Cowichan District Hospital Replacement Project

Project Alliance Agreement

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Vancouver Island Health Authority

AND

EllisDon Corporation

Parkin Architects Western Ltd.

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Project Alliance Agreement dated as of September 9, 2022

Participants

Vancouver Island Health Authority a regional health board designated under the *Health Authorities Act* (British Columbia) (**Owner**)

AND

EllisDon Corporation, a corporation incorporated under the *Business Corporations Act* (Ontario) and extra-provincially registered in British Columbia; and

Parkin Architects Western Ltd., a corporation incorporated under the *Business Corporations Act* (Ontario) and extra-provincially registered in British Columbia,

(together the "**NOPs**")

Background

A The Owner is delivering the Cowichan District Hospital Replacement Project (**Project**) consisting of:

a. a replacement community-level hospital, with 204 inpatient beds;

b. a total building area of approximately 56,448 gross square metres;

c. capacity for core inpatient and ambulatory services, including a total of seven operating rooms (six ORs and one perinatal OR) and additional procedure rooms and outpatient/ambulatory clinic capacity, expanded diagnostic imaging, and expanded emergency department capacity;

d. a facility that will be LEED® gold certified with additional building features that will further reduce energy consumption and greenhouse gas emissions; and

e. associated upgrades to off-site civil works surrounding the area on Bell McKinnon Road.

B The Owner has determined that an alliance focusing on an integrated project team motivated by a value focused performance based incentive delivery approach is needed to achieve the Project Alliance Objectives for the Project.

C The Owner developed and implemented the Competitive Alliance Selection Process to select participants to form an alliance to deliver the Project.

D Through this competitive selection process the Owner has selected the NOPs.

E The Participants have agreed to form the Alliance in the manner and on the terms set out in this Agreement.

1. PURPOSE AND PRINCIPLES

Project Alliance Objectives

1.1 The purpose of our Alliance is to perform the Alliance Works to achieve the Project Alliance Objectives.

Alliance Principles

1.2 We agree that in performing the Alliance Works:

1.2.1 we will act in Good Faith;

1.2.2 all decisions will be made on a Best for Project basis;

1.2.3 we all win, or we all lose, based on project outcomes. Win-lose outcomes are not acceptable;

1.2.4 we will have a peer relationship where each Participant has an equal say in the decisions of the ALT;

1.2.5 all risks and responsibilities are managed collectively by the Participants;

1.2.6 we will have clear accountabilities within a no blame culture;

1.2.7 we will develop and foster a culture of trust, collaboration and innovation;

1.2.8 the ALT and the AMT are empowered to make decisions and take actions on behalf of all Participants;

1.2.9 all financial and commercial transactions are fully Open Book;

1.2.10 communication between us will be open and honest; and

1.2.11 all our dealings will be ethical and socially responsible.

2. OBLIGATIONS

2.1 In performing the Alliance Works, we will:

2.1.1 achieve the Project Alliance Objectives and the KRA Objectives;

2.1.2 ensure that the Alliance Works at Substantial Completion and Final Completion satisfy the requirements of this Agreement and are Fit for Purpose;

2.1.3 perform Alliance Works in a manner consistent with the Alliance Principles;

2.1.4 take collective responsibility for managing all of the risks in performing the Alliance Works;

2.1.5 manage and mitigate all of the risks involved in bringing the Alliance Works to Final Completion;

2.1.6 establish an integrated collaborative team environment to encourage open, honest and efficient working relationships;

2.1.7 comply with our No Dispute commitments and obligations;

2.1.8 encourage innovation and innovative thinking;

2.1.9 develop and maintain a high standard of consultation and communication with our stakeholders and immediate community groups;

2.1.10 create positive peer relationships in an environment of mutual support, appreciation and encouragement;

2.1.11 at all times exercise Good Industry Practice in the performance of Alliance Works; and

2.1.12 perform the Alliance Works to comply with the requirements of this Agreement.

3. NO DISPUTE

3.1 We will work cooperatively to avoid or to identify and resolve all Disputes.

3.2 We will immediately notify each other of any Dispute, or potential Dispute, arising out of or in connection with this Agreement. If the AMT is unable to resolve the Dispute acting in accordance with the Alliance Principles and Project Alliance Objectives, the Dispute will be promptly elevated to the ALT for resolution.

3.3 The ALT:

3.3.1 will deal proactively with any Dispute elevated to the ALT on a Best for Project basis;

3.3.2 must unanimously resolve any Dispute elevated to the ALT; and

3.3.3 will determine whatever action it believes is necessary to resolve the Dispute (which may include the appointment of an independent expert, mediator or adjudicator to assist the ALT to unanimously resolve any Dispute).

3.4 The rights, entitlements, obligations and liabilities set out in this Agreement (which in some cases may be determined by the ALT in the future) will exclusively govern our rights, entitlements, obligations and liabilities in relation to the Alliance Works.

3.5 To the extent permitted by law, we agree that only an act or omission of a Participant in performing, or failing to perform, the Alliance Works which amounts to a Wilful Default or an Act of Insolvency will give rise to enforceable obligations, entitlements, rights or remedies under this Agreement, including a right to claim or recover any Loss, or otherwise at law or in equity.

3.6 To the extent permitted by law, we release and discharge each other from any Loss, effects, claims, actions or proceedings under this Agreement or otherwise at law or in equity arising from or as a result of any act or omission in performing, or failing to perform, the Alliance Works which does not amount to a Wilful Default or an Act of Insolvency in respect of which we may have otherwise had recourse under this Agreement or otherwise at law or in equity but for this release and discharge.

3.7 The Participants agree that nothing in this Section 3 will operate to limit a Participant's statutory motor vehicle insurer exercising a right of subrogation or statutory right of recovery, to the extent it is permitted to do so, against a Participant or a Participant's insurer.

4. DIRECTIONS AND OWNER RESERVED POWERS

Directions

4.1 We acknowledge and agree that the Owner (in its discretion) or the ALT (in accordance with Section 4.2) may, by issuing a direction in writing to the Participants in accordance with this Section 4.1, direct us to:

4.1.1 change the Specifications or the Owner’s requirements for the whole or any part of the Alliance Works;

4.1.2 change the design of the whole or any part of the Alliance Works;

4.1.3 increase, decrease, delete or omit any part of the Alliance Works;

4.1.4 change the character or quality of any part of the Alliance Works;

4.1.5 change the levels, lines, positions or dimensions of all or any part of the Alliance Works;

4.1.6 change the timing of the performance of all or any part of the Alliance Works;

4.1.7 change the means, methods or techniques of the performance of all or any part of the Alliance Works;

4.1.8 execute additional Alliance Works; or

4.1.9 demolish or remove material, works, services or parts of the Alliance Works no longer required by the Owner,

and we will immediately comply with the direction. Any direction must clearly indicate that it is a direction issued by the Owner or the ALT, as the case may be, in accordance with Section 4.1.

4.2 If, prior to a unanimous determination of the ALT in respect of a direction proposed to be issued in accordance with Section 4.1, any ALT representative believes (acting reasonably) that the ALT should consult with the Owner prior to issuing the direction, the ALT will:

4.2.1 provide the Owner with a draft of the proposed direction together with detailed reasons substantiating the need for the proposed direction;

4.2.2 outline the impact of the proposed direction on the Specifications or Owner's requirements for the Alliance Works;

4.2.3 outline the impact of the proposed direction on the Project Alliance Objectives, the TOC or any KPIs; and

4.2.4 inform the Owner whether the proposed direction will constitute an Adjustment Event,

and the Owner and the ALT will, acting in accordance with the Alliance Principles, seek to agree on the issue of the proposed direction. Any proposed direction referred to the Owner in accordance with this Section 4.2 must, subject to Section 4.3, obtain the Owner's written consent prior to the ALT issuing the direction in accordance with Section 4.1.

4.3 We acknowledge and accept that notwithstanding Sections 4.1 and 4.2, the Owner may by exercising an Owner Reserved Power in accordance with Section 4.5.3, refuse its consent to any proposed direction by the ALT to be issued in accordance with Section 4.1.

4.4 No direction issued in accordance with Section 4.1 will:

4.4.1 invalidate this Agreement; or

4.4.2 unless the direction gives rise to an Adjustment Event, give rise to any adjustment to the Compensation Framework.

Owner Reserved Powers

4.5 We agree that determinations in respect of the following matters are reserved to the Owner in its discretion (each, an **Owner Reserved Power**):

4.5.1 any decision expressly reserved to the Owner under this Agreement;

4.5.2 a direction by the Owner issued in accordance with Section 4.1, including a direction by the Owner to delete, decrease or omit any part of the Alliance Works for any purpose, including engaging a third party to perform work that would otherwise be Alliance Works;

4.5.3 withholding or refusing consent to any proposed direction by the ALT to be issued in accordance with Section 4.1;

4.5.4 the appointment of independent advisors in accordance with Section 7.1;

4.5.5 issuing a Defect notice in accordance with Section 11.9;

4.5.6 a suspension of the Alliance Works under Section 15.4;

4.5.7 termination of this Agreement for the Owner's convenience in accordance with Section 16.1;

4.5.8 the rejection of, or a direction to amend, a notice issued in accordance with Section 17.8.3;

4.5.9 the exercise of any statutory rights, duties, powers or functions of the Owner in accordance with Section 18.8;

4.5.10 issuing any publicity or media statements or communications with respect to the Alliance or the Alliance Works in accordance with Section 21.9;

4.5.11 urgent protection of the Alliance Works, people, other property, or the environment; and

4.5.12 any other matter which the ALT unanimously agrees should be an Owner Reserved Power;

and we will immediately implement the exercise of any of the Owner Reserved Powers.

