zoning and Off-Street Parking Bylaws.

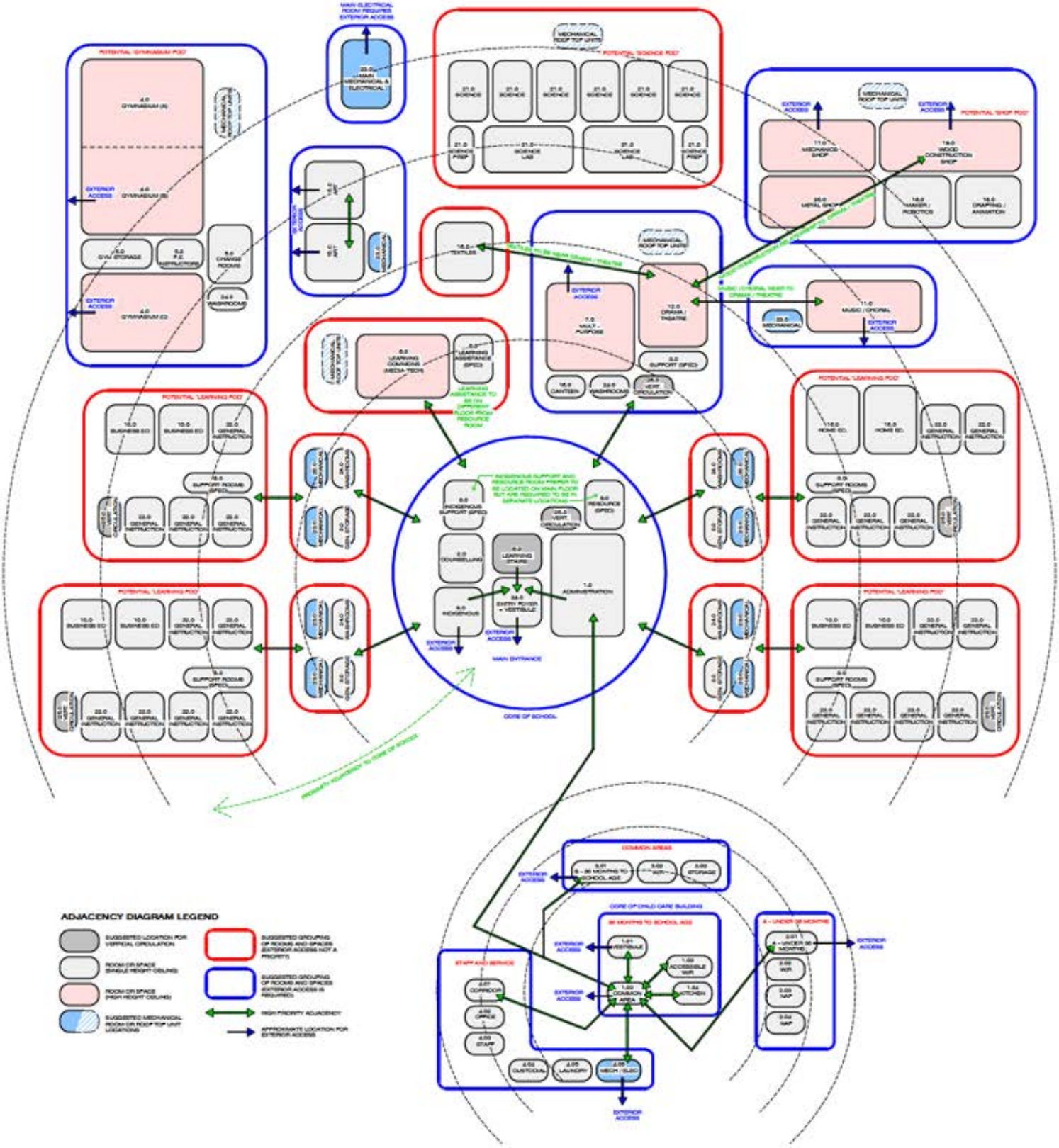
The H/C stall will have a 1200mm wide painted access aisle. Signage to be provided at all crosswalks, three (3) H/C accessible parking stalls clearly indicated with paint and all necessary traffic signs. The H/C accessible paths from the parking lots to both the school and childcare buildings are to be maintained.

In addition, the parking lot will include two hundred and forty (240) regular parking stalls (2750x6000) and twenty (20) small car stalls (2500x5000). The small car stalls will require appropriate painting indicating "small car". A one (1) way drive access with drop off stalls that are separate from the parking lot.

A firetruck access required within 15.0 m of the main entrance of both the school and childcare buildings as per the latest BC Building Code requirements. Landscape islands to be constructed throughout the parking lot. Painted wayfinding arrows to be provide with the access drop off loop coming from the southeast corner of the site of Pineridge Place and connect to the northwest of the site. A direct connection to be provided from the drop off loop to the adjacent site paved parking area.

Concrete rollover curbs are required between the drop off area and the concrete access path to the school main entrance. Three (3) flagpoles to be installed near the main entrance of the school. Within 40m of the west existing on-site fire hydrant construct one (1) freestanding concrete fire hydrant connection. Location to follow the latest BC Building Code requirements. Minimum width of the concrete sidewalks from the parking lot to the main building entrance will be 1500mm. Coloured concrete access pathway from the parking lot to the main entrance is to be provided and to include trees throughout on both sides of walkway. Four (4)

loading stalls, two (2) to be located adjacent to the exterior shop compounds and two (2) located adjacent to the gym.
A concrete amphitheater to be constructed outside of the music room that includes a presentation/band area. Where required by code provide painted steel and stainless-steel handrails. Outside of the building curving seat benches are required. Around the full perimeter of the building there will be a minimum 1500mm sidewalk to the plaza/courtyard at the rear of the building.

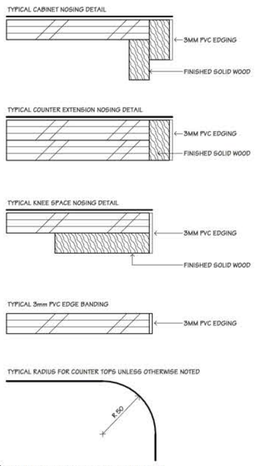

ADJACENCY DIAGRAM LEGEND
SUGGESTED LOCATION FOR VERTICAL CIRCULATION
ROOM OR SPACE (SINGLE HEIGHT CEILING)
ROOM OR SPACE (HIGH HEIGHT CEILING)
SUGGESTED MECHANICAL ROOM OR ROOF TOP UNIT LOCATIONS
SUGGESTED GROUPING OF ROOMS AND SPACES (EXTERIOR ACCESS NOT A PRIORITY)
SUGGESTED GROUPING OF ROOMS AND SPACES (EXTERIOR ACCESS IS REQUIRED)
HIGH PRIORITY ADJACENCY
APPROXIMATE LOCATION FOR EXTERIOR ACCESS
POTENTIAL 'GYMNASIUM POD'
POTENTIAL 'SCIENCE POD'
POTENTIAL 'SHOP POD'
POTENTIAL 'LEARNING POD'
CORE OF SCHOOL
MAIN ENTRANCE
COMMON AREAS
CORE OF CHILD CARE BUILDING
STAFF AND SERVICE

APPENDIX 1B(b)

MILLWORK DETAILS

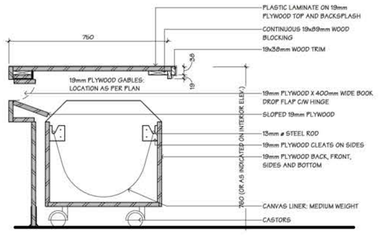
See separate document.

CASEWORK SCHEDULE	
TYPE MARK	COUNT
AL-27	1
AL-28	1
AL-29	1
AL-30	1
AL-31	1
D-7	2
D-7b	2
D-10	14
H-3	13
H-7	4
H-8	9
HC-1	3
HC-2	6
HC-3	6
HC-4	3
HC-5	5
HC-8	2
L-1a	257
L-3a	5
L-5a	6
L-10	3
L-12	12
L-34	27
M-2	4
M-4	11
M-6	2
OS-1	15
U-1	164
U-3	14
U-4	33
U-5	12



1 A10.3 **TYPICAL MILLWORK DETAILS**
1 : 2

NOTE: ALL DOORS AND DRAWERS TO BE LOCKABLE



2 A10.3 **AL-27**
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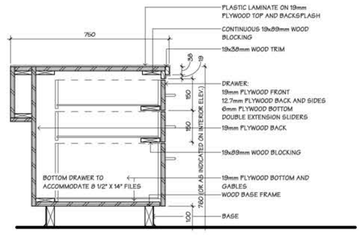

3 A10.3 **AL-28**
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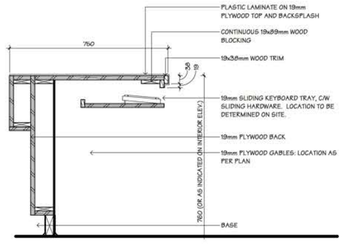

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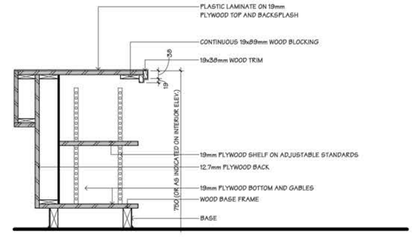

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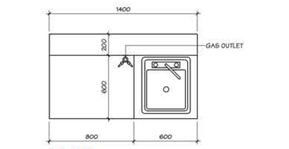
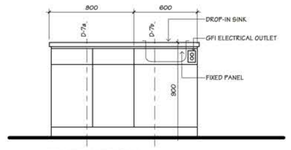
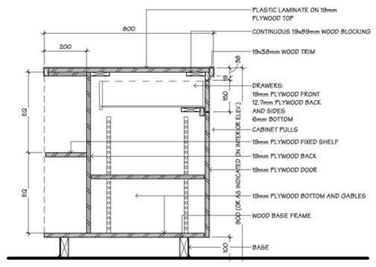


PLAN

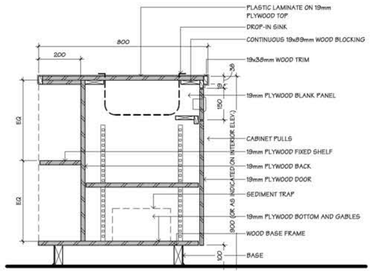


ELEVATION

6 A10.3 **D-7 - SCIENCE DEMONSTRATION TABLE**
1 : 20



7 A10.3 **D-7a - SCIENCE DEMONSTRATION TABLE**
1 : 10



8 A10.3 **D-7b - SCIENCE DEMONSTRATION TABLE**
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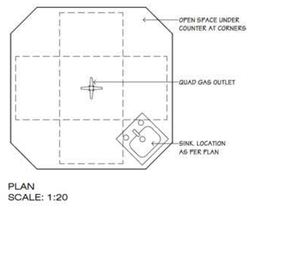
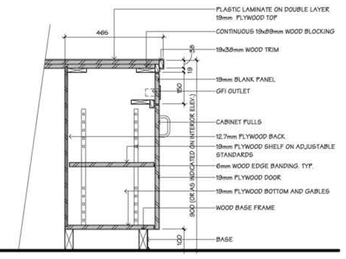


PLAN
SCALE: 1:20

9 A10.3 **D-10 - SCIENCE DEMONSTRATION STATION (STUDENT BASE CABINET) PLAN**
1 : 20



D-10 - SCIENCE DEMONSTRATION STATION (STUDENT BASE CABINET) SECTION

10 A10.3
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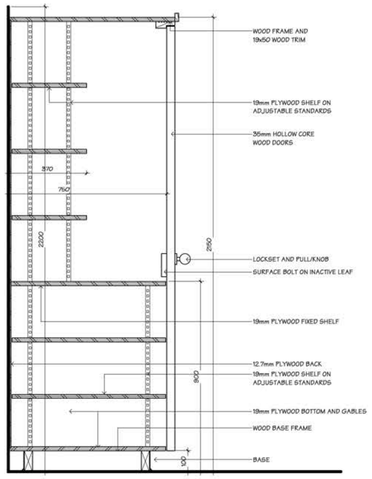
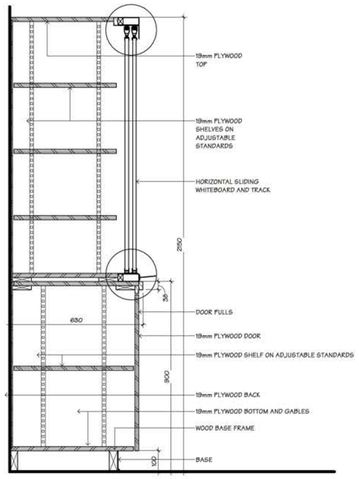
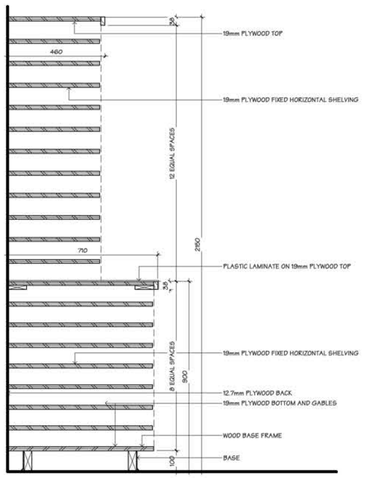


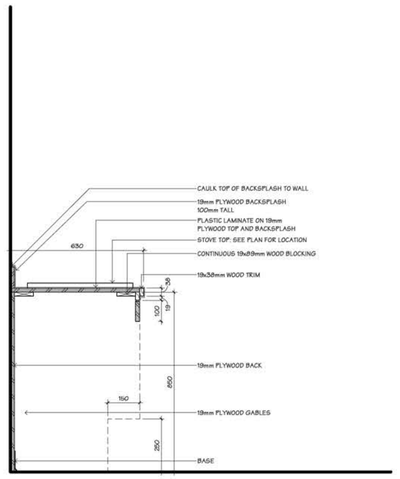
11 A10.3 **H-3 - TEACHER'S CUPBOARD - 2 DOOR**
1 : 10



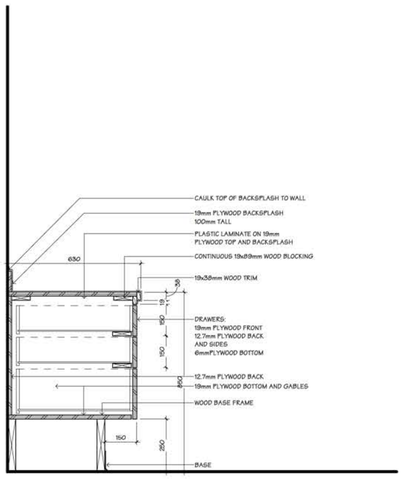
12 A10.3 **H-7 - TEACHING STATION**
1 : 10



13 A10.3 **H-8 - HORIZONTAL PAPER STORAGE**
1 : 10



14 A10.3 **HC-1 - HANDICAPPED COOK STATION COOK TOP**
1 : 10



15 A10.3 **HC-2 - HANDICAPPED COOK STATION DRAWERS**
1 : 10

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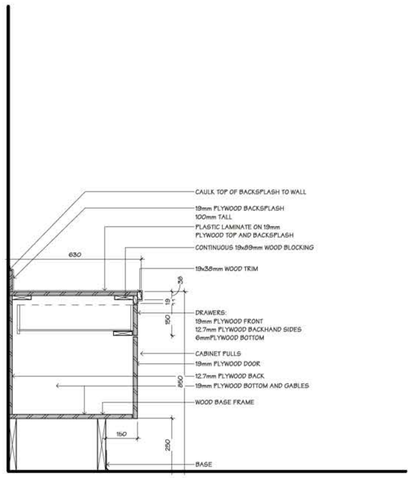
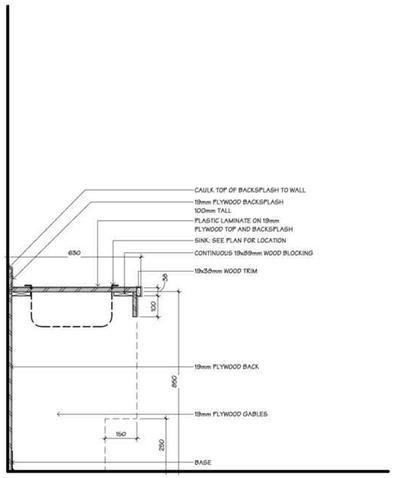
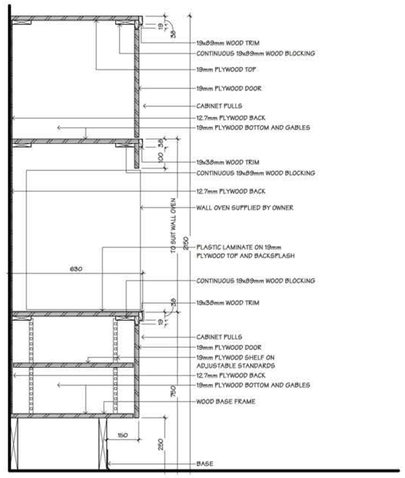


1 A10.4 **HC-3 - HANDICAPPED COOK STATION CABINET**
1 : 10



2 A10.4 **HC-4 - HANDICAPPED COOK STATION SINK**
1 : 10



3 A10.4 **HC-5 - HANDICAPPED COOK STATION WALL OVEN**
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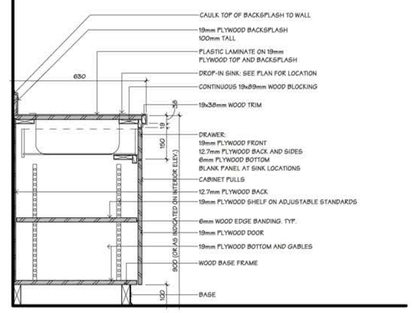
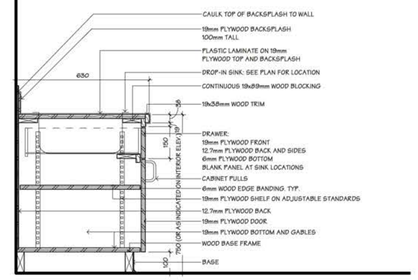
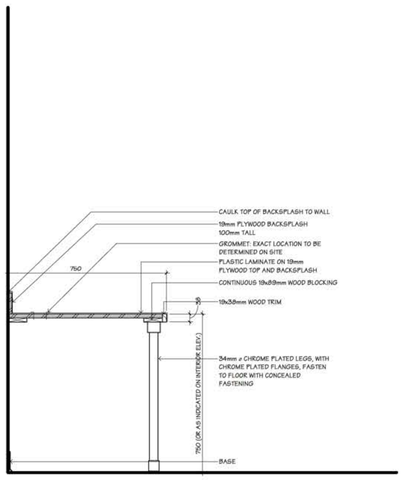


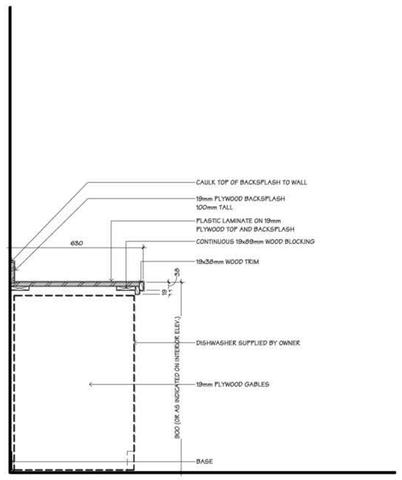
4 A10.4 **L-1a - BASE CABINET - 900mm HEIGHT - 630mm DEPTH**
1 : 10



5 A10.4 **L-3a - BASE CABINET - 750mm HEIGHT - 630mm DEPTH**
1 : 10



6 A10.4 **L-5a - KNEE SPACE - 750mm HEIGHT - 750mm DEPTH**
1 : 10



7 A10.4 **L-10 - DISHWASHER COUNTER**
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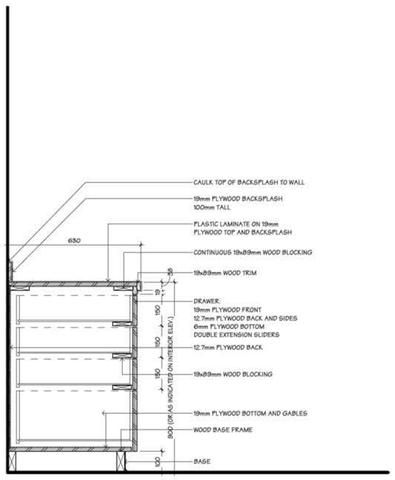
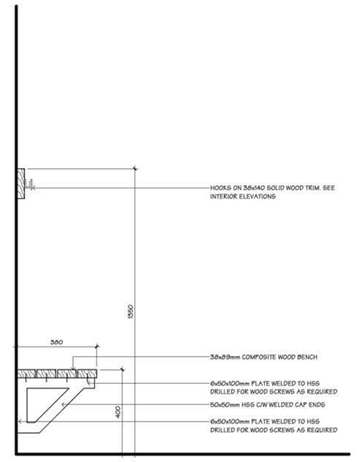
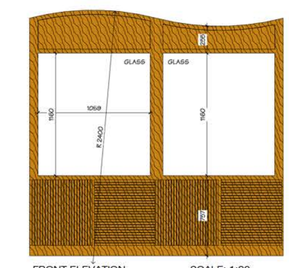


8 A10.4 **L-12 - LOWER DRAWERS (4 DRAWERS)**
1 : 10

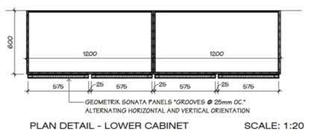
9 A10.4 **M-2 - CHANGE ROOM BENCH - FREESTANDING**
1 : 10



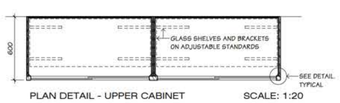
10 A10.4 **M-4 - CHANGE ROOM BENCH AND COAT HOOKS**
1 : 10



FRONT ELEVATION SCALE: 1:20



PLAN DETAIL - LOWER CABINET SCALE: 1:20



PLAN DETAIL - UPPER CABINET SCALE: 1:20

11 A10.4 **M-6 - DISPLAY CABINET (SLOPING TOP) - PLANS**
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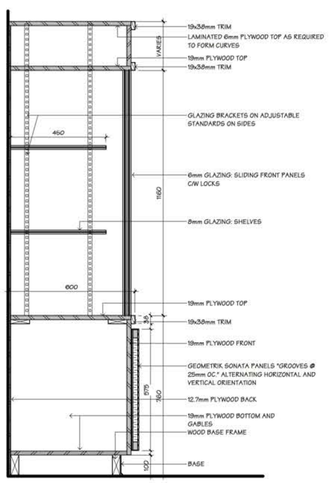

12 A10.4 **M-6 - DISPLAY CABINET (SLOPING TOP) - SECTION**
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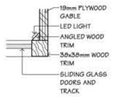
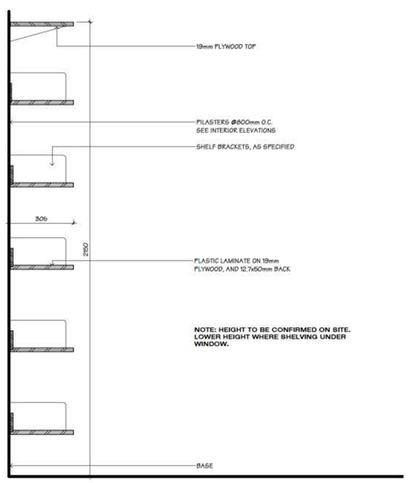


CORNER DETAIL

13 A10.4 **M-6 - DISPLAY CABINET (SLOPING TOP) - DETAIL**
1 : 5



14 A10.4 **OS-1 - ADJUSTABLE SHELVING WALL MOUNTED**
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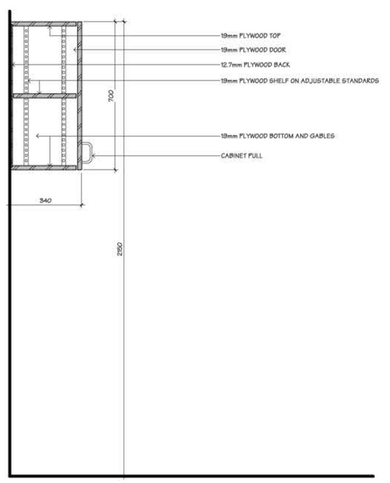

15 A10.4 **U-1 - UPPER CABINET**
1 : 10

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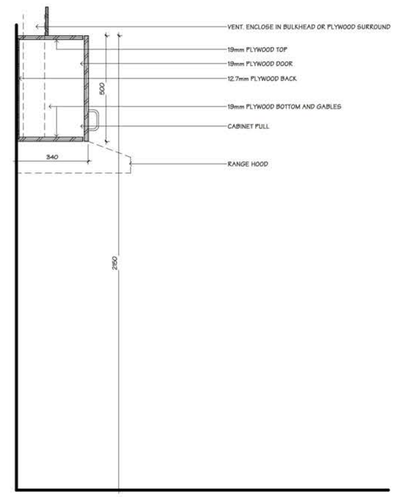

1 A10.5 **U-3 - UPPER CABINET OVER RANGE**
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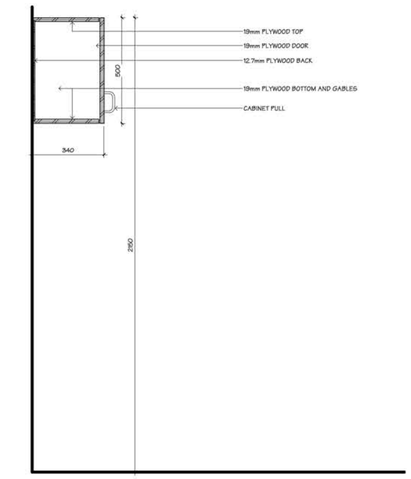
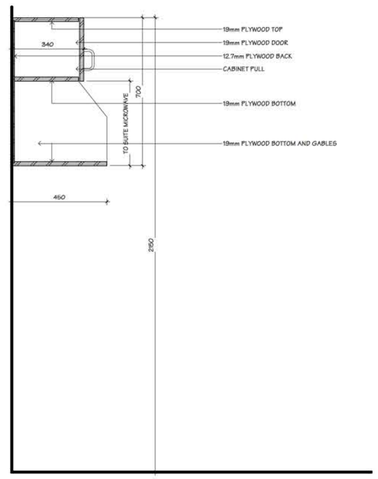
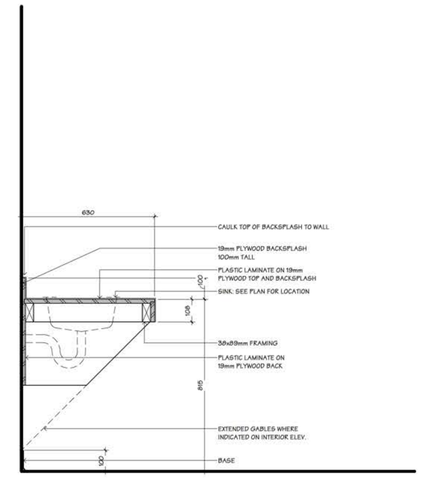


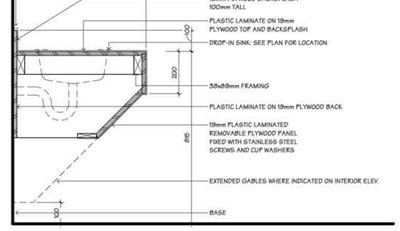
2 A10.5 **U-4 - UPPER CABINET OVER SINK**
1 : 10



3 A10.5 **U-5 - UPPER CABINET MICROWAVE**
1 : 10



4 A10.5 **V-1 - H/C ACCESSIBLE VANITY**
1 : 10



5 A10.5 **V-2 - VANITY**
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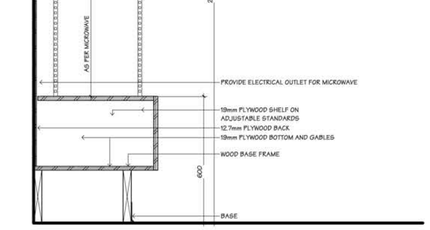
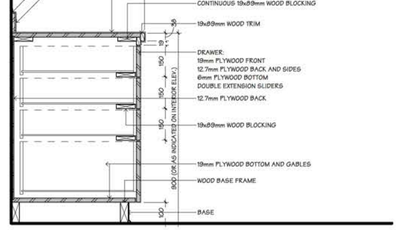


6 A10.5 **HC-8 - HANDICAPPED COOK STATION WALL MICROWAVES**
1 : 10



7 A10.5 **L-34 - LOWER DRAWERS (4 DRAWERS)**
1 : 10

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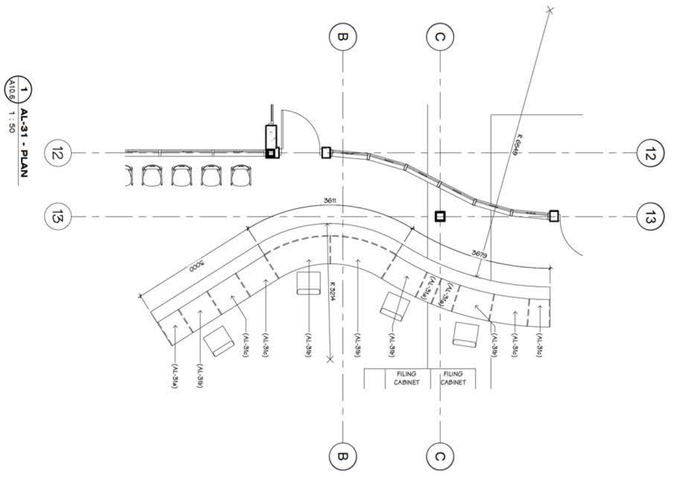
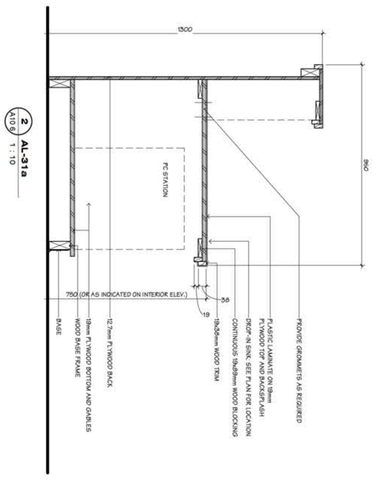


1 A10.6 **AL-31 - PLAN**
1 : 50



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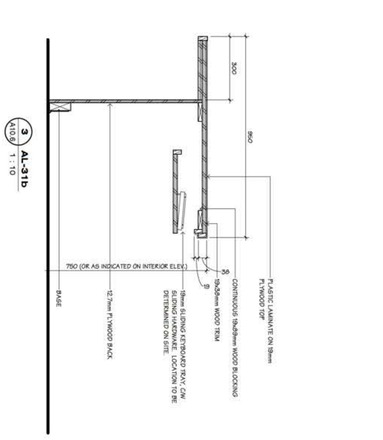

3 A10.6 **AL-31b**
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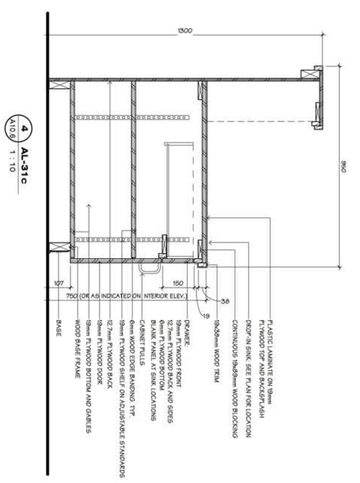

4 A10.6 **AL-31c**
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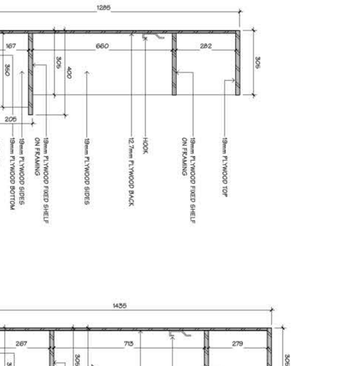

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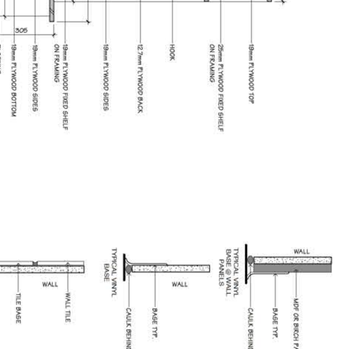
CABINET L-2
1 : 10

CABINET L-2a
1 : 10



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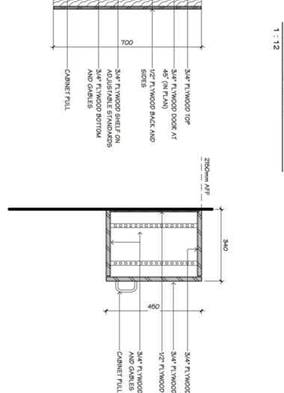
CABINET L-3a
1 : 10

CABINET L-4
1 : 10



M-4 ENTRY HUB
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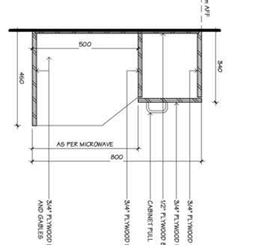

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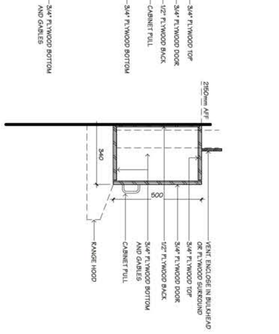
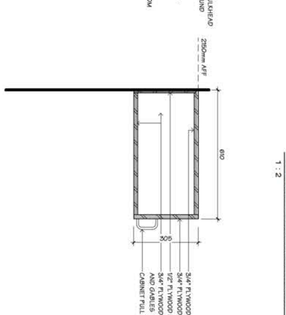
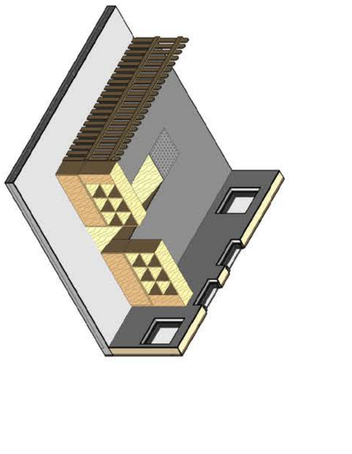
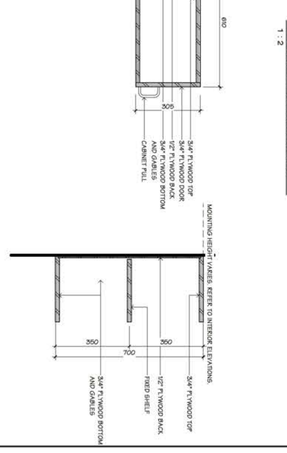




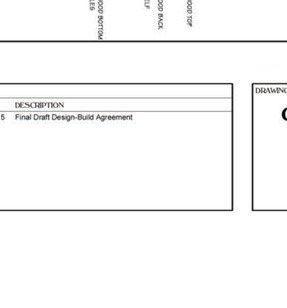
TYPICAL COUNTER DETAILS
1 : 2



UPPER CABINET U-1
1 : 10



UPPER CORNER CABINET U-1a
1 : 10



UPPER CABINET U-2
1 : 10

UPPER CABINET U-3
1 : 10

UPPER CABINET U-4
1 : 10

UPPER CABINET U-5
1 : 10

UPPER CABINET U-6
1 : 10

M-1 CUBBIES
1 : 10

M-2 CUBBIES
1 : 10

TYPICAL WALL BASE DETAILS
1 : 5

3D VIEW FOR REFERENCE ONLY

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A10.0

DRAWING NAME: **MILLWORK**

JOB NO. 22007
SCALE As indicated
DATE 2022.09.20

REVISIONS

NO.	DATE	DESCRIPTION
	2023.09.15	Final Draft Design-Build Agreement

DRAWING NAME:
GEORGE PRINGLE SECONDARY CHILDCARE BUILDING
3770 ELLIOT ROAD, WEST KELOWNA, B.C.

APPENDIX 1C

ACOUSTICAL CHART

See separate document.

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APPENDIX 1C – ACOUSTICAL CHART

1. DEFINITION AND ACRONYMS

    a. "NC" means Noise Criteria. NC is a single number rating that is sensitive to the relative loudness within a given space at different frequencies and is most commonly used to evaluate the level of speech interference caused by noise from mechanical systems
    b. "STC" means (Laboratory) Sound Transmission Class. STC is a single number that is an indication of an assembly's ability to block sound in the speech frequencies. The higher the STC rating, the higher is the sound transmission loss. For instance: Loud speech can be understood fairly well through a STC 30 wall but should not be audible through an STC 60 wall.
    c. "RT60" means reverberation time. It is defined as the time it takes for a sound to decay by 60 dB within a space

2. Design Principles:

    a. Design and install all mechanical systems to prevent sound vibration transmission between spaces, and transmission from mechanical equipment to the spaces. Provide sound attenuation to limit sound levels according to Figure A-1 and Figure A-2. Design and install mechanical systems located at or near any exterior wall / roof to minimize sound transmission to the neighbouring community using barriers to interrupt noise paths. Acceptable sound levels to be below requirements of local noise ordinances or other government codes, or in absence of governing noise ordinance, 55dBA during the day or 45dBA at night measured from best representative locations on neighboring properties where noise disturbance would be perceived, whichever is lower."
    b. Provide vibration isolation devices on all equipment with rotating components
    c. All hung equipment will utilize spring isolators designed for the weight and vibration characteristics of the equipment
    d. Provide flexible connections where needed to isolate mechanical equipment sound and vibration from ducting, piping, and electrical wiring systems
    e. All walls and partition STC ratings are to extend to the underside of structure above, and to the floor level complete with continuous acoustic caulking under the bottom wall plate
    f. All doors and windows in walls that require STC ratings shall be acoustically rated

g. Penetrations of sound isolating partition walls shall be sealed and maintain STC ratings

3. Performance Criteria:

a. Ensure duct silencers meet or exceed the requirements of the ductwork for cleanliness and inspection
b. Utilize fibre free internal insulation
c. Prior to completing the Design, provide an acoustical consultant's report demonstrating that the specified acoustical performance criteria will be met
d. HVAC, plumbing and electrical systems will not exceed the noise criterion (NC) specified in Figure A-1
e. Provide room shapes, furniture configurations, and sound absorptive materials and finishes such that RT60 do not exceed the values listed in Figure A-3
f. Operable wall partitions will be selected to meet the minimum rating listed in Figure A-2

Figure A-1 – Mechanical and Electrical Noise Criterion (NC)

SPACE TYPE	NOISE CRITERION – NC
Drama Rooms	20-25
Music Rooms	30-35
Sensory Rooms	20-25
Classrooms	30-35
Recordings / Composition Rooms	20-25
Audio Recording Rooms	20-25

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Figure A-2 – Wall STC Requirements

SPACE TYPE	CLASSROOM	RADIO, A/V	MUSIC	THEATRE	GYMNASIUM, FITNESS	PRIVATE OFFICE, MEETING	COUNSELLING	KITCHEN	WASHROOM	MECHANICAL, ELECTRICAL
CLASSROOM	50[1]									
RADIO, A/V	60[3]	60[3]								
MUSIC	65[3]	65[3]	65[3]							
THEATRE	55[2]	60[3]	65[3]	55[2]						
GYMNASIUM, FITNESS	60[3]	60[3]	65[3]	60[3]	60[3]					
PRIVATE OFFICE, MEETING	50	60[3]	65[3]	55[2]	60[3]	45				
COUNSELLING	55[2]	60[3]	65[3]	55[2]	60[3]	55[2]	55[2]			
KITCHEN	60[3]	60[3]	65[3]	55[2]	60[3]	60[3]	60[3]	45		
WASHROOM	65[3]	65[3]	65[3]	65[3]	65[3]	65[3]	65[3]	55	55[2]	N/A
MECHANICAL, ELECTRICAL	45	50	45	50	45	45	50	45	45	50

[1] Classroom Partition walls will be an assembly designed to STC designed to 51.
[2] Where an STC 55 separation is required the wall construction will be an assembly STC designed to 58.
[3] Where an STC 60 or 65 separation is required, the wall construction will be an assembly STC designed to 68.