Owner's Representative

4.6 The Owner will perform its obligations under this Agreement through the Owner's Representative. The Owner's Representative will exercise the rights and entitlements reserved to the Owner under this Agreement. The Participants will provide all assistance necessary to enable the Owner's Representative to efficiently and effectively exercise the Owner's rights and entitlements and perform the Owner's role and responsibilities under this Agreement.

4.7 The Owner has initially selected the person identified in Schedule 1 as the Owner's Representative for the purposes of the Agreement. The Owner may, from time to time in its discretion, change the Owner's Representative by giving written notice to the NOPs. Any replacement Owner's Representative will be

bound by any earlier decision or determination made by any previous Owner's Representative, unless otherwise agreed by the ALT.

Perceived contravention of Law

4.8 If a Participant perceives that compliance with an Owner's direction issued under Section 4.1 would cause a Participant or a Participant's Officer, director or employee to do or omit to do anything that contravenes any Law, the Participant must immediately give notice in writing to the other Participants and the ALT providing the details of the Law and the manner so contravened. The ALT will consider the matters identified in the notice and:

4.8.1 satisfy the relevant Participant that the Owner's direction may be complied with, and agree to comply with the Owner's direction in such manner to avoid, manage or mitigate the risk of noncompliance; or

4.8.2 agree that the Owner's direction presents a real risk of contravening the Law and make a recommendation to the Owner addressing the Owner's direction and the possible contravention of the Law. The Owner will consider the ALT's recommendation and make a further direction after taking into account the ALT's recommendation

5. LEADERSHIP AND MANAGEMENT

ALT

5.1 The Participants have, by this Agreement, established the ALT. The ALT will:

5.1.1 comprise three ALT representatives appointed by the Owner, one ALT representative appointed by each NOP, one ALT representative appointed by IBC in accordance with Section 5.25.1 and one ALT representative appointed by BCIB in accordance with Section 5.28.1;

5.1.2 establish and implement the strategic leadership and direction of the Alliance;

5.1.3 establish and implement transparent governance and accountability structures for the Alliance; and

5.1.4 remain accountable to the Participants for the performance of the Alliance and the Alliance Works.

5.2 The ALT will comply with the ALT Accountabilities and Responsibilities Matrix.

Representation

5.3 Each Participant has appointed the representatives identified in Schedule 4 as its ALT representative.

5.4 We promise to each other that our ALT representatives have, in accordance with and subject to this Agreement, the power delegated to them, or have been otherwise authorized, to represent and bind the Participant on any matter relating to the Alliance and this Agreement. Where a substitute or delegate attends an ALT meeting in accordance with Section 5.8, that substitute or delegate has the powers of an ALT Representative in accordance with Section 5.4 as if they were appointed by a Participant as an ALT representative under Section 5.3.

5.5 Every ALT determination will be made unanimously on a Best for Project basis. Every ALT determination is binding upon the Participants.

ALT Meetings

5.6 A quorum for an ALT meeting requires the attendance of two ALT representatives of the Owner and one ALT representative appointed by each NOP.

5.7 Each of us acknowledge that our ALT representatives' continuous representation on, involvement in, and attendance at the ALT meetings is critical to the success of our Alliance.

5.8 We each commit to a principle of not removing or replacing our ALT representatives and not allowing substitutes or delegates to attend ALT meetings, other than in the event of a personal conflict of interest or in exceptional circumstances.

5.9 We will comply with the procedures and requirements for ALT meetings set out in Schedule 4.

AMT and WPT

5.10 The AMT is an integrated project management team formed by us to enable us to perform the Alliance Works.

5.11 The APM is appointed by the ALT to lead the AMT. The APM will comply with the APM Accountabilities and Responsibilities Matrix.

5.12 The ALT will, in consultation with the APM, appoint each member of the AMT on a best person for the job basis to create an integrated project team. Each of us will not remove any of our people appointed to the AMT or any of the Key Individuals without the ALT's consent.

5.13 The ALT may, as required by the progress of the Alliance Works, or as recommended by the APM, alter the composition and size of the AMT.

5.14 The WPT is an integrated project team to perform the Alliance Works on a Best for Project basis.

Personnel

5.15 We will ensure that all persons engaged in connection with the performance of Alliance Works:

5.15.1 will perform their role in the Alliance acting in a manner consistent with the Alliance Principles;

5.15.2 are careful, skilled, qualified and experienced in their respective trades and professions and suitably qualified and experienced in the type and nature of work they are undertaking to perform the Alliance Works;

5.15.3 are registered and licensed as necessary under any Law for the purposes of, or incidental to, the performance of the Alliance Works;

5.15.4 have been inducted by the Alliance in accordance with the Alliance's orientation program; and

5.15.5 will comply with this Agreement.

5.16 The Participants acknowledge and accept that if the ALT or the APM (in each instance acting reasonably) is of the opinion that a person does not or has not met the requirements of Section 5.15, the ALT or the APM (as the case may be) may direct the removal of any person from a Site or the Alliance Works.

5.17 We will ensure that any person subject to a direction under Section 5.16 does not become involved in the performance of the Alliance Works in any capacity without the written consent of the ALT.

Key Individuals

5.18 We will ensure that the Key Individuals specified in Schedule 8 are involved in the Project until Substantial Completion or such longer period as the ALT determines is required.

5.19 If a Key Individual becomes the subject of a direction under Section 5.16, is no longer employed by a Participant or is unable to perform the Alliance Works due to death, illness or incapacity, the Participant who is the employer of that person will promptly notify the ALT of that fact and provide details of an alternative, suitably qualified and experienced person to replace the relevant Key Individual.

5.20 The ALT will notify the Participant in writing within 10 Business Days as to whether or not it accepts the replacement individual proposed by the Participant in accordance with Section 5.19 as an acceptable replacement Key Individual. If the ALT does not accept the person proposed by the Participant as an acceptable replacement Key Individual, the Participant must nominate another person as a proposed Key Individual. We agree that that ALT is not required to state any reasons why a person proposed by a Participant is not an acceptable replacement Key Individual.

5.21 A Participant may only replace a Key Individual for reasons other than those outlined in Section 5.19 if the ALT is satisfied:

5.21.1 as to the qualifications and experience of the proposed replacement member of the Key Individual; and

5.21.2 that the replacement of the Key Individual will not adversely affect the quality of the relationship between the Participants or the performance of the Alliance Works in accordance with this Agreement.

5.22 We agree that if a Key Individual, for any of the reasons identified in Sections 5.16, 5.19 or 5.20, ceases to be involved in the Alliance Works, the ALT may agree that the role previously performed by that person is no longer required to be performed.

Infrastructure BC

5.23 The Owner has collaborated with IBC for the purposes of championing the alliance contracting model for the procurement and delivery of the Project.

5.24 The Owner has formed the view that it is in the best interest of all Participants to engage with and to leverage the expertise, experience and relationships of IBC within the Government of British Columbia and the wider construction and infrastructure market for the benefit of the delivery of the Project and the implementation of alliance contracting as a delivery model for projects in British Columbia.

5.25 The Owner has elected to exercise its discretion to:

5.25.1 invite IBC to nominate a permanent IBC representative to participate in all discussions, considerations and decisions of the ALT on a Best for Project basis "as if" IBC was a "Participant"; and

5.25.2 invite IBC to offer nominated personnel to perform roles in the AMT and Wider Project Team on a Best for Project basis.

5.26 By executing this Agreement the Participants acknowledge and accept:

5.26.1 the role of IBC under the Agreement; and

5.26.2 the IBC's representative's participation in all discussions, considerations and decisions of the ALT.

BCIB

5.27 We acknowledge and accept that:

5.27.1 BCIB has entered into the Community Benefits Agreement; and

5.27.2 BCIB and the Owner will enter into the Employee Supply Agreement providing BCIB, subject to the terms of the Community Benefits Agreement, the sole and exclusive right to provide employees covered by the Community Benefits Agreement to the NOPs (and any Subcontractors of any tier) who will perform work or provide services at the Site in respect of the Project.

5.28 The Owner has elected to exercise its discretion to:

5.28.1 invite BCIB to nominate a permanent BCIB representative to participate in all discussions, considerations and decisions of the ALT on a Best for Project basis "as if" BCIB was a "Participant"; and

5.28.2 invite BCIB to offer nominated personnel to perform roles in the AMT and Wider Project Team on a Best for Project basis.

5.29 By executing this Agreement the Participants acknowledge and accept:

5.29.1 the role of BCIB under the Agreement; and

5.29.2 the BCIB's representative's participation in all discussions, considerations and decisions of the ALT.

6. GOVERNANCE AND ALLIANCE MANAGEMENT SYSTEM

Governance Framework

6.1 The Alliance Governance Framework for the Alliance comprises:

6.1.1 this Agreement;

6.1.2 the Owner's reserved powers and directions in accordance with Section 4;

6.1.3 the leadership and management functions of the ALT, APM and AMT in accordance with Section 5 including the obligation to comply with the:

(a) ALT Accountabilities and Responsibilities Matrix; and

(b) APM Accountabilities and Responsibilities Matrix; and

6.1.4 the development and implementation of the Alliance Management System.

6.2 We will implement and comply with the Alliance Governance Framework.

Alliance Management System

6.3 The Alliance Management System will:

6.3.1 incorporate the Alliance Management Plans outlined in Schedule 7;

6.3.2 be provided to the ALT on a "rolling basis" for consideration and review as soon as practicable, and in any event within the period outlined in Schedule 7 or such other date agreed by the ALT; and

6.3.3 if determined by the ALT as being acceptable for the performance of the Alliance Works, be approved by the ALT.

6.4 Alliance Works will not commence on Site until the ALT determines that all such Alliance Management Plans necessary to control, manage and govern the performance of the Alliance Works proposed to be undertaken are developed and are approved by the ALT in accordance with this Agreement.

6.5 If the ALT does not approve an Alliance Management Plan, the ALT will provide reasons to the APM for any Alliance Management Plan it does not approve. The AMT will amend the Alliance Management Plan to address the reasons given and resubmit the Alliance Management Plan for approval.

Compliance with Alliance Management System

6.6 In performing the Alliance Works we will comply with, and not deviate from, the Alliance Management System approved in accordance with Section 6.5 unless such deviation is determined as acceptable by the ALT in advance of any such deviation.

Alliance Management System Updates

6.7 We will update and revise the Alliance Management System when necessary to do so as a result of any:

6.7.1 material change in the circumstances of the performance of the Alliance Works or that otherwise necessitates or requires a change to the Alliance Management System;

6.7.2 change in equipment, systems or procedures in performing the Alliance Works; or

6.7.3 or when directed by the ALT.

All updates and revisions to the Alliance Management System will be prepared and approved in accordance with Sections 6.3 and 6.5.

Post Implementation review

6.8 The Participants will, progressively during the performance of the Alliance Works, collect and report to the Owner such information and documentation that may be reasonably required by the Owner for the preparation of a post implementation review report.

7. ASSURANCE

Appointment of Advisors

7.1 We acknowledge that the Owner will appoint advisors including:

7.1.1 fairness or financial advisors, auditors or investigators;

7.1.2 construction, engineering or technical advisors;

7.1.3 cost planners, estimators and auditors; and

7.1.4 any additional expert or advisor,

to perform tasks requested by the Owner to report on the performance of the Alliance Works in accordance with this Agreement.

7.2 We acknowledge and accept that any advisor appointed under Section 7.1:

7.2.1 is accountable to the Owner to assist the Owner's governance and oversight of the Alliance;

7.2.2 may be replaced or have its role amended by the Owner;

7.2.3 will be paid by the Owner and such cost or expense will not be an Owner Alliance Cost or aggregated into the TOC or AOC; and

7.2.4 notwithstanding that the Owner's advisors will closely interact with the NOPs, does not owe any duty of care or any other legal duty, liability or obligation to a NOP.

Maintenance of Records

7.3 The Participants acknowledge and agree that:

7.3.1 the Owner, as a public body, has obligations to maintain control of all documentation and Records prepared by us for the purposes of performing the Alliance Works to substantiate the expenditure of public monies; and

7.3.2 the Owner retains legal and beneficial ownership and custody of all documentation and Records prepared by us for the purposes of performing the Alliance Works.

7.4 We will, during the performance of the Alliance Works and for the period set out in Section S1.6 of Schedule 1 from the Final Completion Date:

7.4.1 ensure that Records are properly and accurately created and maintained:

(a) on an Open Book basis;

(b) in a form that is capable of audit; and

(c) in accordance with GAAP;

7.4.2 not destroy or discard Records except with the Owner's prior written consent;

7.4.3 ensure that Records are available for inspection and verification by the Owner or any of its officers, agents, employees, or advisors upon reasonable notice being provided;

7.4.4 provide all other reasonable assistance requested by the Owner or any of the Owner's officers, agents, employees, and advisors for the purposes of inspecting the Records or conducting an audit; and

7.4.5 provide the Owner, upon reasonable notice being provided, with copies of all Records that the Owner determines (acting reasonably) it requires for the purposes of investigating, inspecting or auditing Records in accordance with Section 7.4 or 7.9 or the expenditure of public monies with respect to the performance of Alliance Works.

7.5 The Participants acknowledge that:

7.5.1 the Owner does not assume or owe any duty of care to any Participant to review Records for errors, omissions or compliance with the requirements of this Agreement or by Law; and

7.5.2 an inspection of Records will not:

(a) limit or relieve the Participants of, any obligation or liability under this Agreement;

(b) limit any right of the Owner under this Agreement;

(c) constitute acceptance by the Owner of the performance of the Participants' obligations under this Agreement; or

(d) be considered as a representation or acknowledgement by the Owner that the document complies with the requirements of this Agreement.

7.6 Notwithstanding any other provision of this Section 7, each NOP may retain its working papers and one copy of the Records, subject to the provisions of this Agreement relating to ownership, confidentiality and Intellectual Property persisting.

7.7 To enable the Owner to comply with its obligations we will, for the period set out in Section S1.6 of Schedule 1 from the Final Completion Date:

7.7.1 maintain a full and accurate set of:

(a) accounting Records following GAAP recording all Limb 1 Reimbursable Costs incurred in performing the Alliance Works; and

(b) all other documentation and Records prepared or received by us for the purposes of performing the Alliance Works; and

7.7.2 maintain all documentation and Records prepared by us for the purposes of performing the Alliance Works in a format which satisfies the Owner's requirements and supports access, preservation, accessibility and audit.

7.8 We will:

7.8.1 provide the Owner access to all documentation and Records prepared for the purposes of performing the Alliance Works (including any copies) for the period set out in Section S1.6 of Schedule 1 from the Final Completion Date; and

7.8.2 transfer to the Owner all documentation and Records prepared for the purposes of performing the Alliance Works of the type and at the intervals set out in the document control and Records management plan and in any event prior to the Final Completion Date.

Audit

7.9 The Owner, the Auditor General of British Columbia or any person appointed or allowed by either of them, may at any time until the expiry of the period set out in Section S1.6 of Schedule 1 from the Final Completion Date audit, inspect or investigate Records, the Site or any Other Site prepared or maintained by a Participant for the purpose of the Alliance Works.

7.10 We will provide whatever access or facilities are necessary to conduct any such audit, inspection or investigation.

7.11 Any Records provided, or to which any person has access, for the purposes of any audit, inspection or investigation will, subject to Law, be treated as Confidential Information in accordance with Sections 21.1 to 21.4.

7.12 We acknowledge and agree that:

7.12.1 the Auditor General of British Columbia or any person appointed or allowed by the Owner may at its discretion elect to audit, inspect or investigate any Record prepared or maintained by a Participant for the purposes of performing the Alliance Works; and

7.12.2 subject to Law, Sections 7.9 to 7.12 inclusive will apply to any such audit, inspection or investigation by the Auditor General of British Columbia.

7.13 If an audit, inspection or investigation in accordance with Section 7.9 identifies that any payments under this Agreement are less than, or exceed, a Participant's entitlement, then, as the case may be:

7.13.1 the Owner will pay the NOPs any shortfall;

7.13.2 the relevant NOP will reimburse the Owner any excess; or

7.13.3 the relevant amount may be the subject of a set-off by a Participant in accordance with Section 8.8 or 8.9, as the case may be,

in accordance with this Agreement, plus any GST paid or payable in respect of the shortfall or excess.

7.14 If an audit, inspection or investigation in accordance with Section 7.9 identifies that the Owner's Alliance Costs advised by the Owner to the APM are less than or exceed the actual Owner's Alliance Costs incurred by the Owner, the Owner will allocate any shortfall to the Alliance or set off or deduct any excess against the AOC.

7.15 In the event of an audit, inspection or investigation by the Auditor General of British Columbia or any person appointed or allowed by the Auditor General of British Columbia Sections 7.13 and 7.14 apply notwithstanding that Final Completion has occurred, this Agreement has been terminated and whether an audit, inspection or investigation is carried out under this Agreement or otherwise.

8. COMPENSATION FRAMEWORK AND PAYMENT

Overview of Compensation Framework

8.1 Each NOP will be compensated in accordance with the Compensation Framework.

Payment Claim

8.2 At the end of each month, by a date determined by the ALT, each NOP will prepare a monthly progress payment report (in a format and including such information and documentation determined by the ALT) detailing the amount payable to that NOP in accordance with Compensation Framework and submit the monthly progress payment reports to the APM. The Participants acknowledge and agree that the monthly progress payment report will, for the purposes of ascertaining the NOP personnel Reimbursable Costs in accordance with Schedule 5, include:

8.2.1 an updated organisation chart identifying all non-wages personnel performing Alliance Works in the month the subject of the monthly progress payment report;

8.2.2 a resourcing schedule(s) identifying, for all non-wages personnel performing Alliance Works in the month the subject of the monthly progress payment report:

(a) the NOP that is the employer of each person;

(b) the equivalent full time employment basis of each person;

(c) evidence (in accordance with the requirements of Schedule 5) of the period of time performing Alliance Works in the relevant month; and

(d) Not Used.

8.3 The monthly progress payment reports under Section 8.2 will include a statutory declaration by a representative of EllisDon Corporation in the form of CCDC 9A.