Composite concrete topping on steel decking STC to be minimum 50. Concrete suspended slab STC to be minimum 50.

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Figure A-3 – Reverberation Time RT60 Requirements For Space Types

SPACE TYPE	MAXIMUM RT60 (s)
Classroom / Learning Studio < 283 m^3	0.6
Classroom / Learning Studio > 283 m^3	0.7
Radio, A/V, Video Conferencing	0.5
Music Learning Studio	0.6-0.8
Theatre Learning Studio	1.0-1.2
Gymnasium, Fitness	1.0
Office, Meeting, Counselling, Support	0.6
Kitchen	0.8
Education Commons	0.9-1.1
Community Commons	1.0-1.2
Mechanical, Electrical	0.8
Corridor, Lobby, Staircase	1.0

APPENDIX 1D

SYSTEMS RESPONSIBILITY MATRIX

See separate document.

SOR SECTION	SOR SECTION HEADING	NETWORK CONNECTIVITY	INFRASTRUCTURE		ACTIVE COMPONENTS						
			DESIGN & SPECIFY	PROCURE, INSTALL & WARRANTY	TESTING	SPECIFY	PROCURE	INSTALL	SYSTEM PROGRAMMING	INTEGRATION	SYSTEM COMMISSIONING
8.1	**DIVISION 21 - FIRE SUPPRESSION**										
8.1.1	FIRE PROTECTION		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.2	**DIVISION 22 - PLUMBING**										
8.2.1.3	SANITARY DRAINAGE SYSTEM		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.2.1.4	COMPRESSED AIR SYSTEMS		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.2.1.5	GAS PIPING SYSTEMS		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.2.2	REDUNDANCY - PLUMBING EQUIPMENT		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.2.3	FLOOR DRAINAGE, WATER CONTAINMENT:		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.2.4	PLUMBING FIXTURES		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.2.5	DOMESTIC HOT WATER		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.3	**DIVISION 23 - HEATING, VENTILATION AND AIR CONDITIONING**										
8.3.1	GENERAL HVAC		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.3.2	HEATING		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.3.3	AIR CONDITIONING		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.3.4	VENTILATION		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.3.5	EXHAUST SYSTEMS		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.3.6	NOISE AND VIBRATION		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.3.7	COMMISSIONING OF MECHANICAL SYSTEMS		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.4	**BUILDING MANAGEMENT SYSTEM**		**DESIGN-BUILDER**	**DESIGN-BUILDER**	**DESIGN-BUILD**	**DESIGN-BUILD**	**DESIGN-BUILD**	**DESIGN-BUILD**	**DESIGN-BUILDER**	**DESIGN-BUILDI**	**DESIGN-BUILDER**
8.5	**DIVISION 26 - ELECTRICAL**										
8.5.2	LOAD CLASSIFICATION AND IDENTIFICATION		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.5.3	ELECTRICAL AND UTILITY SERVICES		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.5.4	SEISMIC REQUIREMENTS FOR ELECTRICAL SYSTEMS		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.5.5	GROUNDING AND BONDING		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.5.6	POWER QUALITY		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.5.7	EMERGENCY POWER		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.5.8	UNINTERRUPTIBLE POWER SUPPLY		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
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8.5.10	SERVICE ROOMS		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
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8.5.12	WIRING METHODS AND MATERIALS		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
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8.5.15	LUMINAIRE CONSTRUCTION AND LIGHTING COMPONENTS		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
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8.5.18	EXIT LIGHTS		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
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8.5.25	EV CHARGING		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.5.26	RENEWABLE ENERGY		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.5.27	OPERATING AND MAINTENANCE INSTRUCTIONS		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.5.28	COMMISSIONING		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.6	**DIVISION 27 - COMMUNICATIONS**										
8.6.2	STRUCTURED CABLING SYSTEM		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.6.3	TELECOMMUNICATIONS RACKS AND CABINETS		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.6.4	COMMUNICATIONS ROOM		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.6.5	REDUNDANCY OF PATHWAYS AND SPACES		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.6.6	FIBRE BACKBONE		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.6.7	COPPER BACKBONE		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.6.8	HORIZONTAL CABLE		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.6.9	BONDING		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.6.10	TELECOMMUNICATIONS OUTLETS		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.6.11	UNINTERRUPTABLE POWER SUPPLY (UPS)		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.6.12	WIRELESS INFRASTRUCTURE		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.6.13	NETWORK EQUIPMENT		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.6.14	AUDIO VISUAL SYSTEMS		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.6.15	THEATRE SOUND SYSTEM		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.6.16	VIDEO CONFERENCING SYSTEMS		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.6.17	INTEGRATION REQUIREMENTS		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.6.18	TELEPHONE EQUIPMENT		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.6.19	PUBLIC ADDRESS (PA)		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.7	**DIVISION 28 - ELECTRICAL SAFETY & SECURITY**										
8.7.1	INTRUSION DETECTION		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.7.2	ACCESS CONTROL		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.7.3	VIDEO SURVEILLANCE (CCTV)		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.7.4	PANIC DURESS		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER
8.7.5	INTERCOMMUNICATION SYSTEM		DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER	DESIGN-BUILDER

APPENDIX 1E

NOT USED

APPENDIX 1F

EQUIPMENT LISTS

See separate document.

APPLIANCE LIST

Category A Supplied and installed by Design Builder
Category B Supplied by Owner and installed by Design Builder
Category C Supplied and installed by Owner

FUNCTION	ROOM #	ROOM NAME	Furniture/ Equipment Name	Category	Quantity	Type	Specification	Representative Model
ADMINISTRATION								
	1.14	STAFF ROOM						
			Refrigerators	A	2	AP	33" Wide Top-Freezer Refrigerator with Optional EZ Connect Icemaker Kit	Whirlpool WRT541SZDZ
			Microwaves	A	3	AP	2.0 cu. ft. Countertop Microwave with Smart Inverter and EasyClean®	LG NeoChef™ LMC2075ST
			Range	A	1	AP	4.8 Cu. Ft. Freestanding Electric Range	Whirlpool WFC310S0ES
			Dishwasher	A	1	AP	Undercounter Dishwasher with SS TUB, 50dB, 5 Cylces, SS Finish	Whirlpool WDF560SAFM
GYM ANCILLARY								
	5.09	PE INSTRUCTORS						
			Stackable Washer and Dryer	A	1		Electric Washer/Dryer Laundry Center - 4.3 Cu. ft Washer and 5.6 Cu. ft. Dryer,	Frigidaire FLCE752CAW
HOME ECONOMICS								
	16.01	TEXTILES						
			Stackable Washer and Dryer	A	1	AP	Electric Washer/Dryer Laundry Center - 4.3 Cu. ft Washer and 5.6 Cu. ft. Dryer,	Frigidaire FLCE752CAW
	16.03	CANTEEN						
			Refrigerators	A	1	AP	33" Wide Top-Freezer Refrigerator with Optional EZ Connect Icemaker Kit	Whirlpool® WRT541SZDZ
			Freezer	A	1	AP	20.2 Cu. Ft. Upright Freezer	Frigidaire FFFH20F2QW
			Electric Convection Oven	A	1	AP	Double Full Size Electric Convection Oven - 20.8 kW, 240v/3ph	Garland Canada SUME-200
			Microwave	A	2	AP	2.0 cu. ft. Countertop Microwave with Smart Inverter and EasyClean®	LG NeoChef™ LMC2075ST
			Dishwasher	A	1	AP	High Temperature 25 Racks / Hour Undercounter Dishwasher With 70 Degree Rise Booster	Champion Moyer, Diebel Canada, 501HT(70)
			Refrigerator Merchandiser	A	1	AP	54” 2 Sliding Door Glass Refrigerator Merchandiser	True Canada GDM-47-HC-LD
			Reach-In Cooler	A	1	AP	54" Bottom Mount Reach in Cooler	EFI-C2-54VC
			Reach-In Freezer	A	1	AP	One Section Reach In Freezer	True Canada T-23F-HC

APPLIANCE LIST

Category A Supplied and installed by Design Builder
Category B Supplied by Owner and installed by Design Builder
Category C Supplied and installed by Owner

FUNCTION	ROOM #	ROOM NAME	Furniture/ Equipment Name	Category	Quantity	Type	Specification	Representative Model
			Hot Dog Grill	A	1	AP	Hot Dog Roller Grill w/Bun Storage - Slanted Top, 120v	Star 50SCBBC
			Warming Drawer, Free Standing	A	1	AP	Each drawer to have recessed individual thermostatic control, temperature monitor, and On/Off switch Heavy-duty drawer slides with nylon rollers and adjustable sliding vents on each.	Hatco Canada HDW-2
			Hot Water Dispenser	A	1	AP	Two burner Hot Water Machine - 120V, 8.6 amp, 1040 watt	BUNN 02550.0003
			Coffee Brewer	A	1	AP	Coffee Brewer with Airpots, w/ 3 4/5 gal/hr Capacity	Bunn CW-15APS
	16.05	HOME ECONOMICS						
	16.04	HOME ECONOMICS						
		TOTAL NUMBER OF MODULE: 2						
		PROVIDE FOR EACH MODULE X 2						
			Refrigerators	A	1	AP	33" Wide Top-Freezer Refrigerator with Optional EZ Connect Icemaker Kit	Whirlpool WRT541SZDZ
			Microwave	A	8	AP	2.0 cu. ft. Countertop Microwave with Smart Inverter and EasyClean®	LG NeoChef™ LMC2075ST
			Cooktop	A	2	AP	30'' Electric Cooktop,	Frigidaire FFEC3024LB
			Range	A	5	AP	4.8 Cu. Ft. Freestanding Electric Range	Whirlpool WFC310S0ES
			Wall Ovens	A	2	AP	27'' Single Electric Wall Oven	Frigidaire FGEW276SPF
			Dishwahser	A	1	AP	Undercounter Dishwasher with SS TUB, 50dB, 5 Cylces, SS Finish:	Whirlpool WDF560SAFM
				A				
			Cooktop	A	1	AP	30" Induction Cooktop	Whirlpool WCI55US0JB
	16.06	HOME EC. STORAGE						
			Fridge	A	2	AP	33" Wide Top-Freezer Refrigerator with Optional EZ Connect Icemaker Kit 21 cu ft	Whirlpool® WRT541SZDZ
			Freezer	A	2	AP	20.2 Cu. Ft. Upright Freezer	Frigidaire FFFH20F2QW
			Stackable Washer and Dryer	A	1	AP	Electric Washer/Dryer Laundry Center - 4.3 Cu. ft Washer and 5.6 Cu. ft. Dryer,	Frigidaire FLCE752CAW
MULTI-PURPOSE								
	7.01	MULTI-PURPOSE						
			Refrigerators	A	1	AP	33" Wide Top-Freezer Refrigerator with Optional EZ Connect Icemaker Kit	Whirlpool WRT541SZDZ

APPLIANCE LIST

Category A Supplied and installed by Design Builder
Category B Supplied by Owner and installed by Design Builder
Category C Supplied and installed by Owner

FUNCTION	ROOM #	ROOM NAME	Furniture/ Equipment Name	Category	Quantity	Type	Specification	Representative Model
SCIENCE								
	21.14	SCIENCE PREP						
		TOTAL NUMBER OF MODULE: 2						
		PROVIDE FOR EACH MODULE X 2						
			Refrigerators	A	2	AP	33" Wide Top-Freezer Refrigerator with Optional EZ Connect Icemaker Kit	Whirlpool WRT541SZDZ
SPECIAL EDUCATION								
	8.10	RESOURCE						
			Microwaves	A	2	AP	2.0 cu. ft. Countertop Microwave with Smart Inverter and	LG NeoChef™ LMC2075ST
			Range	A	1	AP	4.8 Cu. Ft. Freestanding Electric Range	Whirlpool WFC310S0ES
			Dishwasher	A	1	AP	4.8 Cu. Ft. Freestanding Electric Range	Whirlpool WDF560SAFM
NLC (CHILDCARE)								
		NLC (CHILDCARE)						
			Refrigerators	A	1	AP	30" WIDE TOP-FREEZER REFRIGERATOR WITH FLEXI-SLIDE™ BIN	Whirlpool WRT318FZDW
			Microwave	A	4	AP	Countertop Microwave, 1.6 cu. ft. Capacity, 1200W Watts, 20" Exterior Width, Stainless Steel colour Genius Cyclonic Inverter	Panasonic NN-SD765S
			Range	A	1	AP	4.8 Cu. Ft. Freestanding Electric Range	Whirlpool WFC310S0ES
			Dishwahser	A	1	AP	Undercounter Dishwasher with SS TUB, 50dB, 5 Cylces, SS Finish:	Whirlpool WDF560SAFM
			Stackable Washer and Dryer	A	1	AP	Electric Washer/Dryer Laundry Center - 4.3 Cu. ft Washer and 5.6 Cu. ft. Dryer,	Frigidaire FLCE752CAW

SHOP EQUIPMENT LISTS

Category	**A**	**Supplied and installed by Design Builder**
Category	**B**	**Supplied by Owner and installed by Design Builder**
Category	**C**	**Supplied and installed by Owner**

FUNCTION	ROOM #	ROOM NAME	Furniture/Equipment Name	Category	Quantity	Type	Specification	Representative Model
INDUSTRIAL EDUCATION								
	17.01	MECHANICS SHOP						
			Wireless Access Point Device	B	1	E&T		
			Phone	C	1	E&T		
			2 Post 45 Post Hoist/Lift	A	1	SHOP	10,000-lb Capacity, Asymmetric Clearfloor, Adjustable Width, Screw Pads, Wide or narrow drive-thru configuration, with overhead safety shutoff bar	XPR-10AS
			4 Post Hoist/Lift	A	1	SHOP	14,000 POUND CAPACITY, COMMERCIAL GRADE FOUR POST AUTO / TRUCK LIFT	HDS-14X
			Air Compressor	A	1	SHOP	15 hp ROTARY SCREW TANK MOUNT AIR COMPRESSOR, 57 SCFM — 145 PSI (Intent is to have one centrally located compressor to meet all shops requirements)	C15TVSD 200/208-60-3
			Air Compressor System Dryer	A	1	SHOP	60CFM REFR. AIR DRYER equipped with a 2-stage heat-exchanger	ASD60
			Battery Chargers	A	2	SHOP	6V/12V, 2/20/60/250A Commercial Battery Charger	K3150
			Bench Grinder	A	1	SHOP	Bench Grinder	GRINDER - BENCHTOP MODEL, 8", BAL-8107W with base GA20
			Brake Lathe	A	1	SHOP	Combination Disc/Drum Brake Lathe with Bench & Standard Tooling	Ranger RL-8500
			Buffer	A	1	SHOP	3HP, 1500/1800RPM, 3PH, 50/60HZ, 3628M, BUFF with stan GA20	1252 + GA20
			Ceiling Power Cords	A	4	SHOP	Industrial Cord Reel - 15A	H-7121
			Computer Code Analyzer	A	1	SHOP	Eliten Reset OBD2 Scanner Diagnostic Tool	CRP123X
			Cut Off Saw	A	1	SHOP	5" X 6" DUAL SWIVEL METAL CUTTING BANDSAW	KC-129DS
			Diagnostic Scanner	A	1	SHOP	Snap-On ZEUS with Intelligent Diagnostics	ZEEMS342A
			Disc Sander	A	1	SHOP	Combination 6" x 48" belt sanderand 12" disc sander	15-035DC
			Drill Press	A	1	SHOP	22 inch Drill Press	General International 75-500
			Engine Lift	A	1	SHOP	3-Ton Hydraulic Engine Hoist	Strongarm Model no. 218
			Flammable Storage Cabinet	A	1	SHOP	45 Gallon Flammable Storage Cabinet	Justrite H-1564M
			Hydraulic Jack (6 Ton)	A	2	SHOP	6 Ton Floor Jack	OTC No.5206
			Industrial Parts Washer	A	1	SHOP	WASHER BIOMATIC PARTS	Graymills PH922A
			Jack Stand Sets	A	2	SHOP	Gray, Titan 10 ton Vehicle Stands	Grainger WWG11N150
			MIG Welder	A	1	SHOP	Mig Welder with 15 ft. (4.6 m), 250-amp MDX™-250 MIG gun	MillerMatic 252
			Overhead Exhaust System	A	2	SHOP	FAN 1/2HP, 110/1/60 WALL BRACKET 1 - 3"X25FT RUBBER HOSE 1 HOSE SLING 1 NOZZLE/ADAPTER 1 EXHAUST HOSE 12.5FT ON/OFF SWITCH BACK DRAFT DAMPER	KSES
			Sand Blaster	A	1	SHOP	Professional Sandblast Cabinet	Mod-U-Blast E3624DC
			Shop Wash Sink, Soap, Paper Towel, Degrease	A	1	SHOP	Washfountain, Terreon, Semi-Circular 54", B Drain	Bradley WF2504-B-STD-F-TMA-LSD
			Tire Changer	A	1	SHOP	Touchless Tire Changer with service range on 13” – 30” rim diameters that are up to 15” wide	RV1 - 5140138
			Valve Grinding Portable Station	A	1	SHOP	PEG Valve Refacer	RV3000
			Wall Mounted Classroom 75 inch TV	A	1	E&T	Standard Classroom TV projection	
			WASTE OIL TANK	A	1	SHOP	ULC listed waste oil tank with minimum capacity of 1135 L (250 Gal)	R1100 RECYCoil Tank
			Wheel Alignment Machine	A	1	SHOP	IMAGING DIAGNOSTIC WHEEL ALIGNMENT SYSTEM	V2180
			Wheel Balancer	A	1	SHOP	Wheel Balancer / 3D Quick-Touch™ Laser-Spot™ / 40 mm Shaft	Is42b
			Work Tables With Stools And Metal Work Vice Included on each corner	A	8	SHOP	Frame for Steel top Workbench, no castors, 36" x60" x 2" Need more information before determining suitability Bench Top must extend width of the Metal work vise +1" (8" HD Metal working vise)	
	17.02	STORAGE (SHOPS)						
			Chemical Storage Cabinets	A	1		Standard Flammable Storage Cabinet - Manual Doors, 90 Gallon	H 2219
			Flammable Cabinet	A	1		45 Gallon Flammable Storage Cabinet	Justrite H-1564M
			Tool Boards	A	4		48" X 24" Poly Pegboard	H-7791
	18.01	TECHNOLOGY (ROBOTICS)						
			Computer Stations	C	1	E&T		
			Computer Monitors	C	1	E&T		
			Wireless Access Point Device	B	1	E&T		
			Phone	B	1	E&T		
			Wall Mounted Classroom 75 inch TV	A	1	E&T		
			External Speakers Or Soundbar	A	1	SHOP		
			Bar Shear	A	1	SHOP	3-IN-1 SHEAR BRAKE ROLL MACHINE	Baileigh SBR-4020
			Bench Grinder	A	1	SHOP	Bench Grinder	GRINDER - BENCHTOP MODEL, 8", BAL-8107W with base GA20
			Benches	A	8	SHOP	Work benches, 2" Butcher block wood top, 36" x 60" x 2"	p/n SHP-TENNSCO model G-MT-3660W-L
			Buffer	A	1	SHOP	1252 3HP with stan GA20	Baldor 1252 + GA20
			Burn Out Oven	A	1	SHOP	Multi-Stage Programmable Burnout Oven-Kiln-120V	Neycraft Vulcan 3-550
			Ceiling Power Cords	A	8	SHOP	Industrial Cord Reel - 15A	Reelcraft H-7121
			Cut Off Saw	A	1	SHOP	5" X 6" DUAL SWIVEL METAL CUTTING BANDSAW	King KC-129DS

SHOP EQUIPMENT LISTS

Category	**A**	**Supplied and installed by Design Builder**
Category	**B**	**Supplied by Owner and installed by Design Builder**
Category	**C**	**Supplied and installed by Owner**

FUNCTION	ROOM #	ROOM NAME	Furniture/Equipment Name	Category	Quantity	Type	Specification	Representative Model
			Drill Press	A	2	SHOP	22 inch Drill Press	General International 75-500
			Foot Shear	A	1	SHOP	See 3 in 1 above	
			Forge	A	1	SHOP	Two burner, single control with stainless steel burner tips, 110 Volt AC blower Weight: 85 lbs	MightyForge Mighty Heavy Duty
			Shop Wash Sink, Soap, Paper Towel, Degrease	A	1	SHOP	Washfountain, Terreon, Semi-Circular 54", B Drain	Bradley WF2504-B-STD-F-TMA-LSD
	18.02	DRAFTING						
			Computer Stations	C	27	E&T		
			Computer Monitors	C	27	E&T		
			Wireless Access Point Device	B	1	E&T		
			Phone	C	1	E&T		
			Wall Mounted Classroom 75 inch TV	A	1	E&T		
			Tool Boards	A	1	SHOP	48" X 24" Poly Pegboard	H-7791
			Benches	A	12	SHOP	Work benches, 2" Butcher block wood top, 36" x 60" x 2" p/n	SHP-TENNSCO model G-MT-3660W-L
	19.01	WOOD CONSTRUCTION						
			Wireless Access Point Device	B	1	E&T		
			Phone	C	1	E&T		
			Shop Wash Sink, Soap, Paper Towel, Degrease	A	1	SHOP	Washfountain, Terreon, Semi-Circular 54", B Drain	Bradley WF2504-B-STD-F-TMA-LSD
			Wall Mounted Classroom 75 inch TV	A	1	E&T		
			External Speakers Or Soundbar	A	1	SHOP		
			Band Saw	A	1	SHOP	SAW - BAND, 15", 1hp, 208v, 3ph;	CWI-B1512
			Band Saw	A	1	SHOP	SAW - BAND, 20", 3hp, 220v, 1ph; CWI-B2013	CWI-B2013
			Ceiling Power Cords	A	8	SHOP	Industrial Cord Reel - 15A	Reelcraft H-7121
			Cnc Milling Machine	A	1	SHOP	CNC, Cutter, with wood cutting bits IE2015XC	ICONIC IE12015XC
			Disc Sander	A	1	SHOP	Belt/Disc Sander	General International 15-035DC
			Drill Press	A	2	SHOP	22 inch Drill Press	General International 75-500
			Jointer	A	1	SHOP	JOINTER - with Helical Cutter heads. DELUXE, carbide, 8";	Magnum MI-81360
			Miter Saw	A	1	SHOP	Sliding MITRE SAW, 12" dual angle compound	DEWALT DWS 709
			Router	A	1	SHOP	ROUTER TABLE - cast iron table with LIFT, p/n MI-42150 steel cabinet	Magnum MI-42150
			Sander	A	1	SHOP	SANDER - OSCILLATING VERTICAL EDGE BELT, 6" X 108"	Magnum MI-16500
			Spindle Sander	A	1	SHOP	SANDER - SPINDLE, OSCILLATING, Floor mount	Magnum MI-16150
			Table Saw	A	2	SHOP	Table Saw, 10", 5HP, 230V, 3PH; Over-arm Dust Collection Assembly, Y-Port unites above and below-table dust collection into one 4" port;	SAW-ICS53230, SAW-TSAODC
			Scroll Saw	A	2	SHOP	20 in. Variable-Speed Scroll Saw with stand	DW788, DW7880 Stand
			Thickness Planer	A	1	SHOP	PLANER - THICKNESS, with Helical cutter head, 20"	Magnum MI-31553
			Wood Lathe	A	4	SHOP	Lathe- 1PH / 1HP / 220volt 68" X 128" TABLE	ONEWAY #2036SD
			Wood Working Vise	A	32	SHOP	Vises, Wood Working 8", extended top, overhang outside of table legs	8 inch HD wood vice
			Work Tables With Stools And Wood Working Vice Included on each corner	A	8	SHOP	Frame for wood top Workbench, no castors, 36" x60" x 2"	
			Tool Boards	A	4	SHOP	48" X 24" Poly Pegboard	H-7791
	19.02	TOOLS (WOOD)						
			Bench Grinder	A	1	SHOP	GRINDER - BENCHTOP MODEL, 8", BAL-8107W with base GA20	8107W + GA20
	19.03	FINISHING (WOOD)						
			Chemical Storage Cabinets	A	1	SHOP	Standard Flammable Storage Cabinet - Manual Doors, 90 Gallon	H 2219
			Flammable Cabinet	A	1	SHOP	45 Gallon Flammable Storage Cabinet	Justrite H-1564M
			Tool Boards	A	1	SHOP	48" X 24" Poly Pegboard	H-7791
	19.04	OFFICE (WOOD)						
			Corner Desk	C	1	FR		
			Administrative Office Chair	C	1	FR		
			Computer Stations	C	1	FR		
			Computer Monitors	C	1	FR		
			Phone	C	1	E&T		

SHOP EQUIPMENT LISTS

Category	**A**	**Supplied and installed by Design Builder**
Category	**B**	**Supplied by Owner and installed by Design Builder**
Category	**C**	**Supplied and installed by Owner**

FUNCTION	ROOM #	ROOM NAME	Furniture/Equipment Name	Category	Quantity	Type	Specification	Representative Model
			Printer	C	1	E&T		
			Tool boards	A	1	SHOP	48" X 24" Poly Pegboard	H-7791
			Sawdust Collection System	A	1	SHOP	As per Statement of Requirements	
	20.01	METAL SHOP						
			Computer Stations	C	1	E&T		
			Computer Monitors	C	1	E&T		
			Wireless Access Point Device	B	1	E&T		
			Wall Mounted Classroom 75 inch TV	A	1	E&T		
			Phone	C	1	E&T		
			Bar Folder	A	1	SHOP	3-IN-1 SHEAR BRAKE ROLL MACHINE	Baileigh SBR-4020
			Bench Grinder	A	1	SHOP	Bench Grinder	BENCHTOP MODEL, 8", BAL-8107W with base GA20
			Buffer	A	1	SHOP	3HP with stan GA20	Baldor 1252 + GA20
			Ceiling Power Cords	A	8	SHOP	Industrial Cord Reel - 15A	Reelcraft H-7121
			Cnc Milling Machine	A	1	SHOP	CNC, Cutter, with wood cutting bits IE2015XC	ICONIC IE12015XC
			Crucible Furnaces	A	1	SHOP	Gas - melting such metals as aluminum, brass, silver and gold.	Johnson F900SS
			Cut Off Saw	A	1	SHOP	5" X 6" DUAL SWIVEL METAL CUTTING BANDSAW	King KC-129DS
			Disc Sander	A	1	SHOP	Belt/Disc Sander	General International 15-035DC
			Drill Press	A	3	SHOP	22 inch Drill Press	General International 75-500
			Forge	A	2	SHOP	Gas 400 Mbtu Forge	Johnson Model 133
			GAS Welder	A	4	SHOP	Heavy Duty, Deluxe, Commander Type Oxygen Acetylene Regulators, cutting torch, hose and welding tips	Forney Torch Kit 1711
			Metal Bender, Metal Break, Floor Shear, Foot Shear	A	1	SHOP	3-IN-1 SHEAR BRAKE ROLL MACHINE	Baileigh SBR-4020
			MIG Welder	A	4	SHOP	Mig Welder	MillerMatic 251
			Mill Drill Machine	A	1	SHOP	Turret Milling Machine	CANTEK YS-2VS
			Plasma Cutter	A	1	SHOP	CNC Plasma Cutting Machine	Lincoln Electric Torchmate® 4800 - A 4x8
			Sand Blaster	A	1	SHOP	Professional Sandblast Cabinet	Mod-U-Blast E3624DC
			Shop Wash Sink, Soap, Paper Towel, Degrease	A	1	SHOP	Washfountain, Terreon, Semi-Circular 54", B Drain	Bradley WF2504-B-STD-F-TMA-LSD
			Work Tables With Stools And Metal Work Vice Included on each corner	A	8	SHOP	Frame for Steel top Workbench, no castors, 36" x60" x 2" Need more information before determining suitability Bench Top must extend width of the Metal work vise +1" (8" HD Metal working vise)	
			Metal Lathe	A	4	SHOP	2HP, 1 PH, 220 Volt, 60 Hz. c/w 16 mm 7pc. set cutting tools	Precision Modern C0636A x 1000 (1440)
			Tool boards	A	8	SHOP	48" X 24" Poly Pegboard	H-7791

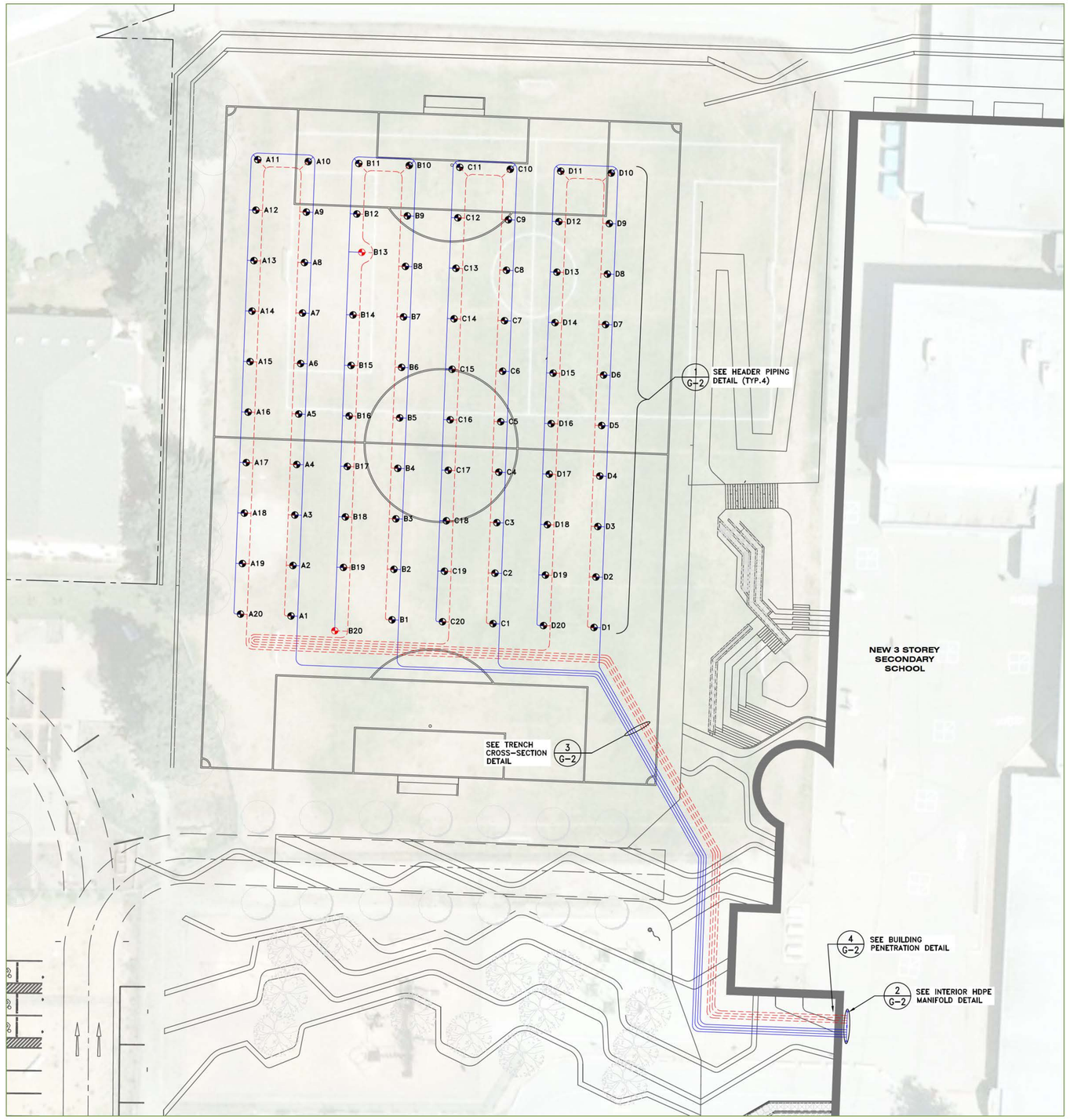
APPENDIX 1G

GEOEXCHANGE REFERENCE DOCUMENTS

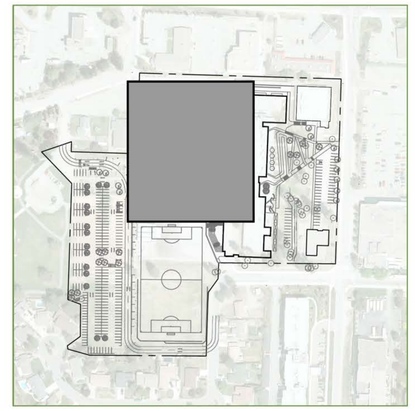
See separate document.

Appendix 1G Geoexchange Reference Documents

GEOTHERMAL SYMBOLS	
SYMBOL	DESCRIPTION
	PRIMARY BOREHOLE POSITIONS
	EXISTING BOREHOLE POSITIONS
	GEO SUPPLY (TO FIELD)
	GEO RETURN (FROM FIELD)



BORE HOLE PLACEMENT
1:200



SITE PLAN
1:2000

SCALE IN METRES 0 2m 4m 2m 8m 6m 12m 10m 16m 14m 20m 18m

station one architects
soarchitects.com
Abbotsford 203-2190 W. Railway St V2S 2E2
Chilliwack 9355 Young Rd V2P 4S3
604.793.9445

FALCON ENGINEERING
INGENUITY DELIVERED

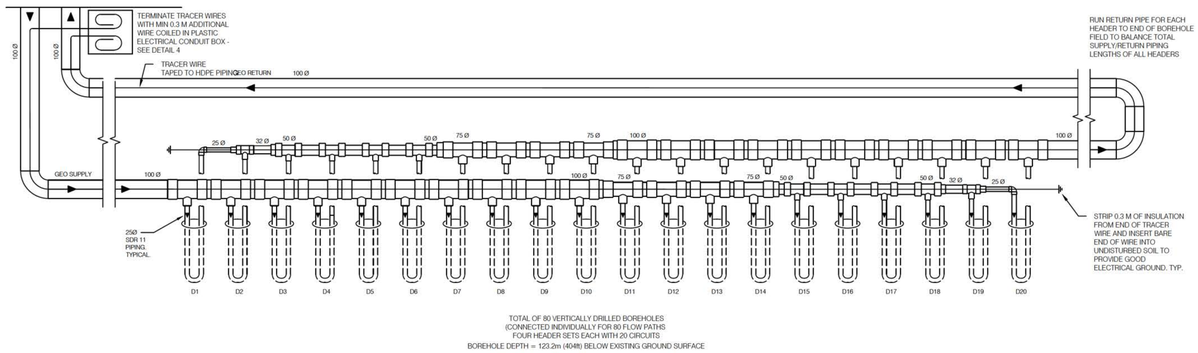
DRAWING NAME
WESTSIDE SECONDARY SCHOOL
3770 ELLIOTT RD, WEST KELOWNA, BC

REVISIONS		
NO.	DATE	DESCRIPTION
1	2022.12.01	ISSUED FOR INDICATIVE DESIGN
2	2023.01.26	ISSUED FOR OWNER REV EW

DRAWING NAME
BOREHOLE LAYOUT

JOB NO. 21102.000
SCALE 1:200
DWN JB
DGN RG
CHK JQ

G-1



1 HEADER PIPING DETAIL - TYPICAL OF FOUR
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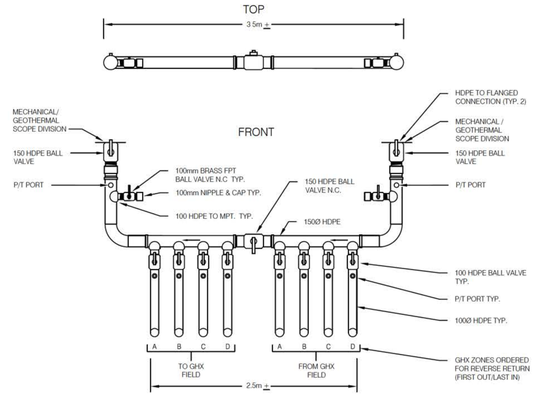

2 INTERIOR HDPE MANIFOLD DETAIL
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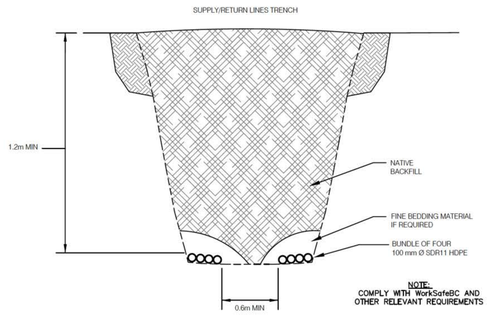

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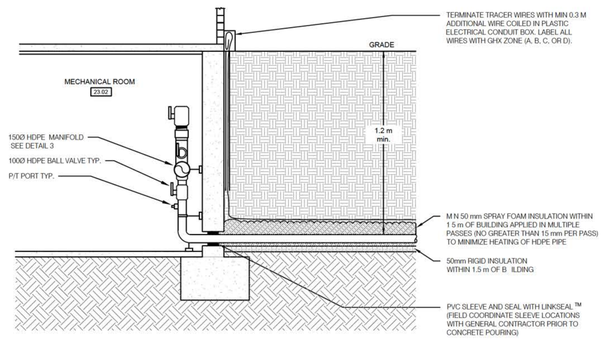

4 BUILDING PENETRATION DETAIL
NOT TO SCALE

station one architects
soarchitects.com
Abbotsford 203-2190 W. Railway St V2S 2E2
Chilliwack 9355 Young Rd V2P 4S3
604.793.9445

FALCON ENGINEERING
INGENUITY DELIVERED

DRAWING NAME
WESTSIDE SECONDARY SCHOOL
3770 ELLIOTT RD, WEST KELOWNA, BC

REVISIONS		
NO.	DATE	DESCRIPTION
1	2022.12.01	ISSUED FOR INDICATIVE DESIGN
2	2023.01.26	ISSUED FOR OWNER REV EW

DRAWING NAME
DETAILS

JOB NO. 21102.000
SCALE NTS
DWN JB | DGN RG | CHK AC

G-2

Example Template A – Borehole Information Completion Record

Borehole Drilling, Looping, Grouting Record										
Borehole ID	Driller (QWD)	Start/End Date	Casing Depth (ft)	Drill Depth (ft)	Loop Insertion Depth (ft)	In-situ Depth (both legs) (ft)	Grout Tremie Insertion Depth (ft)	No. of Initial Grout Batches Installed	No. of Top-up Grout	Notes/Unique Observations
A1										
A2										
A3										
…										
B1										
B2										
B3										
…										

Example Template B – Flushing and Purging Record

Flushing and Purging Record								
Zone (group of boreholes)	Date & time of start	Duration of Flush/Purge	Times of Flow Reversal and Duration	Flowrate and Pressure Measurements			Date time of completion	Notes/Unique Observations
				Start	Middle	End		
Zone A								
Zone B								
…								

Example Template C – Flow Test Data Record

Flow Test Data Record			
Zone A			
Date & time of start		Date & time of completion	
Zone Runout Pipe Flows:	Flow (USGPM)	Pressure differential across zone (PSI)	Notes/Unique Observations
30% Below Prescribed Flow			
At Prescribed Flow			
30% Above Prescribed Flow			
Borehole ID			
A1			
A2			
A3			
…			
Average Flow			
Total added Flow			
Zone B			
…			

Example Template D – Pressure Testing Record

Pressure Testing Data Record								
Zone (group of boreholes)	Date & time of start	Pressure at start	Number of pressure top-ups required before stabilizing	Pressure at Completion	Date & time of completion	Weather Conditions		Notes/Unique Observations
						Temperature at start/finish	Sun/cloud cover at start/finish	
Zone A								
Zone B								
…								

Example Template E – Antifreeze Installation Record

Antifreeze Installation Record						
Calculated Geo System volume (Gal)	Amount of Antifreeze required for 20% by Vol.	Product Details	Date & time of start	Date & time of completion	Time it took for full blending	Notes/Unique Observations

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 Time Schedule that is included in the Proposal Extracts, and that the Submittal Schedule will include all Submittals required under this Agreement and conform to the requirements identified in Section 17 of this 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:

(a) 15 Business Days for the Owner's review of Design Submittals, or

(b) 10 Business Days for the Owner's review of other Submittals,

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 or 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 Work that is the subject of the Submittals, for review of the Submittals and for the Design-Builder to make changes to the Submittals and the Work 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 Work 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 of the Project 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 Work 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 specified in this Agreement or 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 of this Schedule 2 – Review Procedure.