8.4 Within seven Business Days of the NOPs' submission of the monthly progress payment reports to the APM, the APM will:

8.4.1 consolidate the monthly progress payment reports;

8.4.2 prepare and sign a Progress Payment Schedule substantially in the form set out in Schedule 6;

8.4.3 procure that the Payment Certifier signs the Progress Payment Schedule signed by the APM; and

8.4.4 for any monthly progress payment report that includes any Limb 3 payment of gainshare by the Owner to the NOPs or Limb 3 payment of painshare by the NOPs to the Owner (as the case may be) procure that an ALT representative of each Participant signs the Progress Payment Schedule signed by the APM and the Payment Certifier:

and issue the signed Progress Payment Schedule to the Owner certifying the amounts payable to each NOP in accordance with this Agreement.

8.5 Within two Business Days of the date of issue of the signed Progress Payment Schedule, the APM will obtain an invoice from each NOP in the amount certified as payable in accordance with Section 8.4 and submit the payment certificate and the invoices to the Owner for payment.

8.6 The Owner, subject to the Owner's entitlement in Section 8.8 and within 15 Business Days of receiving the Progress Payment Schedule in accordance with Section 8.4, will pay to each NOP the amount certified for payment to each NOP in the Progress Payment Schedule plus any amount payable for GST by electronic funds transfer to the bank account or bank accounts (as the case may be) nominated in writing to the Owner. If Section 168(3)(c) of the *Excise Tax Act* is applicable on any payment remaining to be invoiced by a NOP to the Owner at Substantial Completion a NOP will have the right, and the Owner will be required to pay, the GST applicable to the payment subject to Section 168(3)(c) of the *Excise Tax Act*.

Payments on Account

8.7 We acknowledge and accept that:

8.7.1 the payment process in this Section 8, other than Section, 8.4, 8.8 and 8.9, may be adjusted by the ALT from time to time; and

8.7.2 payments by the Owner are payments on account and:

(a) are not evidence that the whole or any part of the Alliance Works have been performed in accordance with this Agreement; and

(b) are subject to audit in accordance with the procedure set out in Sections 7.9 to 7.13 inclusive.

Set-Off

8.8 The Owner may set-off from any amount payable to a NOP under this Agreement any amount due from that NOP to the Owner under this Agreement.

8.9 A NOP may set-off from any money which is payable by the NOP to the Owner under this Agreement, any amount payable by the Owner to that NOP under this Agreement.

Passing of Title

8.10 We will ensure that all rights, title and ownership in each part of any plant, materials, equipment, assets or items (for the purpose of Section 8.10 and 8.11 '**Materials**') that form part of, or are to be incorporated into, the Alliance Works, will pass to the Owner unencumbered and free of any liens, charges and encumbrances held or claimed by any third party, upon the earlier of:

8.10.1 installation or affixing of the Material into or on the Site; or

8.10.2 payment by the Owner of the payment claim of which the relevant Materials form part.

Payment for Unfixed Materials

8.11 We will ensure that when payment is requested for any unfixed or off-site plant, materials, equipment or goods that the ALT satisfied that:

8.11.1 in respect of Materials supplied directly by a NOP:

(a) clear and unencumbered title will pass to the Owner upon payment; and

(b) the unfixed Materials are properly stored, labelled and identified as the property of the Owner and that they are adequately insured noting the interests of the Owner;

8.11.2 in respect of Materials supplied directly by a Subcontractor, unless otherwise determined by the ALT, that:

(a) the Subcontractor has paid for the Materials and that clear and unencumbered title will pass to the Owner upon payment; and

(b) the Subcontractor has provided security in the form of an unconditional bank undertaking or unconditional letter of credit in the form approved by, and in favour of, the Owner equal to the amount claimed for the Materials. The unconditional bank undertaking or unconditional letter of credit (as the case may be) will be released upon delivery of the relevant Materials to the Site and the Subcontractor providing evidence and documentation which establishes that unencumbered ownership has passed to the Owner; and

(c) the Materials are properly stored, labelled and identified as the property of the Owner and that they are adequately insured noting the interests of the Owner.

Builders Lien Act

8.12 The Owner will retain and release the Lien Holdback in accordance with the provisions of the BLA.

8.13 For purposes of the BLA, the Payment Certifier will be the payment certifier for this Agreement.

8.14 We will submit applications to the Payment Certifier for certification of completion under the BLA, and will provide the Payment Certifier with all information required by the Payment Certifier for this purpose.

8.15 We will 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 us or a Subcontractor.

Owner Alliance Costs

8.16 The Owner Alliance Costs will be treated in the manner set out in the Compensation Framework.

9. ALLIANCE WORKS

Commencement

9.1 The Alliance Works will not commence prior to a date advised by the Owner, which in any case will be no earlier than the Commencement Date.

Design Development

9.2 In performing the Alliance Works we will ensure that any designs for the Alliance Works:

9.2.1 satisfy the Owner's requirements for the Alliance Works and the Project;

9.2.2 are such that, when constructed, the Alliance Works will be Fit for Purpose and of the quality and standard of work required by this Agreement;

9.2.3 satisfy the performance and operational requirements required by this Agreement;

9.2.4 are performed by personnel who, at all times, remain suitably qualified and experienced and exercise Good Industry Practice;

9.2.5 optimize whole of life cost for the Alliance Works having regard to the various design lives of each component of the Alliance Works and the Owner's requirements; and

9.2.6 are developed and submitted to the Owner in accordance with the Design Management Plan and in a structured and timely manner to enable the Participants to seek all necessary review and approvals for the Alliance Works.

Standard of Construction

9.3 In performing construction works or services forming part of the Alliance Works we will ensure that:

9.3.1 the Alliance Works will be Fit for Purpose and of the quality and standard of work required by this Agreement;

9.3.2 they are performed by personnel who, at all times, remain suitably qualified and experienced and exercise Good Industry Practice;

9.3.3 they are of the highest quality consistent with the Project Alliance Objectives;

9.3.4 they satisfy the performance and operational requirements, and are otherwise performed, in accordance with this Agreement.

Access to a Site

9.4 We will ensure that:

9.4.1 to the extent that we enjoy rights of access to a Site we will provide such access to each other and any person engaged, or employed by us or any one of us, as is necessary or appropriate for the performance of the Alliance Works;

9.4.2 to the extent that we do not enjoy rights of access to a Site we will secure sufficient access that is necessary or appropriate for the performance of the Alliance Works on a Best for Project basis; and

9.4.3 the Site and the Alliance Works and the means of access to and egress from the Site and the Alliance Works are such that persons who are at the Site and the Alliance Works, or use the Site and the Alliance Works or a means of access to or egress from the Site and the Alliance Works, are not exposed to hazards.

9.5 Where the Owner provides access to any part of a Site such access is provided on the basis that:

9.5.1 we will comply with all reasonable requirements, restrictions and directions of the Owner;

9.5.2 we will maintain the Site and any other lands and places required to perform the Alliance Works in a safe, clean and tidy condition;

9.5.3 at Substantial Completion we will remove all Construction Plant, Temporary Works, surplus materials and rubbish from the Site and leave it in a safe, clean and tidy condition; and

9.5.4 the Owner, its employees and agents and any other person nominated by the Owner, may at any time, subject to compliance with the Alliance Management System, have access to any part of the Site for any purpose.

9.6 Unless otherwise determined by the Owner, we will not mobilize our resources or establish any accommodation, facilities or presence on any part of the Site before the date determined by the Owner in Section 9.1

Protection of people and property

9.7 In performing the Alliance Works we will:

9.7.1 provide all things and take all measures necessary to protect people and property;

9.7.2 avoid unnecessary interference with people or property;

9.7.3 prevent damage to and unlawful obstruction or unlawful interference with people or property;

9.7.4 prevent nuisance and unnecessary obstruction, interference or disturbance with people or property;

9.7.5 ensure that so far as is reasonably practicable persons are not exposed to risks to their health and safety arising from the Alliance Works; and

9.7.6 prevent unlawful environmental damage or pollution.

Subcontracting

9.8 If any of us enter into a Subcontract with a Subcontractor for the performance of any part of the Alliance Works, we will do so in accordance with the Procurement and Contracting Management Plan within the Alliance Management System.

9.9 Where a Participant enters into a Subcontract with a Subcontractor for the performance of any part of the Alliance Works:

9.9.1 the Participant will do so in its own right as principal;

9.9.2 if required by the Owner, the Participant will require the third party to enter into a direct agreement with the Owner, so that the Owner may exercise all rights under the Subcontract on and from Substantial Completion;

9.9.3 to the extent that Section 9.9.2 does not apply, the Participant will ensure that prior to Substantial Completion, the benefit of the Subcontract is assigned, or otherwise transferred, to the Owner, so that the Owner may exercise all rights under the contractual arrangement or agreement on and from Substantial Completion;

9.9.4 we collectively assume the risk of the performance of the Subcontractor under the Subcontract; and

9.9.5 the performance of the Subcontractor under the Subcontract will not relieve us of our obligations under the Agreement.

9.10 The Owner and Parkin acknowledge and accept that EllisDon has final decision-making authority on behalf of the Participants with respect to implementing and managing prequalification procedures for Subcontractors, entering into Subcontracts, settling any dispute with a Subcontractor, placing Subcontractors on notice of default, defining what is required of the Subcontract to cure a default, defaulting Subcontractors and responding to defaulted Subcontractors.

Stakeholder and Community Relations

9.11 We are committed to developing deeply engaged stakeholder consultation and communication practices with genuine commitment and responsiveness.

9.12 We are committed to doing everything within our power to ensure that our employees, subcontractors, consultants and agents are genuinely sensitive and responsive to all local and broader community issues that may arise during the performance of the Alliance Works.