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 of receipt, date by which the Owner's comments are due and content of all returned Submittals and comments thereon. The Design-Builder will operate and maintain the Submittal log until the Total Completion Date and will provide the Owner's Representative, the Owner's Consultant and other designated Owner personnel with "real-time", secure, remote on-line access to the full content of the Submittal log.

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 this 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 specific Work that is the subject of the Submittal.

2.6 All Submittals will refer to the relevant provisions of this Agreement, including the Statement of Requirements, and to any matter that has previously been subject to review. All Submittals will:

(a) be accurate, complete and legible;

(b) 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);

(c) include revision numbers (if applicable);

(d) include document or drawing title(s);

(e) include name of entity that prepared the Submittal;

(f) 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; and

(g) include all pertinent information, including design data, sketches, drawings, calculations, inspection and test data, explanatory and background information and commentary, required to demonstrate conformance of the Submittal and the applicable Work with the requirements of this Agreement, including the Statement of Requirements.

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 Work 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 Work 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 applicable Work 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 this 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 2 – Review Procedure 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 63 of this Agreement that the revised comment is correct, the Design-Builder will make all such corrections to the Submittals and the Work.

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 – Review Procedure. 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, including employees, agents, contractors and subcontractors, the Owner's Consultant and such other persons as the Owner, from time to time, considers appropriate.

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 will include a User Consultation Group designated as the "Core User Group" with responsibility for coordinating the Design review process with the Design-Builder.

4.5 Unless otherwise agreed, Submittals will be provided and reviewed in accordance with the following:

(a) *Draft Submittal to the Owner*:

(i) the Design-Builder will provide a draft 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; and

(ii) all changes from a previous Submittal should be clearly indicated in accordance with Section 7 of this Schedule 2 – Review Procedure;

(b) *User Consultation Group*:

(i) 5 Business Days following receipt of the draft 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 Lead Architect or, if the Owner agrees, another representative of the Design-Builder's Consultant or another subject matter expert;

(iii) the Design-Builder's presentation will include a page-by-page review of the draft Submittal.

(iv) the Design-Builder's Representative must be in attendance, preferably in person but teleconference is acceptable; and

(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;

(c) *Informal Comments from the Owner*:

(i) the Owner will provide any informal feedback through to the Design-Builder; and

(ii) the Owner will provide additional informal feedback within one week after the presentation, unless the Owner advises the Design-Builder in writing. The period will not exceed two weeks unless agreed with the Design-Builder;

(d) *Formal Submittal to the Owner*:

(i) the Design-Builder will make the formal Submittal within 10 Business Days following the presentation (or 5 Business Days after receiving additional informal feedback); and

(ii) if the Design-Builder does not address the feedback received at the presentation or subsequently provided by the Owner, the Design-Builder will provide commentary on the reasons for not addressing the feedback; and

(e) *Formal Response from the Owner*:

(i) the Owner will respond within the applicable time specified in Section 1.2 of this Schedule 2 – Review Procedure.

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 parties will cooperate 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 this 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 the Central Okanagan, or another location designated by the Owner, at a space made available by the Owner.

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 or that the comment constitutes a Change, 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:

(a) confirm the original comment;

(b) notify the Design-Builder of a revised comment; or

(c) proceed with the comment as a Change in accordance with PART E – CHANGES of this Agreement.

Nothing in this Section 5 will limit either party's right to refer a Dispute for resolution under Section 63 of this 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, or failure to review or 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, or failure to review or comment, will not exclude or limit the Design-Builder's obligations or liabilities in respect of the Work under this Agreement, or exclude or limit the Owner's rights in respect of the Work under this Agreement.

7. SUBMITTAL EXPLANATION

7.1 At any time, the Owner may, acting reasonably, require the Design-Builder and any Design-Builder Persons, 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 requirements of this Agreement, including the Statement of Requirements.

8. REVISIONS

8.1 The Design-Builder will ensure that Submittals 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 Submittals, including all Drawings, Specifications, the Energy Model and any other Design Submittals, current. If any Submittals are revised as part of a Submittal, all other Submittals, including all Drawings, Specifications, the Energy Model and any other Design Submittals, relying on or based on those Submittals will also be revised accordingly. All such revised Submittals will also be submitted with the Submittal to which it relates.

9. AUDIT BY THE OWNER

9.1 Without limiting any other right under this 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 Work to which they relate and will advise the Owner of all such corrections and modifications.

SCHEDULE 3

INSURANCE CONDITIONS

Without restricting the generality of the indemnification provisions in Section 58, insurance and coverage will be arranged and paid for as follows:

1. DESIGN-BUILDER INSURANCE

1.1 The Design-Builder shall, without limiting its obligations or liabilities herein and at its own expense, provide and maintain the following insurance with insurers licensed in British Columbia and in forms, amounts and deductibles acceptable to the Owner:

(a) **Commercial General Liability Insurance** with a limit of not less than inclusive per occurrence against bodily injury and property damage. The Owner is to be added as an additional insured and include a cross liability clause under this policy. This insurance shall be primary and not require the sharing of any loss by any insurer of the Owner. This insurance will be maintained continuously from commencement of the Work until the Total Completion Date. This coverage is not required during the period that the Commercial General Liability – Wrap Up Insurance is in force in accordance with the Owner's obligations in Section 2.2 of this Schedule 3 – Insurance Conditions.

(b) **Professional Errors and Omissions Liability Insurance** protecting the Design-Builder or the Design-Builder's Consultant and their respective servant(s), agent(s) or employee(s) against any loss or damage arising out of the Design under this Agreement. The Design-Builder shall provide and maintain such coverage continuously from the commencement of the Work, and such insurance shall be maintained until years after the Total Completion Date. Such insurance will be for the adequate amount acceptable to the Owner and will in any event be not less than per claim.

The Design-Builder's Consultant's sub-consultant(s) shall maintain a minimum of Professional (Errors and Omissions) Liability insurance.

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.

(c) **Automobile Liability Insurance** in respect of each owned or leased vehicle if used directly or indirectly in the performance of the Work, subject to limits of not less than inclusive per occurrence. This insurance shall be maintained continuously from commencement of the Work until the Total Completion Date.

(d) **Owned or Non-Owned Aircraft (including Unmanned Aircraft Vehicles) Liability Insurance** 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 insurance will name the Owner as an additional insured and include a cross liability clause. This insurance shall be maintained continuously from commencement of any part of the work involving aircraft (including unmanned aircraft vehicles) until such part of the work is completed.

(e) **Owned or Non-Owned Watercraft Liability Insurance** 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. The insurance will name the Owner as an additional insured and include a cross liability clause. This insurance shall be maintained continuously from commencement of any part of the work involving watercraft until such part of the work is completed.

(f) **Contractors Pollution Liability Insurance**, where performance of the Work by the Design-Builder or any Subcontractor is associated with hazardous materials clean up, removal and/or containment, transit or 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. Any insurance required under this Section 1.1(f) must name the Owner as an additional insured, but only with respect to liability arising out of performance of the Work by the Design-Builder or any Subcontractor. Such insurance must include sudden and accidental and gradual pollution events for third party liability including ongoing and completed operations and shall not be impaired by any biological contaminants (including 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. This insurance shall be maintained continuously from commencement of any part of the work involving hazardous materials clean-up, removal and/or containment, transit and disposal until such part of the work is completed and including a month extended reporting period if any such insurance is provided on a claims-made basis.

(g) **Hot Roofing or Installation of Hot Membranes**, if the project is a renovation involving hot roofing work or installation of hot membranes, the contractor will provide, maintain and pay for a liability policy insuring hot roofing or installation of hot membrane operations with a limit of not less than inclusive per occurrence against bodily injury and property damage. This insurance will name the Owner as an additional insured and include a cross liability clause. This insurance will be treated as primary coverage and the Owner's Commercial General Liability - Wrap up Insurance will be treated as excess coverage.

Such insurance shall include, but not be limited to:

(1) Premises and Operations Liability;

(2) Products and Completed Operations;

(3) Owner's and Contractor's Protective Liability;

(4) Contractual Liability;

(5) Contingent Employer's Liability;

(6) Personal Injury Liability;

(7) Non-Owned Automobile Liability;

(8) Cross Liability;

(9) Employees as Additional Insureds; and

(10) Broad Form Property Damage.

This insurance shall be maintained continuously from commencement of hot roofing or installation of hot membrane work until such work is completed.

(h) **Contractor's Equipment Insurance** - the Design-Builder will maintain an "All Risks" insurance policy covering all construction equipment, mobile equipment, miscellaneous equipment, tools, office contents and other miscellaneous property whether owned, leased or rented or for which the Design-Builder may be responsible, that is used in any way in connection with this Agreement. The insurance will preclude subrogation claims by the insurer against the Owner.

1.2 Any insurance required under Sections 1.1(a), 1.1(b), 1.1(d), 1.1(e), 1.1(f) and 1.1(g) of this Schedule 3 – Insurance Conditions must be endorsed to provide the Owner with 30 days' advance written notice of cancellation.

1.3 As may be applicable, the Design-Builder must cause all Subcontractors to comply with the insurance requirements outlined in Sections 1.1(b), 1.1(c), 1.1(d), 1.1(e), 1.1(f) and 1.1(g) of this Schedule 3 – Insurance Conditions.

2. OWNER INSURANCE

2.1 The Owner shall, without limiting its obligations or liabilities herein and at its own expense, provide and maintain the insurance and coverages set out and as described in this Section 2.

2.2 **Commercial General Liability – Wrap Up Insurance** – this insurance will have a limit of not less than inclusive per occurrence, general aggregate, for third party bodily injury, death, and damage to property including loss of use thereof, product/completed operations liability with a limit not less than aggregate, and will comply with the following:

(a) the insurance will cover the Owner, the Design-Builder, the Design-Builder's Consultant, Subcontractors, consultants and anyone employed by them to perform a part or parts of the Work, but excludes all professional services and excluding suppliers whose only function is to supply and/or transport products to the Project Site or security protection persons or organizations providing Project 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;

(b) the insurance 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;

(c) the insurance will include coverage for:

(1) Premises and Operations Liability;

(2) Products or Completed Operations Liability

(3) Blanket Contractual Liability;

(4) Cross Liability and/or Severability of Interests;

(5) Contingent Employer's Liability;

(6) Personal Injury Liability;

(7) Shoring, Blasting, Excavating, Underpinning, Demolition, Piledriving, Subsurface and Grading, as applicable;

(8) Limited Pollution Liability

(9) Broad Form Tenants Legal Liability

(10) Operation of Attached Machinery; and

(11) Forest Fire Fighting Expenses

(d) any applicable deductibles will not exceed per occurrence except with respect to water damage, hot roofing and completed operations, to which a deductible not exceeding per occurrence will apply; and

(e) such coverage will be maintained continuously from commencement of the Work until the Substantial Completion Date for the Building, plus with respect to completed operations cover a further period of .

2.3 **Course of Construction (Builders Risk)** – coverage will be against "All Risks" of direct physical loss or damage including the peril of equipment breakdown, and will cover all materials, property, structures and equipment purchased for, entering into, or forming part of the Work while located anywhere within Canada and continental United States of America during construction, erection, installation and testing and commissioning, but such coverage shall be subject to off-site storage and transit exposure sub-limits and shall not include coverage for Design-Builder's and Subcontractors' equipment of any description. The following shall apply in respect of such coverage:

(a) there will be deductibles not exceeding:

for each and every occurrence, except for the following:

Earthquake with a deductible not exceeding of the total project value at the time of the loss, subject to a minimum

Water Damage perils (includes Flood and Sewer and Drain Back Up) with a deductible not exceeding

Soft Costs with a one 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.

(b) the coverage will include as a protected entity, each of the Owner, the Design-Builder, the Design-Builder's Consultant and each Subcontractor who is engaged in the Project;

(c) 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, or manufacturers (not employees of a protected entity);

(d) the Design-Builder will, at its 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; and

(e) such coverage will be maintained continuously from commencement of the Work and will be maintained until the Substantial Completion Date for the Building.

2.4 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.

3. OTHER INSURANCE

3.1 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.

4. GENERAL

4.1 The Design-Builder and/or its Subcontractors, the Design-Builder's Consultant and subconsultants as may be applicable, will be responsible for any deductible amounts under the policies of coverage and insurance except for the perils of flood and earthquake.

4.2 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.

4.3 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.

4.4 The Owner will not be responsible for injury to the Design-Builder or any of the Design-Builder's employees, or for loss of or damage to the Design-Builder's or Design-Builder's employees' machinery, equipment, tools or supplies which may be temporarily used or stored in, on or about the Project Site during construction and which may, from time to time, or at the termination of this Agreement, be removed from the Project Site. The Design-Builder hereby waives all rights of recourse against the Owner with regard to damage to the Design-Builder's property.

4.5 If the Design-Builder fails to provide, maintain and pay for insurance as required by this schedule, other than automobile liability insurance, the Owner may obtain and pay for the required insurance, the cost of which will be payable by the Design-Builder on demand by the Owner. The Owner may set-off such amounts from monies due to the Design-Builder if not paid within 15 days.

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.infrastructurebc.com.

1.2 The Design-Builder will consult and cooperate with the Owner regarding communications activities relating to the Project.

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 Work.

1.7 This Schedule is a guideline and may be amended by mutual agreement. Except for Section 1.8 of this Schedule 4 – Communication Roles, 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 63 of this 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 of this Schedule 4 – Communication Roles, this Schedule is subject to the parties' obligations in respect of Confidential Information pursuant to Section 66 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) 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;

(b) Consultation: engaging in discussions with Project stakeholders;

(c) Media Relations: providing media with Project updates and responding to issues raised by the media; and

(d) 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 4 – Communication Roles, 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 Work is 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	Owner	Design-Builder
Moves	Owner	Design-Builder
Traffic	Owner	Design-Builder
Noise	Owner	Design-Builder

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, 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	Position Title	Duties and Responsibilities
Randy Kyrzyk	Clark Builders (British Columbia) Inc.	Design-Builder's Representative	As described in Section 5.3
Michael Duchcherer	Clark Builders (British Columbia) Inc.	Design-Build Design Manager	The individual responsible for oversight of the Design-Builder's Consultant
Annerieke van Hoek	studioHuB Architects Ltd.	Lead Architect	The individual responsible for leading the Design
Stephen McNicholls	SMcN Consulting Inc.	Mechanical Design Engineer Lead	The individual responsible for leading the mechanical design of the Project
Mo Khan	O'M Engineering Inc.	Electrical Design Engineer Lead	The individual responsible for leading the electrical design of the Project
Dustin Suurhoff	Clark Builders (British Columbia) Inc.	Design-Build Construction Manager	The individual responsible for leading the Construction
Mohammad Fakoor	Read Jones Christoffersen Ltd.	Building Performance Professional	The professionally accredited individual responsible for leading the development and maintenance of the Energy Model.
To be confirmed following appointment in accordance with Section 33.3		Independent Commissioning Agent	As described in Section *33.3*

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.

Form A1 – Breakdown of Contract Price and Monthly Progress Payments

	Value	Notes
HARD COSTS		
Division 1 - General Requirements	$	
Division 2 - Existing Conditions Including Demolition and Hazardous Material	$	
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 19 - Geoexchange Ground Heat Exchanger (GHX)	$	
Division 21 - Fire Suppression	$	
Divison 22 - Plumbing	$	
Division 23 - Heating, Ventilating, and Air Conditioning (HVAC)	$	
Division 24 - Commissioning	$	
Division 25 - Building Management System	$	
Division 26 - Electrical	$	
Division 27 - Communications	$	
Division 28 - Electronic Safety and Security	$	
Division 31 - Site Works	$	
Division 32 - Earthworks	$	
Division 33 - Off-Site Improvements	$	Including Off-Site Utilities
Division 34 - Utilities	$	Onsite Utilities Only
Temporary Works	$	
Other (Specify)	$	
Other (Specify)	$	
Other (Specify)	$	
Hard Costs Sub-Total	**$**	
SOFT COSTS		
Architectural Design Fees	$	
Structural Design Fees	$	
Mechanical Engineering Design Fees	$	
Electrical Engineering Design Fees	$	
Civil Engineering Design Fees	$	
Geotechnical Engineering Design Fees	$	Inc. in Civil Eng. (line 43)
Building Envelope Consultants Fees	$	
Landscape Architect Fees	$	
Code Consultant Fees	$	
Legal Advisor Fees	$	
Landscape and Arborist Fees	$	Inc. in Landscape Arch. (line 46)
Food Service Consultant Fees	$	Inc. in Architecural (line 39)
Wayfinding Consultant Fees	$	Inc. in Architecural (line 39)
Energy Modellng Fees	$	
Commissioning Agent	$	
Other Consultant - Specify	$	Acousticals Consultant
Insurances - Specify	$	Professional Liability
Insurances - Specify	$	N/A
Building Permit	$	
Development Cost Charges	$	
Other - Specify	$	
Other - Specify	$ -	
Soft Costs Sub-Total	**$**	
GENERAL EXPENSE COSTS		
Pursuit Costs	$	
Mobilization	$	
Mockups	$	Inc. in Hard Costs
Ongoing General Expenses	$	Shown below (lines 68 to 71)
Project Staff	$	
Project Overhead	$	
Construction Equipment	$	
Testing	$	
Bonding and Security	$	Bonding of Clark Builders (Subtrade Bonding Inc. in Hard Costs)
Insurance	$	
General Expense Sub-Total	**$**	
Total Costs	$	
Intersection Upgrade Cash Allowance	$	
Sanitary Line Relocation Cash Allowance	$	
Fee	$	
Nominal Cost of the Proposal (Contract Price)	**$ 97,636,563**	

Period Ending	Expected Monthly Progress Payments
29-Feb-24	
31-Mar-24	
30-Apr-24	
31-May-24	
30-Jun-24	
31-Jul-24	
31-Aug-24	
30-Sep-24	
31-Oct-24	
30-Nov-24	
31-Dec-24	
31-Jan-25	
28-Feb-25	
31-Mar-25	
30-Apr-25	
31-May-25	
30-Jun-25	
31-Jul-25	
31-Aug-25	
30-Sep-25	
31-Oct-25	
30-Nov-25	
31-Dec-25	
31-Jan-26	
28-Feb-26	
31-Mar-26	
30-Apr-26	
31-May-26	
30-Jun-26	
31-Jul-26	
31-Aug-26	
30-Sep-26	
31-Oct-26	
30-Nov-26	
31-Dec-26	
31-Jan-27	
28-Feb-27	
31-Mar-27	
30-Apr-27	
31-May-27	
30-Jun-27	
Nominal Cost of the Proposal	$ 97,636,563

SCHEDULE 7

PROPOSAL EXTRACTS

See separate document.

This page and the following 63 pages removed in their entirety

SCHEDULE 8

ENERGY

See separate document.

SCHEDULE 8
ENERGY

1. INTERPRETATION

1.1. Definitions

In this Schedule, in addition to the definitions set out in Section 1 of this Agreement:

"**Airtightness Integrity Supervisor"** is a person who will ensure continuity and integrity of the air barrier across all disciplines and trades.

"Airtightness Test Report" means the report prepared in accordance with Section 2.4 of Schedule 8.

"**Airtightness Testing Plan"** means a plan that is prepared in accordance with Section 2.4 of Schedule 8.

"**Building Envelope Thermal Bridging Guideline"** or **"BETBG"** means the guidance document entitled *"Building Envelope Thermal Bridging Guideline"*, v1.6, 2021 located at https://www.bchousing.org/research-centre/library/residential-design-construction-guides/building-envelope-thermal-bridging and also with building assembly details found at www.thermalenvelope.ca.

"**Building Performance Professional**" means a Registered Professional as described in the Engineers and Geoscientists of British Columbia Joint Professional Practise Guidelines entitled *"Whole Building Energy Modelling Services"* and takes responsibility for energy modelling and signing and sealing the report.

"Carbon Tax" means the carbon tax in the Province of British Columbia and is the cost of emitting greenhouse gases from fossil fuels in British Columbia. For the Energy Model apply \$65/tonCO_2e produced.

"Electricity Emissions Intensity Factor" means the Greenhouse Gas Emissions intensity factor for BC Hydro Electricity Emission Intensity Factor is 10.67 tCO2e/GWh.

"**Energy**" means all energy consumed, including electrical energy, fossil fuels, biofuels and thermal energy used within, by or for the Building, including electrical and thermal energy used within, by or for exterior elements connected to the Building's electrical and thermal systems.

"**Energy and Greenhouse Gas Emissions Guarantee**" has the meaning given in Section 2.1 of this Schedule.

"**Energy Cost**" refers to the modelled annual Energy utilities cost to operate the Building in Canadian dollars.

"**Energy Model**" means the hourly energy simulation model and simulation produced using the Energy Modelling Software, associated calculations, and summary Energy Modelling Report with results. The Energy Model created with the Energy Modelling Software will follow Schedule 8 Appendix 1: Energy Model Methods and Deliverables. The results of the simulations will be used to calculate the Energy use, Greenhouse Gas Emissions and operating cost, based on the assumptions in Appendix 1: Energy Model Methods and Deliverables;

"**Energy Modelling Report**" means the report prepared in accordance with Schedule 8 and Appendix 1 of Schedule 8.

"**Energy Modelling Software**" means the whole building energy modelling software, IES VE or eQuest, or an Equivalent accepted by the Owner in accordance with Section 1.3 of this Agreement.

“Energy Target” means the Total Energy Use Intensity Target value described in the definition of Total Energy Use Intensity Target.

"**Environmental Credit**" means any income, credit, right, benefit or advantage relating to environmental matters including type and level of emissions, means of production of Energy, input sources and compliance with any environmental laws, regulations, rules or orders.

“Final Airtightness Test” means an airtightness test that measures the airtightness of the Building after the wall board is installed, the assemblies are fully completed, and all systems are constructed;

"Greenhouse Gas” or “GHG” means gas in the atmosphere that traps radiation energy from sunlight. For the purpose of the Energy Model normalize all GHG to CO_2 so the metric is represented as CO_2e.

“Greenhouse Gas Emissions” or **“GHG Emissions”**, means the annual greenhouse gas emissions resulting from all Building Energy use per year. The greenhouse gas emissions will be calculated as described in Section 1.7.

"**Greenhouse Gas Emissions Intensity" or “GHGI”** means the annual greenhouse gas emissions resulting from all Energy use on Site divided by the total Modelled Floor Area, expressed as kg eCO_2/m^2-year. The GHGI is not to exceed 4.5 $kgCO_2e/m^2$-year.

"**Greenhouse Gas Emissions Intensity Target**" is a measure of the Building’s greenhouse gas emissions, as measured using the GHGI, associated with all Energy use on Site.

"**Independent Energy Consultant**" means a consultant, at the Owner’s discretion, who may review the results of the Energy Model.

“Mechanical Engineer” means the engineer responsible for the design of the mechanical HVAC systems.

"Mid-Construction Airtightness Test” means a pressurized test completed after air barrier is in place and prior to wall board being installed. The Mid-Construction Airtightness Test is defined in Section 2.4.

"**Modelled Floor Area**" of **“MFA”** means total floor area included in the Energy Model and is the total enclosed floor area of the Building, as reported by the Energy Modelling Software, excluding exterior areas and indoor (including underground) parking areas. All other spaces, including partially conditioned and unconditioned spaces within the thermal envelope, are included in the MFA. The MFA must be within 5% of the gross floor area from the architectural drawings unless justification is provided demonstrating where the discrepancy arises and why the MFA should differ from the gross floor area by greater than 5%.

"Natural Gas Emission Factor” means the Greenhouse Gas Emissions per one gigajoule of natural gas combusted. The Natural Gas Emissions Factor is 49.87 $kgCO_2e/GJ$.

"**Particulate Matter Emissions**" or "**$PM_{2.5}$**", are fine particles that have a diameter of less than 2.5 micrometers that remain suspended in the air for long durations. $PM_{2.5}$ pose a greater health risk than other particulates as the particulates are small enough to travel deep into the respiratory system.

“Process Load” means Energy consumption other than zone lighting or zone receptacle loads that in general are a function of the occupant-driven or education processes occurring within the Building rather than Energy consumption associated with operation of the Building.

"**Renewable Energy Electricity Generation**” means electricity is generated on-Site from renewable sources such as solar radiation via photovoltaic panels (PV) or wind.

"**Thermal Energy Demand Intensity**" or "**TEDI**" means the amount of annual heating energy needed to maintain a Building's stable interior temperature. TEDI is expressed in kWh/m^2 per year. The TEDI is defined in accordance with the BC Building Code definition.

"**Total Energy Use Intensity**" or "**TEUI**" means the annual Energy used by the Building divided by the total Modelled Floor Area, expressed in kWh per m^2 per year. Does not include the energy use of the Existing Gymnasium.

"**Total Energy Use Intensity Target**" means the Building's annual Total Energy Use Intensity is not to exceed 90 kWh per m^2 of Modelled Floor Area per year.

"U x A" means the area-weighted, average thermal performance of the Building envelope.

"U x A Calculation" means the calculation used to calculate the modified U x A value of the Building envelope. Calculation is in accordance with the NECB and normalized to a m2 of vertical façade.

"U x A Target" means the U x A calculation for the Building vertical façade is equal to or less than U 0.120 Btu/ft2-^{o}F-h.

"US Army Corps of Engineers Air Leakage Test Protocol for Building Envelopes" means the *"US Army Corps of Engineers Air Leakage Test Protocol for Building Envelopes"* version 3 accessed here, https://www.wbdg.org/FFC/ARMYCOE/usace_airleakagetestprotocol.pdf .

"**Weather Data**" means the actual recorded weather data based on Environment Canada's "National Climate Data and Information Archive", including daily temperature in TMY or CWEC format.

2. ENERGY AND GREENHOUSE GAS EMISSIONS GUARANTEE

2.1. Meet or Be Less Than the Energy Target and Greenhouse Gas Emission Intensity Target

The Design-Builder warrants to the Owner that the Building will be designed and constructed so that the Energy use per year will not exceed the Energy Target and will not exceed the Greenhouse Gas Emissions Intensity Target (the "**Energy and Greenhouse Gas Emissions Guarantee**"). The Design-Builder will engage a Building Performance Professional to carry out the Energy Model.

2.2. Design and Construction Period

(a) The Design-Builder warrants to the Owner that at all times during the Design and Construction period, and prior to and including Substantial Completion, and upon completion of Construction in compliance with the current Design Submittals that have received the notation "REVIEWED" under the Review Procedure, the Building will not exceed the Energy and Greenhouse Gas Emissions Guarantee.

(b) The Design-Builder will, with each Submittal under the Review Procedure, identify any impacts on the Energy and Greenhouse Gas Emissions Guarantee or the assumptions set out in Appendix 1, for review by the Owner. Any such impacts will not be effective unless agreed in writing by the Owner. If the Design-Builder does not identify any impacts, the Submittal will be deemed to have no impact on the Energy and Greenhouse Gas Emissions Guarantee or the assumptions set out in Appendix 1.

(c) At each of the following Design stages:

(i) 30%;

(ii) 60%;

(iii) 95%; and

(iv) 100%,

and together with the application for the Substantial Completion Certificate,

and at any other point during the project where a Change is made for which the Owner reasonably deems necessary, the Design-Builder will provide an updated Energy Model prepared by the Building Performance Professional that demonstrates that the Energy and Greenhouse Gas Emissions Guarantee will be met.

(d) If the Design-Builder at any time prior to Substantial Completion fails to demonstrate that the Energy and Greenhouse Gas Emissions Guarantee will be met, the Design-Builder will:

(i) revise the Design and re-submit the relevant Design Submittals, together with an updated Energy Model prepared by the Building Performance Professional, demonstrating the Energy and Greenhouse Gas Emissions Guarantee will be met, to the Owner for review under the Review Procedure; and

(ii) modify the Work as required to comply with the revised Design Submittals that have received the notation "REVIEWED" under the Review Procedure.

(e) The Owner will not be required to make any payment for any Design or Construction that fails to comply with or will cause the Design-Builder to fail to comply with, the Energy and Greenhouse Gas Emissions Guarantee. The Payment Certifier will assess any such Design and Construction and apply a holdback for the value of correction of such Design and Construction, until the Design and Construction is modified to comply with the Design Submittals that have received the notation "REVIEWED" under the Review Procedure and demonstrate that the Energy and Greenhouse Gas Emissions Guarantee will be met.

(f) The Design-Builder will retain a Building Performance Professional who will:

(i) review the Energy Model updates and confirm that the Energy and Greenhouse Gas Emission Guarantee will be met and will continue to be met;

(ii) ensure the Energy Model is updated on an-ongoing basis with each Submittal and notify the Design-Builder and the Owner of changes to the proposed Energy Model results resulting from the Submittals or Changes; and

(iii) provide updates relating to the Energy Model results, Energy use, and Greenhouse Gas Emissions to the Owner at regular intervals as required by the Owner.

(g) The Owner reserves the right to retain an Independent Energy Consultant to review the Energy Model, proposed changes or updates, and confirm that the Energy and Greenhouse Gas Emissions Guarantee will be met.

2.3. Energy and Greenhouse Gas Emissions Guarantee Post Substantial Completion

Notwithstanding any other provision of this Agreement, the Design-Builder does not warrant and is not liable under this Section 2 for failing to meet the Energy and Greenhouse Gas Emissions Guarantee or the actual Energy Target during building operations and after Substantial Completion.

2.4. Airtightness Confirmation

The Design-Builder will complete Building envelope airtightness testing at not less than two stages of the Building construction to assess and confirm the Buildings airtightness. This measured airtightness will be applied in the Energy Model and will mark the basis of the final TEUI and GHGI result.

(a) **Airtightness Testing General Approach**

(i) An Airtightness Integrity Supervisor shall be designated for the project. The role of the Airtightness Integrity Supervisor is to ensure continuity and integrity of the air barrier across all disciplines and trades and throughout the design and construction of the project.

(ii) Air barrier should be suitably supported and able to withstand both negative and positive pressure at 75 Pa prior to and post wallboard installation.

(iii) Airtightness testing protocols to be in compliance with US Army Corps of Engineers Air Leakage Test Protocol for Building Envelopes; or ASTM E779 Standard Test Method for Determining Air Leakage Rate by Fan Pressurization with an induced test pressure at building completion of not less than 75 Pa.

(iv) Submission of an Airtightness Testing Plan not less than 4 weeks prior to the start of both the Mid-Construction Airtightness Test and Final Airtightness Test. The Airtightness Testing Plan is described in Section (b) below.

(v) Measured air leakage rate will be used to assess the performance of the building using the Energy Model. The measured rate of the Final Airtightness Test will be applied in the Energy Model and an updated TEUI and GHGI reported.

(vi) Prior to airtightness testing verify airtightness target values and surface area calculations with Building Performance Professional.

(vii) Coordinate the airtightness test with the Airtightness Integrity Supervisor, building envelope specialist, and Design-Builders Building Performance Professional. Representatives for each to be available on-site during testing.

(viii) Communicate preliminary target airtightness values and air leakage locations to Design-Builder, Airtightness Integrity Supervisor and Building Performance Professional before demobilizing following completion of the airtightness test. If time permits, allow Design-Builder representative to seal air leakage points and retest before demobilization.

(ix) The constructed airtightness target will be based on National Energy Code of Canada for Buildings (2020; NECB 2020) which is different from the infiltration rate used to demonstrate compliance in the Energy Model. The NECB 2020 indicates that an airtightness rate of not more than 1.5 l/s/m^2 of building area at 75 pascals. The constructed airtightness rate will be set to be 1.0 l/s/m^2 of building area at 75 pascals.

(b) **Airtightness Testing Plan**

(i) Submit to the Owner for review an Airtightness Testing Plan not less than 4 weeks prior to both the Mid-Construction Airtightness Test and Final Airtightness Test.

(ii) The Airtightness Testing Plan should include, but not be limited to, the Building dimensions and volumes, a list of the people who will complete the test, a description of people and their roles who will be present during the test, the target airtightness rate, compartmentalizing strategy, a description of how to complete the airtightness test during active construction, the number of test doors and set-up positions, the expected schedule or staging of the testing if done in multiple stages, the target air pressures, target air testing pressurizing strategy and maximum pressure, air leaks assessment tools or equipment

that may be used to identify leaks, threshold values for investigating or assessing leaks, and a remedial action strategy should leaks be identified.

(iii) Staged airtightness testing may be required and will be described in the Airtightness Testing Plan.

(c) **Mid-Construction Airtightness Test**

(i) The purpose of the Mid-Construction Airtightness Test is to provide a quantitative assessment of the performance of the air barrier. The intention of the Mid-Construction Airtightness Test is to provide feedback to the construction methods and air barrier integrity and estimate what Final Airtightness Test results can be expected or where changes and/or repairs are required before the Final Airtightness Test is completed.

(ii) A Mid-Construction Airtightness Test will be completed after air barrier is in place and prior to wallboard being installed.

(iii) Depending on project phasing the building may need to split the building into sections with multiple Mid-Construction Airtightness Tests being performed. Guarding should be implemented if it is thought that inter-section air leakage will affect results.

(iv) Mid-Construction Airtightness Test will be at the direction of a Building envelope specialist but expected to achieve the highest-pressure rate and targeting the final testing rate of 75Pa. If less than 75Pa is achieved, a minimum of 10 pressure points ranging from 20 Pa to the maximum pressure rate are to be measured. The building envelope air leakage rate is to be extrapolated to 75Pa.

(v) Mid-Construction Airtightness Test pressure will be at the direction of the Building envelope specialist but is expected to be completed in only one direction with pressure pushing air barrier against support.

(vi) Utilize Design-Builder, building envelope specialist, Building Performance Professional for completing the Airtightness Testing Plan.

(vii) The building envelope specialist will ensure the Mid-Construction Airtightness Test is completed using methods that do not risk damaging the air barrier. Should the Mid-Construction Airtightness Test identify the air barrier is not able to withstand the test pressure, the air barrier will be repaired and the Mid-Construction Airtightness Test repeated once the air barrier is better supported and able to withstand the Mid-Construction Airtightness Test pressures.

(viii) If test results are 20% above the target airtightness values, locate air leakage sites in accordance with Section 4.11 of US Army Corps of Engineers Air Leakage Test Protocol for Building Envelopes. Provide findings, infrared photos and theatrical smoke tests videos to Owner, Design-Builder, Airtightness Integrity Supervisor and Building Performance Professional.

(ix) While the building is under 30Pa of pressure, perform a walk-through, note any obvious air leakage locations, and include them in the Airtightness Test Report.

(x) Submit to the Owner an Airtightness Test Report. The Airtightness Test Report will include the methods, observations, results, diagnostic testing carried out, any remedial measures taken and/or reasons why remedial measures were not taken. As needed, included photos, graphs, and analysis. This report will be submitted to the Owner for review within two weeks of completing the Mid-Construction Airtightness Test. If airtightness testing is staged, an Airtightness Test Report will be provided following the completion of the latest test. If more than four weeks will elapse between initial stage of airtightness testing and the last stage of the airtightness test interim report will be submitted to the Owner for review.

(d) **Final Airtightness Test**

(i) At the direction of the building envelope specialist, the Final Airtightness Test is expected to achieve 75 Pa. If the maximum safe building pressure is less than 75 Pa then perform a multipoint test up to the safe building pressure. Once the building has been repaired and a safe building pressure of 75 Pa can be achieved the Final Airtightness Test is to be repeated.

(ii) The target airtightness for the building is not the same as the energy modelled infiltration rate. The tested / measured infiltration rate will be lower (*i.e.,* less leaky) when compared to the modelled infiltration rate. The modelled infiltration rate is not the airtightness test target air leakage rate.

(iii) The target airtightness test rate for construction will be based on the NECB 2020 infiltration method. The target measured airtightness testing rate will be in accordance with NECB 2020 and the construction target will be 1.0 l/s/m^2 at 75 Pa, which, as described in the NECB 2020, is below the maximum allowable rate of 1.5 l/s/m^2.

(iv) Both a positive and negative pressure test are to be performed and reported.

(v) If test results are above or less than 10% below the target airtightness values, locate air leakage sites in accordance with Section 4.11 of US Corps of Engineers Air Leakage Test Protocol for Building Envelopes. Provide findings, infrared photos and theatrical smoke tests videos to Design-Builder, Airtightness Integrity Supervisor and Building Performance Professional.

(vi) While the building is under 30 Pa of pressure, perform a walk-through, note any obvious air leakage locations, and include them in the Airtightness Test Report.

(vii) The measured airtightness rate will be used in the final Energy Modelling Report and this report will be submitted to the Owner prior to Substantial Completion.

(viii) Submit to the Owner an Airtightness Test Report that includes the testing methods, approach, observations, results, diagnostic testing carried out, any remedial measures taken and/or reasons why remedial measures were not taken. As needed, included photos, graphs, and analysis. This report will be submitted to the Owner for review within four weeks of completing the Final Airtightness Test. The results of this test will be used to confirm the final TEUI and GHGI.

(ix) The final Energy Model and Energy Modelling Report will include results that apply the infiltration rate described in this Schedule 8 and also the airtightness rate measured during the airtightness test. The final Energy Model and Energy Modelling Report will demonstrate compliance using the Schedule 8 infiltration rate. The TEUI and GHGI will be reported using the Schedule 8 infiltration rate and the infiltration rate measured during the airtightness test.

2.5. Daycare Space Energy Requirements

(a) Should the daycare space / NLC space be integrated into the Building, the Energy Target and Greenhouse Gas Emission Intensity Target are expected to apply. The TEUI and GHGI targets were developed assuming the NLC space would reside outside of the footprint of the Building. Because Energy Model inputs for the NLC space are similar to schools and because the overall proportion of floor area allocated to the NLC space relative to the remainder of the school area is small, the overall impact of the NLC space to the Energy Target and Greenhouse Gas Emission Intensity Target is expected to be low.

(b) Should these assumptions not be in alignment with the findings of the Energy Model, reconsideration to the Energy Target to accommodate the NLC space, when integrated into the Building, may be given by the Owner.

(c) Should the NLC space be located in a stand-alone building, the energy performance of the building will be assessed independently of the Building.

(d) The Energy Target and Greenhouse Gas Emission Intensity Target for the NLC space, should it be a stand-alone building, will be forthcoming. Expect the Energy Target and Greenhouse Gas Emission Intensity Target to perform better than the energy code minimum requirements for the building type by 10% to 20%. Further details regarding this target will be forthcoming.

3. ENVIRONMENTAL CREDITS

3.1. Entitlement to Environmental Credits

The Owner will be entitled to any and all Environmental Credits related to the Building and its operation and the Design-Builder will use commercially reasonable efforts to assist the Owner in achieving the maximum Environmental Credits available with respect to the Building.

APPENDIX 1 SCHEDULE 8: ENERGY MODEL METHODS AND DELIVERABLE

1. ENERGY MODEL METHODOLOGY AND ASSUMPTIONS

The intent of this Appendix and associated Appended tables is to provide clarity to the Design-Builder for the modelling methodologies, standardized inputs and the assumptions to relate the respective controlled variables as per the intent by the Owner.

1.1. General

(a) The Design-Builder shall apply the Energy Model assumptions and methodologies outlined in Schedule 8 for the Energy Model and supporting documentation submitted in relation to the Energy Target and Greenhouse Gas Emission Intensity Target.

(b) Assumptions and methodologies required for modelling, not otherwise described in this Appendix 1 of Schedule 8, shall be explicitly stated and described in the Energy Modelling Report.