9.13 We will immediately inform the ALT and the Owner of any local or broader community issue which relates to the performance of the Alliance Works and will promptly follow any instructions from the Owner in respect of that issue.

9.14 We will take all steps necessary to meet the Owner's obligations and commitments to our local community and stakeholders as they relate to the performance of the Alliance Works.

Testing and Commissioning

9.15 We will ensure that all testing and commissioning of the Alliance Works is carried out in accordance with the Commissioning Plan and completed as required by and in accordance with this Agreement (including the requirements of Schedule 2) and any applicable Laws.

9.16 All testing and commissioning which is required to be performed in accordance with this Agreement (including the requirements of Schedule 2) to achieve Substantial Completion will be:

9.16.1 performed and completed by the Participants;

9.16.2 certified and or licensed in accordance with the requirements of Law; and

9.16.3 certified by the APM as having been performed and successfully completed,

prior to Substantial Completion.

10. COMPLIANCE

Laws

10.1 We will satisfy and comply with all Laws relating to the Alliance Works. We will obtain all permits, approvals, authorizations and consents required by any Laws necessary for the performance of the Alliance Works.

10.2 We understand and acknowledge that the Owner has obtained or may obtain, for the purposes of the Alliance Works a number of licences, permits or regulatory approvals. We will, in performing the Alliance Works, observe the requirements and obligations of these licences, permits or regulatory approvals and will ensure that we, and our employees, subcontractors and agents, do not do anything that in any way prejudices or affects the Owner’s rights and obligations and entitlements under these licences, permits or regulatory approvals.

Work Health and Safety

10.3 Throughout the performance of the Alliance Works we are committed to:

10.3.1 the development of a safe and respectful workplace to ensure the health, safety and wellbeing of our people;

10.3.2 proactively preventing any form of bullying, harassment or discrimination, and actively encouraging diversity and inclusion in each workplace performing any part of the Alliance Works;

10.3.3 safety being as equally important as any commercial objective; and

10.3.4 creating a safe workplace and doing everything necessary to maintain a workplace free of accidents and injury.

10.4 We will ensure the health and safety of all persons engaged by us, including all workers, as defined in the OHS Legislation, to perform any aspect of the Alliance Works, including taking all steps necessary to:

10.4.1 provide and maintain a working environment where people are not exposed to hazards;

10.4.2 provide and maintain workplaces, plant and systems of work of a kind that do not expose persons to hazards;

10.4.3 provide information, instruction, training and supervision of all people as is necessary to enable them to perform their work or services in such a manner that does not expose them to hazards;

10.4.4 provide people with adequate personal protective clothing and equipment so as to protect them against hazards to their occupational health and safety;

10.4.5 consult with workers and consult, co-operate and co-ordinate with other duty holders in accordance with the OHS Legislation;

10.4.6 ensure that:

(a) the use, operation, cleaning, maintenance, transportation and disposal of plant; and

(b) the use, handling, processing, storage, transportation and disposal of substances,

are carried out in such a manner that people are not exposed to hazards;

10.4.7 develop procedures for dealing with emergencies that may arise while persons are at work;

10.4.8 ensure so far as is reasonably practicable that the health and safety of members of the public are not placed at risk by the performance of the Alliance Works; and

10.4.9 do all things necessary to ensure that, in respect of any plant or equipment to be used in the performance of any Alliance Works:

(a) a system is implemented and maintained to identify any hazards associated with any plant or equipment, and assess the risks of a person being exposed to those hazards; and

(b) all practical measures are taken to reduce those risks,

in order to ensure that the duties of employers to provide and maintain a safe working environment in relation to plant and equipment is performed successfully and effectively.

10.5 Prior to commencing the Alliance Works, each Participant will provide the ALT with satisfactory written evidence of compliance by it with all requirements under the OHS Legislation, including payments of assessments due under it to WorkSafeBC. Without limiting the foregoing, the ALT may at any time require that any Participant provide evidence of compliance with all requirements under the OHS Legislation, or payment of assessments due under it to WorkSafeBC, or both.

Prime Contractor

10.6 We acknowledge and accept that for the purposes of the performance of the Alliance Works:

10.6.1 the Owner appoints EllisDon Corporation as the 'Prime Contractor' for the purposes of the performance of the Alliance Works;

10.6.2 the Owner gives all necessary authority to EllisDon Corporation to discharge the duties of a Prime Contractor under the OHS Legislation and to enable it to manage or control any workplace to the extent necessary to discharge the duties imposed on a Prime Contractor;

10.6.3 subject to Section 10.6.7, EllisDon Corporation acknowledges and agrees that it accepts the appointment and will be responsible for, and bear the responsibility of, all obligations as the 'Prime Contractor';

10.6.4 EllisDon Corporation will:

(a) exercise and fulfil the functions and obligations of the Prime Contractor;

(b) file any documents necessary to comply with the OHS Legislation, including a notice of project;

(c) comply with all Laws and other requirements of this Agreement concerning the OHS Legislation;

(d) ensure that we perform our obligations under this Agreement in a manner which ensures we satisfy our obligations under the OHS Legislation and all occupational health and safety requirements established by EllisDon Corporation to fulfil EllisDon Corporation's obligations as Prime Contractor;

(e) ensure that all Participants and Subcontractors comply with their respective obligations under the OHS Legislation and with all occupational health and safety requirements established by EllisDon Corporation to fulfil EllisDon Corporation's obligations as Prime Contractor, and will ensure that all Subcontractors coordinate and schedule their construction activities at the Site in accordance with the reasonable instructions of EllisDon Corporation;

(f) at all reasonable times provide the Owner and any relevant Authority with access to any Records necessary to establish EllisDon Corporation's compliance with its obligations under this Section and the OHS Legislation;

(g) immediately inform the ALT and the Owner of all incidents involving injury to any person arising out of or in connection with the performance of the Alliance Works; and

(h) provide the ALT and the APM with a copy of any document, notice or report that EllisDon Corporation, as the Prime Contractor, is required to author or that it receives;

10.6.5 we will coordinate and schedule our construction activities at the Site in accordance with the reasonable instructions of EllisDon Corporation;

10.6.6 each Participant will do anything, and will refrain from doing all things, necessary to allow EllisDon Corporation to fulfil and exercise its obligations and functions as Prime Contractor; and

10.6.7 if EllisDon Corporation, for any reason, is no longer capable of discharging its obligations as 'Prime Contractor', the Owner will revoke the appointment of EllisDon Corporation and will appoint a replacement 'Prime Contractor'.

Protection of the Environment

10.7 We are committed to implementing and pursuing environmental practices in a manner consistent with Good Industry Practice in performing the Alliance Works and will do everything necessary to ensure that we minimize all environmental impacts.

10.8 We will take all steps necessary to minimize impacts on the environment in performing the Alliance Works including by:

10.8.1 providing and maintaining systems, means, methods and techniques of working that minimize environmental impact;

10.8.2 ensuring that any plant or equipment used on a Site is so arranged, designed, made and maintained so that it minimises environmental impact;

10.8.3 ensuring that environments that we encounter or engage with are not exposed to risks of unlawful damage or pollution;

10.8.4 developing and complying with procedures for:

(a) avoiding and responding to environmental hazards or emergencies (or potential environmental hazards or emergencies); and

(b) avoiding or mitigating risks of unlawful damage or pollution that may arise; and

10.8.5 developing procedures for engaging with any Authority regarding the environment.

Indigenous and cultural heritage

10.9 We are committed to the protection of indigenous and cultural heritage and indigenous rights and will ensure that our employees, subcontractors, consultants and agents are genuinely sensitive and responsive to any indigenous and cultural heritage issues or indigenous rights that may arise during the performance of the Alliance Works.

10.10 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)), we will:

(a) immediately notify the Owner;

(b) take all steps not to disturb the item and, if necessary, suspend construction activities to the extent required if performing those construction activities would endanger the item 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 all requirements of governmental authorities with respect to such discovery, including pursuant to the Heritage Conservation Act (British Columbia).

11. CARE, SUBSTANTIAL COMPLETION AND FINAL COMPLETION

Care of Alliance Works

11.1 From and including the Commencement Date until 4:00pm on the Substantial Completion Date we are responsible for the care of the Alliance Works and the Site.

11.2 From 4:00pm on the Substantial Completion Date until Final Completion, we are responsible for:

11.2.1 the care of any outstanding Alliance Work, Defects, Construction Plant or Temporary Works remaining on the Site and other such work as provided by this Agreement; and

11.2.2 any loss or damage to:

(a) the Alliance Works or the Site;

(b) any property of the Owner on or adjacent to the Site; and

(c) any property of any third party,

arising out of or in connection with a Defect or the rectification of Defects or the performance of Alliance Works.

11.3 At all times until Final Completion we:

11.3.1 are responsible for any loss or damage to any property of a Participant or any third party arising out of or in connection with the Alliance Works;

11.3.2 are responsible for any loss of use arising as a consequence from such loss or damage; and

11.3.3 will repair or reinstate any such loss or damage.

11.4 The cost to rectify, repair, reinstate or make good any loss, damage or Defect or to take care under Sections 11.1 to 11.3 will be Limb 1 Reimbursable Costs in accordance with Schedule 5.