(c) The Energy Modelling Report shall include detailed information on the Energy Model inputs as they relate to:

(i) the methods and materials used for the construction of components, systems and assemblies used in the building envelope modelling.

(ii) the components, systems, equipment, and associated services used in the provisioning of ventilation, heating, and cooling systems; and

(iii) the provision of automation and control, schedules, set-points, strategies and methodologies.

(d) The Energy Model will reflect the Design and be updated as the Design progresses to maintain an Energy Model that reflects the most current Design.

(e) The methodology for producing Energy Models as described in this Appendix shall take precedence over LEED, ASHRAE 90.1-2010 Appendix G Rating Method, ASHRAE 90.1-2016 Appendix G Performance Rating Method and any other energy modelling protocols. Where not specified herein, follow modelling procedures in accordance with protocols of Step Code /City of Vancouver Modelling Guidelines/NECB Performance Compliance.

(f) A ‘baseline’ or ‘reference’ Building simulation is not required for the Energy Target or Greenhouse Gas Emission Intensity Target.

(g) Any modelling requirements, including ‘baseline’ or ‘reference’ Building simulation, which is required for incentive, rebate or credit purposes will be constructed as a modelling exercise decoupled from the modelling required for the Energy and Greenhouse Gas Emissions Guarantee. Inputs required from incentive, rebate or credit programs will be completed to satisfy those programs and may require inputs and analysis that diverge from the inputs described within and for the Design required for the Energy and Greenhouse Gas Emissions Guarantee.

(h) Compliance with the Energy and Greenhouse Gas Emissions Guarantee provisions of Schedule 8 is required regardless of simulation and calculation tools, or techniques employed by the Design-Builder.

(i) Referenced tables are included at the end of the Appendix 1.

1.2. **Simulation Scenario**

(a) The objective of the simulation scenario is to provide the Owner information for utility planning purposes and to provide the Owner an estimate of the overall effect future climate scenarios may have on utility use and equipment operation for the Building.

(b) Two Scenarios will be assessed: Scenario A is the Energy Model and Energy Modelling Report with no future scenario inputs. Scenario A is the Energy Model for the building as described in Schedule 8. Scenario B includes the same Energy Model inputs as Scenario A and then applies the 2050 weather file. Scenario B is intended to demonstrate the relative impact of future climate scenarios to the utility use and Energy use.

(c) A summary of Scenario A and Scenario B are shown in Table 1: Simulation Scenario Description below.

(d) The Scenario is required for the 95% Energy Modelling Report submission and will be required after the Effective Date for review by the Owner. Should clarifications be required from the Owner respecting the Scenario assessment, an updated Scenario assessment will be included in the Substantial Completion report.

(e) The Scenario assessment results can be included as an Appendix document to the Energy Modelling Report.

Table 1: Simulation Scenarios Description

Simulation Scenario	Utility Rate Scenario	Weather Scenario	Total Energy Use by Fuel Use	Energy Use by End-Use	Utility Cost & GHG Emission Summary	Peak Demand by month
A	Current,	2020	report	report	report	report
B	Maintain Current rates	2050	report	report	report	report

1.3. **Energy Modelling Software**

(a) For determining the Energy Target and the Greenhouse Gas Emission Intensity Target, Energy Modelling Software shall at a minimum have the following abilities:

(i) explicitly model 8760 hours per year;

(ii) hourly variations in occupancy, lighting power, miscellaneous equipment;

(iii) HVAC system operation variations in setpoints and schedules;

(iv) part-load performance curves for systems and equipment;

(v) complex utility rates including energy charges, demand charges, ratchets, and other taxes and fees; and

(vi) output time-series variables in the following electronic file format:

(A) tab- or comma-separated values; and

(B) spreadsheet files.

(b) Other supporting calculation tools are at the discretion of the Design-Builder.

(c) Operating schedules, as defined in this Appendix 1, are described here within;

(d) It is understood that the Design-Builder may perform calculations outside of the Energy Modelling Software. The Design-Builder will document these calculations and include all calculations in the Energy Modelling Report.

1.4. **Energy Modelling Report Content**

Provide an Energy Modelling Report, submitted to the Owner for review in accordance with the delivery schedule described in Section 2.2I. The Energy Modelling Report will be complete with summary of Energy Model inputs, calculations, assumptions, results, fuel and energy end-use breakdown, including heating, cooling, lights, fans, pumps, service water heating, and plug and process loads, Energy use total and by fuel, and total and by fuel normalized to m^2 of building area, Greenhouse Gas use intensity total and by fuel and total and by fuel normalized to m^2 of building area, and by utility cost total and cost by fuel type.

The Energy Modelling Report must describe the project in sufficient detail to allow understanding of the Building and the simulation process taken to arrive at the final building results. It must include a description of issues or exclusions that will or could affect the performance of the Energy Model.

Confirm design details used in the Energy Model reflect the design details provided by other disciplines and subconsultants and will include, but may not be limited to, architectural layout, massing and orientation, architectural envelope assembly details, mechanical system details, geoexchange design details, and electrical system details.

Provide discussion within the Energy Modelling Report that describes the design approach and building systems in the building design that contribute to:

i. energy consumption reduction below the minimum energy code performance requirements, and meeting the TEUI target; and
ii. greenhouse gas emission reduction below a building that meets the minimum energy code performance requirements and meeting the GHGI target.

The Energy Model will include the following sections and details:

(a) Executive Summary;

(b) Project Specific Information

(i) Statement of software used and version;

(ii) Project name, address, and general project location description;

(iii) Project team;

(iv) Applicable Building Code and applicable energy code(s), standards(s), programs(s), guidelines(s) or other modelling requirements used;

(v) Applicable Compliance Pathway applied;

(vi) Statement of climate zone;

(vii) Statement of weather file data applied.

(c) Summary of Building, dimensions, areas and volume broken down into:

(i) Description of Building layout and use;

(ii) total Modelled Floor Area (MFA) (m2) – refer to Section 1.2 of this Appendix;

(iii) conditioned area* (m2);

(iv) semi-conditioned area* (m2);

(v) unconditioned area* (m2);

(vi) vertical façade area (m2);

(vii) total surface area, including above grade walls, below grade walls, slab, exterior wall area, window area, and roof area; and

(viii) volume of Modelled Floor Area (m3);

** Use ASHRAE 90.1 definition of conditioned, semi-conditioned and unconditioned spaces.*

Inputs:

(a) Detailed summary of all Energy Model inputs and assumptions. Include assumptions and parameters not described, or that deviate from those described herein with a rationale and solution used for any deviation.

(b) Describe thermal zoning and the zoning approach used in the Energy Model.

(c) Description of occupancy density by room type, the total occupancy of the building, the occupancy schedules if more than one is applied.

(d) Description of set-points for temperatures, system resets, temperature of heating and cooling air delivered air to zones, temperature of water for heating coils and cooling coils, set point temp for ventilation air delivered.

(e) Description of all schedules applied in the model.

(f) Describe the building enclosures:

i. assemblies and insulation materials,

ii. description of the continuity of the insulation on all orientations;

iii. describe clips, fasteners and attachments as applicable;

iv. nominal and effective thermal performance of assemblies,

v. include BETBG calculation,

vi. U-value, solar heat gain coefficient of windows,

vii. Window to wall ratio by orientation;

viii. doors and skylights;

ix. description of the continuity of the air barrier design;

x. Describe below-grade assemblies including nominal and effective thermal performance, insulation thickness and type, and f-factors applied where applicable; and

xi. Include project specific assembly-specific heat flow models if applicable.

(g) Description of modelled building mechanical systems,

i. Overview description of the HVAC approach that includes but may not be limited to, the heating system(s), the cooling system(s), ventilation system(s) and service hot water system(s).

ii. Include all components including but may not be limited to, chillers, heat pumps, geoexchange system components, boilers, pumps, heat rejection, fans, air distribution, terminal equipment, heat recovery systems, equipment capacities, efficiencies and operating conditions including rates, temperatures and pressures.

iii. Description of modelled geoexchange system capacity, the portion of annual and peak heating and cooling served by the geoexchange system, ground temperature fluctuations during the year as a result of the application of the geoexchange system, the static ground temperature before geoexchange disturbance, the maximum and minimum seasonal operating temperatures, a description of the system control sequence, the contribution of the backup / peaking heating and/or cooling system, if applicable;

iv. Describe part load efficiency curves applied in the model;

v. Description of ventilation system(s), minimum ventilation flow rate, maximum ventilation flow rate, ventilation controls, schedules, delivery temperatures, proportion (%) of ventilation supply air returned to the heat recovery device, the type of heat recovery device, heat recovery efficiency, any make up air systems.

vi. A description of HVAC components that are not confirmed by the Design and are inferred or assumed at any of the Energy Modelling Report deliverable stages. Describe what outstanding design data is remaining and where assumed parameters have been included in lieu of future details.

vii. Describe make up air units and ventilation requirements and rates that may be present in specialized classrooms that may include shops or laboratories.

viii. Describe ventilation flow rate and schedule so the total daily ventilation volume is stated for: i) classrooms, ii) woodworking shop, iii) automotive mechanics shop, iv) metal working shop, v) theatre, vi) cooking rooms, vii) science labs.

(h) Describe lighting power density by space and/or by space type. Describe the lighting controls and schedule the lighting will operate to;

(i) Describe exterior lighting power density and schedule including the total number of annual hours the exterior lighting operates for;

(j) A description of the service water total annual thermal load applied. Describe the temperature of the incoming water and the delivery temperature;

(k) Description of modelling methodologies, including description of any workarounds or post-processing of results made outside of software;

(l) Description of the plug loads by space or by space-type and the operating schedule(s).

(m) Description of any renewable energy generated on Site, capacity, annual energy generated.

(n) Describe the infiltration rate applied.

i. Describe the infiltration rate applied.

ii. Describe the infiltration rate applied for the whole building in total cfm for the building.

iii. Confirm that the infiltration rate is constant rate.

iv. Describe the equivalent air leakage rate at 75 Pa, in litres/second of flow per m^2 of façade and as air changes per hour.

v. If a Mid-Construction Airtightness Test or Final Airtightness Test has been completed, report the measured airtightness rate and describe how the model has incorporated the tested airtightness rate.,

vi. The infiltration rate used in the Energy Model will be consistent throughout the project and used for each Energy Model and Energy Modelling Report submittal (Schedule 8; Appendix 1 Section 1.11(i)).

vii. The infiltration rate targeted for construction will be different than the infiltration rate used to demonstrate energy code compliance in the Energy Model. The constructed airtightness will be based on the infiltration rate described in the NECB 2020.

viii. For the final post construction Energy Model and Energy Modelling Report, the TEUI results and GHGI results will be reported using both the infiltration rate applied in the Energy Model (as described in Schedule 8) and the measured infiltration rate. Energy compliance to the TEUI and GHGI will be assessed using the infiltration used for Energy Model (as described in Schedule 8; Appendix 1 Section 1.11(i)) and the measured infiltration rate (NECB 2020 method).

(o) Input Summary Reporting

Use the template provided in Table A7, or greater level of detail, to document key Energy Model inputs and assumptions, including details on optimization of Energy systems' operations, controls, and sequences to realize maximum system efficiencies. The information contained in the model inputs shall inform the building systems Commissioning process.

Outputs:

(a) Provide for review to the Owner:

i. Energy Modelling Report;

ii. Calculations and supporting documents to show calculations;

iii. Workarounds, if applicable;

iv. Electronic files of hourly results, including:

(A) Hourly energy use by fuel type by end-use (in excel)

(b) Describe the monthly peak heating load and monthly peak cooling load.

(c) Describe the portion of the heating peak and annual heating served by the geoexchange system and the portion of the cooling peak and annual cooling load served by the geoexchange system.

(d) Describe any unmet heating and/or cooling load hours on a zone-by-zone basis;

(e) Provide results, discussion and conclusions based on the results of the Energy Model.

(f) Describe any inputs that have been estimated or assumed or where details from the Design are not yet available.

(g) As per Results Tables provided in this Schedule 8 document, provide results as follows:

i. Table A1 Monthly Energy, Demand, GHG and Cost by fuel type;

ii. Table A2 Annual Energy Consumption by End-Use by fuel type and Total Energy;

iii. Table A3 Energy Use Intensity by End-Use ($kWh/m^2/yr$);

iv. Table A4: Greenhouse Gas Emissions by End-Use ($kgCO_2e/yr$);

v. Table A5:Greenhouse Gas Use Intensity by End-Use ($kgCO_2e/m^2/yr$);

vi. Table A6: Undisturbed Ambient and Monthly Ground Temperatures for Geoexchange System;

vii. Table A7: Modelling Inputs Summary Table.

viii. Alternative arrangements of Tables A1 through to A7 is acceptable should information sets be complete with regards to the information requested and is included in the alternative tables.

(h) Per Table A2, A3, A4, and A5, the Energy end-use breakdown includes the following:

i. interior lighting;
ii. exterior lighting;
iii. fans;
iv. pumps;
v. cooling and heat rejection;
vi. primary heating;
vii. secondary heating
viii. service water heating;
ix. receptacle loads;
x. process loads;
xi. elevators;
xii. miscellaneous; and
xiii. total;

(i) Identify for each end-use the Energy use by the fuel type, as described in (aa) above;

(j) Include the fossil fuel Energy use in GJ and MBTU, and electricity fuel Energy use by kWh and MBTU, and all Energy combined by MBTU. (Table A2)

(k) Identify and report the contribution from on-Site Renewable Energy Electricity Generation, if applicable.

i. Report the Energy results with and without a contribution from on-Site Renewable Energy Generation.

ii. Application of on-Site electricity generation cannot be applied to meet the TEUI or the GHGI targets. The proposed Design will have to achieve the Energy Target and Greenhouse Gas Emission Intensity Target without the contribution from on-Site Renewable Energy Electricity Generation.

iii. Identify and calculate the contribution from PM2.5 in g/GJ if combustion of biofuels (*i.*e., woody materials) are proposed;

(l) Peak heating and peak cooling conditions;

(m) Report Total Thermal Energy Demand Intensity (TEDI), as kWh/m2/yr;

(n) Provide the results of the U x A Calculation results for the Building compared to the U x A Target.

(o) Use the format of Tables A1, A2, A3, A4, A5, A6 and A7 for submission of the results in the Energy Modelling Report;

(p) Apply both the measured Final Airtightness Test result and the modelled airtightness / infiltration rate (Section 1.11(i)) in the Energy Model and report both in the Energy Modelling Report.

(q) Output Variable Reporting

i. At the discretion of the Owner, hourly output variables of the simulation will be submitted by the Design-Builder in electronic format. The hourly output for submission will include the list below. Additional data may be requested for completing a reasonable review of the results.

ii. Hourly data for Energy by End-Use by fuel type;

iii. Hourly data of infiltration for a typical space;

iv. Hourly data for ventilation for a typical space, for a typical classroom, for the woodworking shop, for the metalworking shop, for the automotive shop, for the home economics (food) room, for the theatre, for the science laboratory.

Model Conditions

1.5. **Weather File**

(a) Use the CWEC 2020 Weather File for Kelowna

(b) Weather Data for the future weather scenario shall be based on the 2050 Weather Data for Kelowna created by the Pacific Climate Impacts Consortium

1.6. **Energy Cost Input**

(a) Energy Cost is the total utility cost for any fuel used by the Building and will include rate charges, monthly or daily charges, demand charges, delivery charges, ratchet charges, municipal taxes, and any other fee or charge related to the deliver or use of Energy at the Building;

(b) The Energy Costs for electricity and natural gas are provided in Table 2;

(c) Include cost for other fuels as applicable.

1.7. **Greenhouse Gas Emission Factor**

(a) The Greenhouse Gas emission factor for the Energy Model is provided in Table 2.

(b) The Greenhouse Gas emission factor for the Energy Model for electricity is for BC Hydro and natural gas provided by FortisBC.

(c) The Greenhouse Gas Emissions will be calculated for all fuel used by the Building, excluding the Existing Gymnasium.

(d) Should other fuels be used, describe the emission factor for the fuel and calculate the associated Greenhouse Gas emission factor as applicable.

1.8. **Carbon Tax Cost**

(a) The cost of CO_2 emissions from fossil fuels in BC, also named the Carbon Tax, for natural gas are provided in Table 2 below.

(b) Should other fuels be used, describe the Carbon Tax rate applied to the fuel and calculate the associated Carbon Tax as applicable.

1.9. **Cost Inputs**

(a) Energy Costs & Carbon Tax are identified in Table 2. Carbon Tax is based on the current Carbon Tax rate of $65/t$CO_2$e.

(b) Carbon Tax for calculation of annual greenhouse gas emissions, is in Table 2. Pricing for other fuels used in the building should be stated in the Energy Modelling Report, and the reference to the price noted.

Table 2: Utility Rates and Emissions Factors

Utility / Emission	Energy Costs	Carbon Tax Costs [4]	Emission Factor (tonne CO_{2e} / MWh)[3]
Electricity[1-see note below]	Apply BC Hydro Large General Service rates		0.0115
Natural Gas [2-see note below]	Apply FortisBC Rate 2	$65/ton$CO_2$e	0.180

1. *Based on BC Hydro Large General Service. Rate applies when the annual peak demand is at least 150 KW and the annual electricity per year is more than 550,000 kWh.*
2. *Based on FortisBC Rate 2. Based on 2,000GJ or less of natural gas use.*
3. Electricity emission intensity factors for grid-connected entities for 2022- Province of British Columbia (gov.bc.ca)
4. Natural Gas Emissions Factor is based on 49.87 kgCO2/MWh https://www2.gov.bc.ca/gov/content/environment/climate-change/industry/reporting/quantify/electricity

1.10. **U x A Calculation**

(a) Complete the U x A Calculation in accordance with NECB Calculation for assessing "Simple Trade-off Path" for vertical façade. Refer to "Users Guide – National Energy of Canada for Buildings 2017" for details to complete the calculation.

(b) The U x A Calculation pertains only to vertical façade and excludes roof performance and slab performance.

(c) Apply the effective, clear field thermal performance value for the exterior wall(s) before the BETBG calculation is completed. Include all wall types in the design in the U x A Calculation.

(d) Include the U x A Calculation and U x A Calculation result in the Energy Modelling Report.

1.11. **Envelope Modelling Methodology**

(a) Nominal and effective thermal performance of all envelope components will be reported;

(b) The building envelope and effective thermal performance of the envelope will be assessed in accordance with the Building Envelope Thermal Bridging Guideline;

(c) Include exterior envelope dimensions in calculations, not including the cladding and rainscreen cavity. Glazing areas to represent the total area of the rough opening including glass and frame;

(d) Any windows, curtainwall, and spandrel walls must include the thermal bridging impact of framing and installation, using NFRC 100 Standard Procedures, Building Envelope Thermal Bridging Guide, and/or Fenestration Association of BC (FENBC) Reference Procedure for Simulating Spandrel U-Factors;

(e) Building opaque thermal performance must account for variations in construction types and assemblies, above and below-grade;

(f) Account for thermal bridging from major structural penetrations, such as balcony slabs, beams, girders, columns, and ornamentation or appendages that must completely penetrate the Building envelope to perform their intended function and in accordance with the BETBG;

(g) If a BETBG detail is not available to assess a specific assembly detail, produce a representative detail using thermal analysis modelling software;

(h) Account for thermal bridging from structural penetrations that partly penetrate the Building envelope assembly, such as slab edges;

(i) Infiltration: model infiltration at 0.25 (L/s)/m² of total gross above-ground wall and roof areas. Infiltration rate is in accordance with NECB 2015;

(j) For thermal bridges to be included and excluded, follow methodology outlined in City of Vancouver Energy Modelling Guideline v.2.0, Section 3. Overall opaque assembly U-values must be determined using the Enhanced Thermal Performance Spreadsheet (available from BC Hydro New Construction Program), performance data for clear fields and interface details from the Building Envelope Thermal Bridging Guide (BETBG), and the calculation methodology as outlined in the BETBG;

(k) Exterior, permanent shades, if part of the design, are to be included in the Energy Model; and,

(l) No interior shades will be modelled.