Substantial Completion of Alliance Works

11.5 We will perform the Alliance Works to achieve Substantial Completion by the Target Substantial Completion Date.

11.6 When the AMT is satisfied that Substantial Completion has been achieved the APM will deliver a Substantial Completion Report to the ALT:

11.6.1 certifying that the Alliance Works have achieved Substantial Completion; and

11.6.2 documenting that the Alliance has complied with the requirements of this Agreement for Substantial Completion.

11.7 The ALT will meet as soon as practicable after receipt of the Substantial Completion Report to consider whether Substantial Completion has been achieved. If the ALT considers that Substantial Completion:

11.7.1 has been achieved, the ALT will issue a Certificate of Substantial Completion stating the Substantial Completion Date; or

11.7.2 has not been achieved, the ALT will identify those matters or things which need to be addressed before Substantial Completion can be achieved and the process in Sections 11.6 and 11.7 will be repeated until the ALT issues a Certificate of Substantial Completion stating the Substantial Completion Date.

Substantial Commissioning of Alliance Works

11.5A We will perform the Alliance Works to achieve Substantial Commissioning by the Target Substantial Commissioning Date.

11.6A When the AMT is satisfied that Substantial Commissioning has been achieved the APM will deliver a Substantial Commissioning Report to the ALT:

11.6A.1 certifying that the Alliance Works have achieved Substantial Commissioning; and

11.6A.2 documenting that the Alliance has complied with the requirements of this Agreement Substantial Commissioning.

11.7A The ALT will meet as soon as practicable after receipt of the Substantial Commissioning Report to consider whether Substantial Commissioning has been achieved. If the ALT considers that Substantial Commissioning:

11.7A.1 has been achieved, the ALT will issue a Certificate of Substantial Commissioning stating the Substantial Commissioning Date; or

11.7A.2 has not been achieved, the ALT will identify those matters or things which need to be addressed before Substantial Commissioning can be achieved and the process in Sections 11.6A and 11.7A will be repeated until the ALT issues a Certificate of Substantial Commissioning stating the Substantial Commissioning Date.

Defect Rectification

11.8 We will rectify and make good any Defect in the Alliance Works prior to Final Completion.

11.9 The Owner or the ALT may:

11.9.1 at any time prior to Final Completion, direct us in writing to attend to the rectification of any Defect; and

11.9.2 state a date for the commencement of the rectification of a Defect and whether there will be a separate Defect Correction Period for that Defect (which if so, will commence at 4:00pm on the date the rectification of the Defect is completed and will expire six months after that date).

11.10 The cost of making good any Defect acting in accordance with Section 11.9 will be a Limb 1 cost (for costs incurred by a NOP) and an Owner Alliance Cost (for costs incurred directly by the Owner) in accordance with the Compensation Framework.

Final Completion of the Alliance Works

11.11 The AMT will notify the ALT when the APM is satisfied that Final Completion has been achieved.

11.12 The ALT will meet as soon as practicable after receipt of the notice in Section 11.11 to consider whether Final Completion has been achieved. If the ALT considers that Final Completion:

11.12.1 has been achieved, the ALT will issue a Certificate of Final Completion stating the Final Completion Date;

11.12.2 has not been achieved, the ALT will identify those matters or things which need to be addressed before Final Completion can be achieved and the process in Sections 11.11 will be repeated until issue a Certificate of Final Completion stating the Final Completion Date.

11.13 The Participants acknowledge and agree that prior to, and as a precondition to:

11.13.1 Substantial Completion, the NOPs will provide the Owner with all Records required by the Owner to conduct a post implementation review and prepare a post implementation report ; and

11.13.2 Final Completion, the NOPs will provide the Owner with any supplementary or additional Records required by the Owner to finalize the post implementation report.

Separable Portions

11.14 The Owner may determine that any part of the Alliance Works will be a separable portion and the interpretations of:

11.14.1 Alliance Works;

11.14.2 Defect Correction Period;

11.14.3 Certificate of Substantial Commissioning;

11.14.4 Certificate of Substantial Completion;

11.14.5 Substantial Commissioning;

11.14.6 Substantial Completion;

11.14.7 Target Substantial Commissioning Date;

11.14.8 Target Substantial Completion Date;

11.14.9 Substantial Commissioning Date;

11.14.10 Substantial Completion Date;

11.14.11 Defects; and

11.14.12 Final Completion,

will apply separately to each separable portion.

12. ADJUSTMENT EVENTS

Adjustment Events

12.1 When the ALT is considering whether an event or circumstance is an Adjustment Event, they will act consistently with this Section 12.

12.2 The Participants have agreed to share all risks and opportunities associated with the Alliance Works, regardless of whether:

12.2.1 those risks or opportunities are within the control of the Participants;

12.2.2 the Participants could (or should) reasonably have foreseen or made allowance for them; or

12.2.3 any provision that was made for them in the Target Outturn Cost,

except for those risks or opportunities (or portions of such types of risks or opportunities) that the Participants have specifically agreed will be retained solely by the Owner as indicated in the Adjustment Event Guidelines.

12.3 The Participants acknowledge that:

12.3.1 the types of scenarios in the Adjustment Event Guidelines for which a risk or opportunity is shared are not exhaustive;

12.3.2 the types of scenarios in the Adjustment Event Guidelines for which a risk or opportunity is retained unilaterally by the Owner is exhaustive; and

12.3.3 there are no other types of events or circumstances for which a risk or opportunity is retained unilaterally by the Owner, except for events or circumstances expressly stated elsewhere in this Agreement to be an Adjustment Event.

Adjustment Event Approval Process

12.4 No adjustment to the Compensation Framework in respect of an Adjustment Event will be made unless and until the ALT has approved the Adjustment Event.

12.5 Any adjustment to the Compensation Framework in respect of an Adjustment Event that has been approved by the ALT will be calculated in accordance with the Compensation Framework.

13. INTELLECTUAL PROPERTY

Intellectual Property Rights and obligations

13.1 The Participants' rights and obligations relating to Intellectual Property are set out in Schedule 11.

Perpetual obligation

13.2 The NOPs' obligations set out in Schedule 11 are perpetual, and survive the suspension, termination, expiry or completion of this Agreement. If a NOP sells any NOP's Existing IPR or any Enhancement to a NOP's Existing IPR, the NOP will ensure that these obligations bind each successor in title to the NOP's IPR, so far as is relevant to, or required by, this Agreement.

Non-Infringement

13.3 In performing the Alliance Works we promise to each other that:

13.3.1 our Existing IPR and the use of our Existing IPR; or

13.3.2 the Enhancement by us of Existing IPR; or

13.3.3 the use of New IPR,

for the purposes of the Alliance Works or to use, support, maintain, repair, renovate, or operate the Alliance Works or the Project, do not and will not infringe the IPR of any third party.

14. INSURANCE

General

14.1 The Participants will obtain and maintain the insurance specified for each of them under the Insurance Conditions, and will otherwise comply with the Insurance Conditions.

14.2 Unless otherwise recommended by the ALT and endorsed in writing by the Owner, before beginning the Alliance Work, each Participant will deliver to each other Participant copies of all insurance coverage obtained by the Participant in accordance with the Insurance Conditions, or such other proof of that insurance as is satisfactory to the ALT. This obligation will not apply in relation to the Course of Construction Insurance required pursuant to Section S13.9 of Schedule 13 where such proof of insurance shall be provided on or before November 1, 2022 unless otherwise recommended by the ALT and endorsed in writing by the Owner.

Cross liabilities and waiver of Subrogation

14.3 Where an insurance policy under this Agreement is obtained and maintained in more than one name, the policy of insurance must provide that:

14.3.1 except with respect to the limits of insurance, and any rights or duties specifically assigned to the indemnified entities and insofar as the policy may cover more than one indemnified entity, all insurance policy agreements and endorsements will operate in the same manner as if there were a separate policy of insurance covering each party comprising the indemnified entity and that a

failure by one indemnified entity to disclose all material circumstances will not prejudice the rights of any other indemnified entity to indemnity under the policy or cover; and

14.3.2 that the insurer waives all rights, remedies or relief arising out of or in connection with this Agreement to which it might become entitled by way of subrogation against any of the parties constituting the indemnified entity and that failure by any indemnified entity to observe and fulfil the terms of the policy or covers will not prejudice the insurance or covers in regard to any other indemnified entity.

Pass Through

14.4 To the extent that any Participant receives payment under an insurance policy that reimburses any cost loss or expense that was reimbursed or is reimbursable under this Agreement, that Participant must pass on that payment to the Owner in full, and within a further 28 days the Owner must do each of the following:

14.4.1 arrange for an audit in accordance with Section 7.9 to 7.14 inclusive to take account of the insurance pass through amount received under the policy; and

14.4.2 issue further payments to the NOP, if required by the audit, in accordance with Section 7.13.

Maintaining insurance and notices

14.5 In relation to the policies to be effected by a Participant under our Agreement each Participant will:

14.5.1 ensure that insurance premiums are paid on time and ensure the conditions of cover are otherwise complied with;

14.5.2 promptly notify the ALT of any proposed variation, amendment or endorsement to any insurance policy which adversely affects the amount, scope or terms of such policy and not effect, or consent to, any such variation, amendment or endorsement without the ALT's written approval;

14.5.3 immediately notify the Participants of any event which may result in any insurance policy lapsing (other than by expiry of the period of insurance and, where such policy is renewable or is renewed) or being cancelled or avoided;

14.5.4 promptly give written notice to the Participants if an insurer gives notice of cancellation, avoidance or other notice in respect of any insurance policy; and

14.5.5 immediately give written notice to the Participants of any intention by a Participant to cancel or intentionally let lapse any insurance policy.

14.6 In relation to the insurance policies required to be effected by a Participant under this Agreement the Participant:

14.6.1 will not do, or omit to do, anything which might vitiate, impair or derogate from the cover or prejudice any claim under any such insurance policy;

14.6.2 will give notice to the Participants as soon as practicable after discovery that a term, condition or section of any insurance policy has been breached;

14.6.3 will as soon as practicable notify the Participants of any occurrence that may give rise to a claim and which could materially reduce the available limit under any such insurance policy and thereafter keep the Participants informed of developments concerning the claim; and

14.6.4 will promptly notify the Participants if, at any point, it fails to comply with any of its obligations under this Agreement.

14.7 In relation to the insurance policies required to be effected by a Participant under this Agreement other than owned automobile insurance the Participant will require each policy of insurance will bear an endorsement to the effect that the insurer will not effect any cancellation of the policy without first giving at least 30 days prior written notice by registered mail to the Owner and each of the other named insureds and loss payees, provided that the Wrap-up Liability Insurance and the Course of Construction Insurance will each bear an endorsement providing that the policy is non-cancellable by the insurer except for the following:

14.7.1 non payment of the premium;

14.7.2 bankruptcy or insolvency of the named insured;

14.7.3 termination of the Project prior to the expiry date of the policy (termination does not refer to the early completion of the Project); or

14.7.4 indefinite suspension of the Project,

and the Wrap-up Liability Insurance and the Course of Construction Insurance will each bear an endorsement providing that the insurers will not effect any material adverse change to either such policy.

Insurances and covers primary

14.8 The Participants intend that any insurance policy required under the Insurance Conditions is to be primary to, and not coordinate, or be secondary or subordinate to, any other indemnity or payment required to be granted or made by the Owner or another Participant under, or in connection with, this Agreement.

14.9 The Participants acknowledge that if a claim is made by the Owner under an insurance policy required under the Insurance Conditions, it is the Participants' intention that the insurer cannot require the Owner to exhaust any indemnities referred to in this Agreement before the insurer considers or meets the relevant claim.

No Release

14.10 The Participants acknowledge that whether an insurance policy responds or not (irrespective of the reason for that failure to respond) does not in any way release the Participants from any of their obligations under this Agreement.

Wilful Default

14.11 In respect of any insurance policy effected by a Participant under the Insurance Conditions or for the purposes of the Alliance Works any act or omission by a Participant, or any of a Participant's officers, employees, agents or any other Person for whom a Participant is solely responsible, including:

14.11.1 any misrepresentation, non-disclosure of material circumstances or breach of the duty of utmost good faith; or

14.11.2 a deliberate or reckless failure to observe and fulfil the terms and conditions of any such insurance policy or cover,

that causes, in whole or in part:

14.11.3 a Participant's rights or entitlements in respect of any such insurance policy to be adversely affected or prejudiced; or

14.11.4 the insurance policy to be cancelled or avoided, or the benefits under the insurance policy to be reduced,

will be a Wilful Default for the purposes of this Agreement.

Notice of Potential Claims or Claims

14.12 The Participants must ensure that the ALT notifies the Owner of potential and actual claims on any insurance policy to be obtained and maintained in accordance with this Agreement. Where the potential or actual claim is made under any insurance policy obtained and maintained by the Owner in accordance with the Insurance Conditions, the ALT will ensure that the Participants comply with any reasonable requirements of the Owner (including the Owner's insurers and legal advisors) with respect to the management, administration and defence (as the case may be) of the potential or actual claim.

14.13 The Participants must ensure that the ALT keeps the Owner informed of subsequent developments or updates concerning potential and actual claims on an insurance policy obtained and maintained by the Owner in accordance with the Insurance Conditions.

15. SUSPENSION

Alliance suspension

15.1 Subject to Sections 15.3 and 15.4, the performance of the whole or any part of the Alliance Works will not be suspended by us unless the APM, the ALT or EllisDon Corporation in its capacity as the Prime Contractor considers suspension is necessary to prevent:

15.1.1 personal injury or death of people or loss of or damage to any property;

15.1.2 an adverse impact upon the environment, public health or safety or the community; or

15.1.3 a breach of a Law.

If we suspend the whole or any part of the Alliance Works for any of the above reasons we will recommence the performance of the Alliance Works when directed to do so by the ALT in accordance with Section 15.2.

15.2 As soon as:

15.2.1 the ALT is satisfied that the reasons for suspension in Section 15.1 no longer exist or have been appropriately managed or addressed, the ALT will direct us to recommence the suspended work as soon as reasonably practicable and we will promptly comply with that direction; or

15.2.2 EllisDon Corporation in its capacity as the Prime Contractor is satisfied that the reasons for suspension in Section 15.1 no longer exist or have been appropriately managed or addressed, EllisDon Corporation will notify the ALT to issue a direction under Section 15.2.1.

15.3 Other than in the event of an urgent event or circumstance which requires an immediate suspension of the whole or any part of the Alliance Works, EllisDon Corporation will consult with and use its best efforts to obtain the agreement of the ALT to any proposed exercise of its suspension right under Section 15.1.

Owner suspension

15.4 The NOPs accept that the Owner may without cause and for any reason at any time at the Owner's discretion issue a written notice directing the Participants to suspend the performance of the whole or any part of any Alliance Works for any time period as the Owner decides.

15.5 If the Owner issues a written notice of suspension under Section 15.4:

15.5.1 we will immediately suspend the performance of the Alliance Works that are the subject of the direction;

15.5.2 the APM will, within five Business Days of the direction, prepare for the ALT's consideration and approval, an appropriate Best for Project recommendation to manage our resources and protect the Alliance Works during the period of suspension; and

15.5.3 we will only recommence the performance of the suspended Alliance Works when directed to do so by the Owner.

15.6 We will use our best efforts to mitigate any Limb 1 Reimbursable Costs and Owner Alliance Costs incurred during any period of suspension.

16. TERMINATION FOR CONVENIENCE

Notice of Termination

16.1 Notwithstanding anything else in this Agreement the Owner may, by written notice, without cause and for any reason at any time in its discretion terminate this Agreement effective immediately or at any time thereafter identified in the notice upon service of the notice on the NOPs.

Compliance with Notice of Termination

16.2 Upon receipt of a notice of termination under Section 16.1, the NOPs will:

16.2.1 cease performing the Alliance Works and take all measures necessary to protect people, property and the Alliance Works; and

16.2.2 comply with any directions by the Owner to bring about an immediate winding down and cessation of the Alliance Works, such winding down to include:

(a) the protection and return of property (including the Alliance Works) in the possession or control of the Participants in which the Owner has, or may acquire, an interest;

(b) termination, assignment, transfer or novation to the Owner (at the Owner's determination) of all rights, benefits and obligations of any agreements or any interests in any arrangements entered into, acquired or created by the Participants, a NOP or the NOPs for the performance of any part of the Alliance Works;

(c) giving the Owner possession of all materials and other things on or about the Site which are owned or leased by the Participants and which are reasonably required by the Owner to achieve Substantial Completion and Substantial Commissioning (as the case may be) of the Alliance Works;

(d) giving the Owner ownership and possession of all items reasonably required by the Owner to achieve Substantial Completion and Substantial Commissioning (as the case may be) of the Alliance Works which have formed, or will form, part of any payment made or to be made by the Owner;

(e) vacating the Site of all Engaged Persons, Temporary Works, Construction Plant and other belongings of the Participants; and

(f) giving to the Owner any Records which the NOPs or any of their Engaged Persons have prepared prior to or as at termination as required by this Agreement. We agree that the Owner may use any such Records in its discretion.

Termination Payments

16.3 Subject to any rights the Owner has arising out of or in connection with this Agreement, including a right to withhold or set off payment and recover all amounts to which any of the NOPs may be liable under this Agreement, and subject to Section 16.8, in the event of termination in accordance with Section 16.1 the Owner will pay the NOPs, or the NOPs will pay the Owner as the case may be, the difference between:

16.3.1 the sum of:

(a) for the Alliance Works performed prior to the date of termination, amounts payable in accordance with the Compensation Framework in respect of:

(i) Limb 1 Reimbursable Costs;

(ii) Limb 2; and

(iii) Limb 3 (if any) determined on a just and equitable basis (including consideration of any relevant Owner Alliance Costs) by the ALT having regard to the performance of the Participants up to the point in time of the issue of the notice of termination, as if a notice of termination under Section 16.1 had not been issued;

(b) the Limb 1 Reimbursable Costs reasonably incurred by the NOPs for materials, plant and equipment reasonably ordered by the NOPs which the NOPs are legally liable to accept and pay for, but only if the materials, plant and equipment become the unencumbered property of the Owner upon payment;

(c) the Limb 1 Reimbursable Costs reasonably incurred by the NOPS in the reasonable expectation of performing the whole of the Alliance Works which the NOPs are legally liable to pay, including costs or damages incurred by reason of the NOPs having to terminate contractual arrangements with third parties that were entered into for the purposes of the Alliance Works;

(d) the reasonable Limb 1 Reimbursable Costs incurred in demobilizing from the Site; and

(e) the reasonable Limb 1 Reimbursable Costs incurred by the NOPs as a result of complying with any direction given by the Owner on or after termination; and

16.3.2 an amount equal to any amounts which the Owner has previously paid to the NOPs under this Agreement;

and the NOPs will not otherwise be entitled to recover, and release and discharge the Owner from, any and all Loss arising out of or in connection with this Agreement, the Alliance Works or the termination of this Agreement save and except for any entitlement to be indemnified by the Owner in accordance with Sections 16.6 and 17.13.