1.12. **Thermal Zones**

(a) Zoning Methodology:

(i) Thermal zones in the Energy Model are to reflect the zones in the Design, except in cases where doing so would cause simulation issues or inaccuracies, such as:

(A) zones served by single-zone equipment such as cooling fan coils and ventilation air provided by a central VAV system;

(B) large, open spaces served by multiple air terminals or supplemental HVAC units; or

(C) others, as may be identified by the Design-Builder, and is reported in the Energy Modelling Report, and will be subject to review by the Owner.

(b) Internal loads of thermal zones are to be based on the sum of internal loads applied to the spaces with the thermal zones.

(c) Schedules and temperature settings may be applied to thermal zones based on those of the dominant space when appropriate.

(d) Combination of like interior (core) zones are to follow the following criteria:

(i) same internal load density (lighting, plug and Process Loads, and occupancy);

(ii) same minimum outdoor air and supply air exchange rates;

(iii) served by the same air system and no zone supplemental equipment; and

(iv) same operating schedules.

(e) Combination of like exterior (perimeter) zones are to follow the following criteria:

(i) criteria (i) through (iv) per interior zones as outlined in Section 1.8(d);

(ii) same net floor area +/- 20%;

(iii) within a tolerance of 10%, zones have the same ratio of net floor area to: design cooling airflow; design heating airflow; and perimeter heating capacities;

(iv) same exterior surface and window constructions, and shading elements;

(v) same ratio of net floor area to exterior wall and window areas within a tolerance of 10%, and all exterior surfaces facing directions:

(A) +/- 40° from true north; or

(B) within 10° for all other directions; and,

(vi) all zones are completely shaded, or all zones are completely unshaded by topographical features, other buildings, or by surfaces of the Building itself.

1.13. **Schedules and Setpoints**

(a) Schedules & Hours of Operation:

(i) all schedules applicable to the Energy Model are to be referenced from NECB 2015 and for specialty shop loads referenced in 1.17 (g), use schedules shown in Table A8 unless otherwise noted in Schedule 8 or Appendix 1 of Schedule 8.

(b) Room Set-Points:

(i) all space temperature and humidity setpoints are to be set as indicated in NECB 2015 and set by building type.

(c) The NECB schedule for schools is to be used for the following parameters:

(i) occupants;

(ii) lighting;

(iii) receptacle equipment;

(iv) service hot water; and

(v) NECB Fans Schedule for schools including NECB fan schedule for occupied and unoccupied hours.

(d) Apply BC Hydro schedules for:

(i) Mechanical rooms and electrical rooms; and

(ii) Storage.

(e) Exterior lighting will controls outlined in ASHRAE 90.1 2016.

1.14. **Mechanical System**

(a) Model the mechanical system as the Mechanical Engineer has designed the system. Including but not limited to, components, efficiencies, capacities, flow, motor power, operating and delivery temperatures.

(b) Confirm and state in the Energy Modelling Report the drawing package, or schedules applied to model the mechanical systems.

1.15. **Geoexchange System**

(a) Model the geoexchange system in accordance with the designers approach, design, and specifications;

(b) Describe ambient, undisturbed, deep ground temperature;

(c) Describe the annual ground temperature applied in the model including maximum and minimum temperatures (i.e., temperatures entering the heat pump);

(d) Describe the peak annual heating and cooling building load serviced by the geoexchange system;

(e) Describe the proportion of annual heating and proportion of annual cooling building load carried by the geoexchange system;

(f) Describe the expected contribution and proportion of peak and annual heating and cooling delivered from secondary or backup heating systems.

1.16. **Air Systems**

(a) Ventilation Rates:

(i) ventilation rates shall be modelled as per the Design; and

(ii) if applicable, demand control ventilation will be modelled at a minimum rate of 0.07 cfm/ft^2. The ventilation demand will be controlled using the NECB occupancy schedule.

(b) Air System Heat Recovery:

(i) air system heat recovery effectiveness is normally a function of the fraction of actual-to-nominal airflow. If the Energy Modelling Software's heat recovery

algorithm cannot accommodate adjusting the parameters of this function, the nominal effectiveness is to be adjusted so that the simulated effectiveness is less than or equal to the rated effectiveness throughout the range of airflow ratios; and

(ii) if an energy recovery device is incorporated in the Design, model both sensible and latent effectiveness if applicable.

(c) Controls:

(i) Controls must be modelled in alignment with anticipated operations, documented and described in Energy Modelling Report

(ii) Control sequence should be clearly described in the Energy Modelling Report for all systems that have a control sequence required to operate. The control sequence will align with the mechanical system Design and electrical system Design and provided to Independent Commissioning Agent.

1.17. **Internal and Miscellaneous Loads**

(a) Occupancy:

(i) on a space-by-space basis, NECB is to be referenced for occupant density, except for classrooms, drama/theatre, gymnasiums, multi-purpose room, and enclosed offices. Occupant density as follows:

(A) occupant density in classrooms will be modelled as 20 people per classroom. This includes specialty classrooms such as art, cooking, music, metal shop, automotive shop, woodworking shop, and similar, as applicable;

(B) occupancy density in the drama/theatre will be 30 people;

(C) occupancy density in the gymnasiums will be modelled as 25 people per gym;

(D) occupancy density in the multi-purpose room will be 40 people; and

(E) occupancy density in enclosed offices will be 1 person per office.

(b) Interior Lighting:

(i) interior lighting load and power density will be modelled as per Design.

(ii) Interior lighting and daylighting controls will be modelled based off requirements outlined in the NECB for each space type in the building.

(c) Exterior Lighting:

(i) lighting load as per Design.

(ii) Total kW with schedule based on photocell controls per ASHRAE 90.1-2016.

(d) Elevator Electricity Consumption:

(i) elevators will be 3 kW per elevator and will operate using the NECB receptacle schedule as per City of Vancouver (CoV) energy modelling guidelines.

(e) Service Water Heating:

(i) annual service hot water (SHW) consumption is to be 197 MWh of thermal energy, excluding efficiency of generation, and based on code-compliant fixtures;

(ii) SHW does not need to be applied at the zone level;

(iii) this load is to be applied to the SHW plant loop;

(iv) the SHW delivery temperature will be 60°C; and

(v) the SHW inlet temperature will be 5°C.

(f) Receptacle and Process Loads shall be modelled based off the receptacle loads outlined in NECB 2015 Table 8.4.3.2.(2).

(g) The following process loads, if applicable, will be modelled with the schedules outlined in Table A8:

(i) Sawdust collector

(ii) Air compressor for mechanic shop

(iii) CO/NOx exhaust systems for mechanic shop

(iv) Finishing paint booth exhaust for wood shop

(v) Welding exhaust system

(vi) Forge exhaust system

(vii) Fume hoods for home economics and science classrooms/labs

1.18. **Appended Tables**

These tables are to be used to show the Energy Model results.

A1 – Monthly Energy, Demand, Cost and GHG

A2 – Annual Energy Consumption by End Use

A3 – Energy Use Intensity by End Use

A4 – Greenhouse Gas Emission by End Use

A5 – Greenhouse Gas Emission Intensity by End Use

A6 – Monthly Ground Temperatures for Geoexchange

A7 – Modelling Input Summary Table

A8 – Prescribed Schedules

A1 – Monthly Energy, Demand, Cost and GHG

Table A1 Monthly Energy, Demand, Cost and GHG										
Table A1 Energy, Cost & Emission Summary	Total	Electricity		On Site Generated		Natural Gas		Combined		Greenhouse Gas
	Cost	Cost	Demand (kW)	Cost	Demand (kW)	Cost	Energy (GJ)	Cost	Demand (MBTU)	kg CO_2e
		Cost	Energy (MWh)	Cost	Energy (MWh)				Energy (MBTU)	
January										
February										
March										
April										
May										
June										
July										
August										
September										
October										
November										
December										
Annum										

A2 – Annual Energy Consumption by End Use

Table A2 Annual Energy Consumption by End-Use					
End Use	**Electricity kWh/yr**	**Electricity MBTU/yr**	**Natural Gas GJ/yr**	**Natural Gas MBTU/yr**	**Combined MBTU/yr**
Interior Lights					
Exterior Lights					
Fans					
Pumps					
Cooling					
Heating – Primary					
Heating - Secondary					
Service Water Heating					
Receptacles / Process Loads					
Elevators					
Miscellaneous					
Total					

A3 – Energy Use Intensity by End Use

Table A3 Energy Use Intensity by End-Use kWh/m^2/year			
End Use	**Electricity**	**Natural Gas**	**Electricity and Natural Gas Combined**
Interior Lights			
Exterior Lights			
Fans			
Pumps			
Cooling			
Heating – Primary			
Heating - Secondary			
Service Water Heating			
Receptacles / Process Loads			
Elevators			
Miscellaneous			
Total			

A4 – Greenhouse Gas Emission by End Use

Table A4 Greenhouse Gas Emission by End-Use kg CO_{2e}/year			
End Use	**Electricity**	**Natural Gas**	**Electricity and Natural Gas Combined**
Interior Lights			
Exterior Lights			
Fans			
Pumps			
Cooling			
Heating – Primary			

Heating - Secondary			
Service Water Heating			
Receptacles / Process Loads			
Elevators			
Miscellaneous			
Total			

A5 – Greenhouse Gas Use Emission Intensity by End Use

Table A5 Greenhouse Gas Emission Intensity by End-Use kg CO_{2e}/m^2/year			
End Use	**Electricity**	**Natural Gas**	**Combined (GHGI)**
Interior Lights			
Exterior Lights			
Fans			
Pumps			
Cooling			
Heating – Primary			
Heating - Secondary			
Service Water Heating			
Receptacles / Process Loads			
Elevators			
Miscellaneous			
Total			

A6 – Monthly Ground Temperatures for Geoexchange

Table A6 Undisturbed Deep Ground Temperature and Monthly Ground Temperatures for Geoexchange System		
Undisturbed Deep Ground Temperature		
Month	**Ground Temperature**	**Ground Temperature**
January	°F	°C
February	°F	°C
March	°F	°C
April	°F	°C
May	°F	°C
June	°F	°C
July	°F	°C
August	°F	°C
September	°F	°C
October	°F	°C
November	°F	°C
December	°F	°C

A7 – Modelling Input Summary Table

Inputs	Table A7 Modelling Inputs Summary Table
Software used and version	
Climate Zone & Weather File	
Building Floor Area and MFA	
Hours of operation	
Utility Rates & Emission Factors	
Electricity	
Gas	
Energy Center (DES)	
Other Fuel Sources	
Envelope Performance	
Roof R-value (nominal and effective) ($^oF \cdot ft^2/btuh$) and	For each type
Wall Above Grade R-value (nominal and effective) ($^oF \cdot ft^2/btuh$) and (m^2-K/W)	For each type
Wall Below Grade R-value (nominal and effective) ($^oF \cdot ft^2/btuh$) and (m^2-K/W)	For each type
Slab on grade insulation R-value and slab thermal performance ($^oF \cdot ft^2/btuh$) and (m^2-K/W)	
WWR Glazing (%)	
Glass U-value including frame and Solar Heat Gain Coefficient (SHGC)	For each type
Door performance (	
Shading Devices	
Infiltration Rate	
Internal Loads	
Occupant Density & Schedule	
Lighting Power Density & Schedule	
Interior Lighting Controls	
Exterior Lighting	
General Plug Loads & Schedule	
Process Loads & Schedule	
Elevators & Schedule	
Service Hot Water & Schedule	
Operating Conditions	

Room Set-points	Temperature, Humidity
Air Handling Units	Per AHU and MAU– list all that applies: Area it serves Min OA Flow and % of total Total Supply Air Flow Heating Coil Capacity Cooling Coil Capacity Reheat Coil Capacity Fan Power Supply Fan Power Return Fan Power Exhaust Supply Air Temperature Humidification Controls / Variable / Constant Volume / DCV
Heat Recovery Ventilators	Per HRV or ERV -list all that applies: Min OA flow Sensible efficiency % Latent efficiency % Fan power
Zone Terminal Systems	List all that applies for heating and cooling
Zone Exhausts	Per System: Air Flow Fan Power
Central Plant	
Heating Equipment Type	Type, Capacity, Efficiency, Temperature
Hot Water Loop	Per Hot Water Loop – list all that applies: Supply Water Temperature Return Water Temperature Description of Reset / Controls Heat Rejection/Heat Recovery
Cooling Equipment Type	Type, Capacity, Efficiency, Temperature
Chilled Water Loop	Per Chilled Water Loop – list all that applies: Supply Water Temperature Return Water Temperature Heat Rejection/ Heat Recovery
Heat Rejection	Type, Capacity, Efficiency, Temperature
Condenser Water Loop	Per Condenser Water Loop –list all that applies: Supply Water Temperature Return Water Temperature Heat Rejection/ Heat Recovery
Steam System	Type, Capacity, Efficiency, Temperature
Service Hot Water Preheat	Type, Capacity, Temperature
Service Hot Water	Type, Capacity, Efficiency, Temperature, Storage Capacity
Pumps	For all pumps: Flow, Power
Geoexchange	Field Size Portion of peak load served by geoexchange Portion of annual load served by geoexchange Operating temperatures of the field Maximum and minimum entering and leaving water temperatures

Other	
Renewable Energy Electricity Generation	List all that applies: Type, Capacity

A8 – Prescribed Schedules

	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	12pm	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm	12am
Electrical/Mechanical Room Lighting - BC Hydro App B																								
Monday-Friday	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114
Saturday	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114
Sunday / Holidays	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114
Storage Room Lighting - BC Hydro App B																								
Monday-Friday	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Saturday	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Sunday / Holidays	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Process Loads - Sawdust Collector, Exhaust Systems for Mechanic Shop, Paint Booth, Welding Stations and Fume Hoods																								
Monday-Friday	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0
Saturday	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sunday / Holidays	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Process Loads - Exhaust System for Forging Stations																								
Monday-Friday	0	0	0	0	0	0	0	0	0	0.75	0	0	0	0.75	0	0	0	0	0	0	0	0	0	0
Saturday	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sunday / Holidays	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Process Loads - Air Compressor																								
Monday-Friday	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Saturday	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sunday / Holidays	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

SCHEDULE 9

APPRENTICESHIP POLICY

1. APPRENTICESHIP POLICY

1.1 The Design-Builder acknowledges that it has obtained a copy of and has reviewed the Government of British Columbia policy set out in Apprentices on Public Projects 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 9 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 9 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 the ministry identified as responsible for the Apprenticeship Policy (the "***Responsible Ministry***"), to exercise all provisions of the Apprenticeship Policy applicable to the Contracting Authority or the Province (whether through the Responsible Ministry or otherwise) provisions that permit the Contracting Authority:

(a) to delay the start of Work on the Project until the Owner has confirmed, through the Responsible Ministry, 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 9 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 10

SITE PLAN

See separate document.

NORTH

SCHEDULE 10 SITE PLAN
1 : 600

station one architects
604 793 9445 Chilliwack 9355 Young Rd V2P 4S3 Abbotsford 203-2190 W. Railway St V2S 2E2

A1

DRAWING NAME
SCHEDULE 10 SITE PLAN

JOB NO. 22007
SCALE 1 : 600
DATE 2023.03.22

REVISIONS

NO.	DATE	DESCRIPTION

DRAWING NAME
GEORGE PRINGLE SECONDARY SCHOOL
3770 ELLIOT ROAD, WEST KELOWNA, BC

SCHEDULE 11

QUARTERLY LABOUR REPORTING

1. REPORTING OBLIGATIONS

1.1 The Design-Builder will prepare and submit a Quarterly Labour Report to the Owner concurrently with the third application for payment following the Effective Date and with every third monthly application for payment thereafter until the Substantial Completion Date for the Project. Each Quarterly Labour Report will comply with the following:

(a) the Quarterly Labour Report will be in the form set out in Section 2 of this Schedule 11 – Quarterly Labour Reporting or such other form as the Owner may require, acting reasonably;

(b) each Quarterly Labour Report will relate to the 90-day period prior to the date of the applicable application for payment;

(c) with respect to the "Indigenous Opportunities" column, the Design-Builder will report the aggregate value of contracts awarded to date to a contractor or business that has been identified as an "Indigenous Business" by the Westbank First Nation for purposes of the Project (collectively, the "***Indigenous Businesses***" and each, an "***Indigenous Business***");

(d) with respect to the "Local Workers" and "Underrepresented Group Employment" columns, the Design-Builder will request that all personnel engaged on the Project complete an anonymous survey at the time of their engagement on the Project, requesting that they self-report their identification with any of the following categories:

(i) British Columbia resident status (which is an individual who is physically present in British Columbia for a period of at least 6 months in the most recent calendar year);

(ii) women;

(iii) underrepresented groups, including visible minorities, persons with disabilities and LGBTQ2S+ (collectively, the "***Other Groups***");

(iv) individuals not self-identifying; and

(v) youth (under 19 years old);

The Design-Builder will conduct such further surveys of personnel engaged on the Project as necessary to ensure that the information in each Quarterly Labour Report remains accurate and up to date; and

(e) the Design-Builder will ensure that the information reported with respect to "Local Workers", "Apprenticeship Opportunities" and "Underrepresented Group Employment" columns, is reported:

(i) on an anonymous and aggregated basis only and in compliance with all applicable Laws; and

(ii) as a percentage of total hours worked on the Project in respect of the applicable 90-day period,

(collectively, the "***Quarterly Labour Reporting Requirements***").

2. FORM OF QUARTERLY LABOUR REPORT

Quarterly Labour Report										
Indigenous Opportunities	Local Workers	Apprenticeship Opportunities			Underrepresented Group Employment					Total Hours
Aggregate Value of Contracts with Indigenous Businesses	Total Hours of British Columbia Residents	Apprentices	Journey Persons	All Other Workers	Indigenous	Women	Youth	Individuals Not Self-Identifying	Other Groups	

SCHEDULE 12

DESIGN-BUILDER CODE OF CONDUCT

Construction Hours: Construction access hours will be consistent with any regulations in effect in the municipality in which the Site is located. The Design-Builder acknowledges that access may be limited by the reasonable requirements of the Owner.

Roadways: All speed limits and other traffic rules must be obeyed and access to the roadways should not be impeded.

Communication devices: Radio and cell phone volume will be at the minimum volume which is consistent with the ability to operate the device.

Animals: No dogs or other animals, are permitted at the Site without the written consent of the Owner.

Alcohol/Drugs: No alcoholic beverages or non-prescription drugs will be brought or consumed at the Site.

Cleanliness: The Site must be maintained for an orderly appearance on a daily basis. Trash and construction debris will be contained at all times and removed from the Site weekly.

Toilets: All temporary toilets will be screened with lattice and doors faced away from streets. In no cases will a worker utilize any washroom or other facilities at the Site, except as otherwise agreed in writing.

Smoking: There will be no use of tobacco, vaping, e-cigarettes, or consuming or smoking cannabis products on any Central Okanagan Public School property, within any Central Okanagan Public School building, or within any Board owned or leased vehicle. Refer to SD23 Board Policy "640 - District Smoke, Vapor, Cannabis Free Environment".

Storage: Storage will be in designated areas only.

Noise: After occupancy, or partial occupancy, noise levels should be kept to a minimum at all times. Equipment that generates noise should be adequately damped, silenced and soundproofed.

Identity Badges or Clothing: All workers will have an identity badge that clearly indicates the company's name and the individual's name. It is to be worn whenever at the Site.

Fitness for Work: All workers will be fit for work at all times. The Owner and the Owner's Consultant retain the right to request individuals leave the Site if unfit for any reason including inebriation, taking drugs, injury, fatigue, rudeness or any other reason that may affect the quality of the Work or represents a breach of these rules.

No Contact with Students: Workers will not contact students in any way, and will not stare or speak to or at any student.

Theft: Workers who steal from occupants or the Owner will be immediately ejected from the Site. The Design-Builder is responsible for all such thefts irrespective of whether the worker is an employee of the Design-Builder or a Subcontractor.

Security: After occupancy or partial occupancy, workers will be responsible for ensuring the security of the Site during access and for ensuring that locks are effectively and securely locked. Security doors will at all times remain closed and will not be propped open, even for a short time.

Owner's Policies: The Design-Builder will ensure that all Design-Builder Persons comply with all applicable policies of the Owner, including any policies which are contained in the Disclosed Data.