16.4 We will mitigate any costs, loss, expense or damages incurred or arising out of or in connection with a termination for convenience in accordance with Section 16.1.

Termination Documentation

16.5 In the event of termination in accordance with Section 16.1 the Participants will execute any documentation, including appropriate confidentiality requirements, licences and releases, reasonably requested by the Owner, to deal with and close out any acts, events, circumstances or issues arising out of or in connection with the termination of this Agreement.

16.6 We acknowledge and accept that, in the event of termination in accordance with Section 16.1, the Owner may use any documentation or information prepared by us for the purposes of, or arising out of or in connection with, the Alliance Works for any purpose whatsoever including engaging any third party or any NOP to perform all or any part of the Alliance Works. The Owner accepts the risk of, and subject to Sections 13.3 and 17.9, indemnifies the NOPs against the risk of using, or providing to third parties for their use, any such documentation or information.

Continuation of Alliance Works

16.7 Without prejudice to any of the Owner's rights, entitlements or powers under this Agreement, the Owner may, upon termination of this Agreement under Section 16.1, itself or by third parties, continue to perform and complete any incomplete Alliance Works.

Termination arising from Wilful Default

16.8 The participants acknowledge and agree that:

16.8.1 if a NOP commits a Wilful Default and fails to rectify the Wilful Default within the period stated in the Default Notice, the Owner may terminate this Agreement in accordance with Section 16.1 because of, in response to, as a consequence of, or to manage or mitigate the effects of the Wilful Default and/or the failure to rectify the Wilful Default;

16.8.2 if the Owner terminates this Agreement on the basis set out in Section 16.8.1:

(a) all references to the "NOPs" or a "NOP" in Section 16.3 will exclude the Defaulting NOP; and

(b) the Defaulting NOP will not be entitled to recover, and releases and discharges the Owner from, any and all Loss arising out of or in connection with the Wilful Default, this Agreement, the Alliance Works or the termination of this Agreement.

17. WILFUL DEFAULT AND INSOLVENCY

NOP Wilful Default

17.1 If a NOP prior to Final Completion commits a Wilful Default the Owner, after consultation with the ALT, may issue a written notice to the Defaulting NOP:

17.1.1 specifying details of the Wilful Default; and

17.1.2 requiring the Defaulting NOP to rectify the Wilful Default within 10 Business Days of the date of the Default Notice.

The Owner may prior to the expiry of the period stated in the Default Notice, extend in writing the period in the Default Notice to a longer period determined by the Owner (in its discretion) if the Owner is satisfied (acting reasonably) that the Defaulting NOP has demonstrated:

17.1.3 a genuine need for a period longer than 10 Business Days to rectify the Wilful Default; and

17.1.4 a bona fide intention and/or effort (as the case may be) to rectify the Wilful Default,

and such later period extended in writing by the Owner will be deemed to be the "period stated in the Default Notice" for the purposes of Section 17.2 and/or Section 16.8.1 (as the case may be).

Failure to Remedy a Wilful Default

17.2 If the Defaulting NOP fails to remedy the Wilful Default identified in the Default Notice within the period stated in the Default Notice, the Owner, after consultation with the ALT and without prejudice to any other rights it may have under the Agreement (including under Section 16.8.1) or otherwise at law, may at any time thereafter, by giving written notice to the Defaulting NOP, exercise one or more of the following rights:

17.2.1 wholly or partly suspend any payment, or any entitlement to payment of any Limb 1 Reimbursable Costs, Limb 2 or Limb 3 due or that may become due to the Defaulting NOP, whether or not the entitlement to payment arose on, before or after the date of the Default Notice, until the Default has been remedied;

17.2.2 exclude the Defaulting NOP from further participation in the Alliance or this Agreement; or

17.2.3 terminate any entitlement to payment of any Limb 1 Reimbursable Costs, Limb 2 or any Limb 3 to the Defaulting NOP occurring, or that may otherwise occur but for this Section 17.2.3, on and from the date of the Default Notice until the Default has been remedied.

17.3 Any notice issued to the Defaulting NOP under Section 17.2 will (subject to the terms of the notice) be effective immediately and is without prejudice to the Non-Defaulting Participants' rights against the Defaulting NOP under this Agreement or otherwise at law.

17.4 Notwithstanding any Wilful Default by a Defaulting NOP, but subject to any notice under Section 16.1, the Non-Defaulting Participants will continue to perform the Alliance Works.

NOP Act of Insolvency

17.5 If an Act of Insolvency occurs in respect of a NOP or its Guarantor the Owner, after consultation with the ALT, may at any time thereafter by giving written notice to the Defaulting NOP, exercise one or more of the following rights:

17.5.1 wholly or partly suspend any payment, or any entitlement to payment of any Limb 1 Reimbursable Costs, Limb 2 or Limb 3 due or that may become due to the Defaulting NOP whether or not the entitlement to payment arose on, before or after the date of the Default Notice until the Default has been remedied;

17.5.2 exclude the Defaulting NOP from further participation in the Alliance or this Agreement; or

17.5.3 terminate any entitlement to payment of any Limb 1 Reimbursable Costs, Limb 2 or Limb 3 to the Defaulting NOP occurring, or that may otherwise occur but for this Section 17.5.3, on and from the date of the Default Notice until the Default has been remedied.

17.6 Any notice issued to a Defaulting NOP under Section 17.5 will (subject to the terms of the notice) be effective immediately and is without prejudice to the Non-Defaulting Participants' rights against the Defaulting NOP under this Agreement or otherwise at law.

17.7 Notwithstanding any Act of Insolvency occurring in respect of a NOP or its Guarantor, but subject to any notice under Section 16.1, the Non-Defaulting Participants will continue to perform the Alliance Works.

Exclusion

17.8 If the Owner excludes a Defaulting NOP from further participation in the Alliance in accordance with Sections 17.2.2 or 17.5.2:

17.8.1 the Owner may:

(a) suspend until Final Completion any payment, or any entitlement to payment, of any Limb 1 Reimbursable Costs, Limb 2 or Limb 3 to the Defaulting NOP whether or not the entitlement to payment arose on or before the date of the Default Notice;

(b) terminate any future entitlement to payment of any Limb 1 Reimbursable Costs, Limb 2 or Limb 3 to the Defaulting NOP occurring, or that may otherwise occur but for this Section 17.8.1(b);

(c) use all Temporary Works, Construction Plant and materials provided by the Defaulting NOP to perform the remaining Alliance Works, without incurring any liability to pay or reimburse the Defaulting NOP for the use of such all Temporary Works, Construction Plant and materials; and

17.8.2 the Defaulting NOP:

(a) will promptly, as and when required by the ALT, assign, transfer or novate (as directed by the Owner) to the Non-Defaulting Participants without payment the benefit of any agreements or arrangements or any interests in any agreements or arrangements entered into by the Participants or any IPR owned or held by the Defaulting NOP required by the Non-Defaulting Participants for the performance of any part of the Alliance Works;

(b) will promptly, as and when required by the ALT, deliver to the ALT any documentation or information prepared by, or on behalf of, the Participants under this Agreement prior to the Default;

(c) will, as and when directed by the ALT (but not before), remove from the Site at the cost of the Defaulting NOP any Temporary Works, Construction Plant and other property of the Defaulting NOP. If the Defaulting NOP fails to do so then, not less than five Business Days after written notice to the Defaulting NOP of the intention to do so (but without being responsible for any loss or damage) the Non-Defaulting Participants may remove and/or sell any such Temporary Works, Construction Plant or other property and the proceeds of such sale will be available to be set-off, or accounted for by the Non-Defaulting Participants to reduce the AOC;

(d) will no longer be entitled to be represented on the ALT or the AMT or otherwise participate in our Alliance or the Project;

(e) will have no interest in the Alliance, this Agreement or the Alliance Works from the date of the Default Notice;

(f) waives any objection to any determination or decision under Section 17.8;

(g) releases and discharges the Non-Defaulting Participants from any Loss and any claims of builder's liens, builder's liens or certificates of pending litigation arising out of or in connection with any decision under Section 17.8 which it may have had but for this release and discharge;

(h) acknowledges and agrees that the Defaulting NOP appoints the Non-Defaulting Participants to act as agent for and on the Defaulting NOP's behalf (but excluding any duty of good faith as an agent) to do all such things on its behalf as are necessary for the performance of the Alliance Works; and

(i) notwithstanding Section 17.8.2(h), will execute such deeds and documents that the Non-Defaulting Participants decides are necessary for the completion of the Alliance Works; and

17.8.3 the ALT will notify the Owner of the manner by which the ALT proposes that the Non-Defaulting Participants will continue with the performance of the Alliance Works, including whether (and to what extent) any additional parties or resources may need to be engaged by the Non-Defaulting NOPs or the Owner (as the case may be) as a result of the exclusion of the Defaulting NOP.

Indemnity and Release

17.9 Notwithstanding any other provision of this Agreement, the Defaulting NOP will be liable for and will indemnify each Non-Defaulting Participant for:

17.9.1 any Loss suffered or incurred by the relevant Non-Defaulting Participant arising out of or in connection with the:

(a) relevant Wilful Default or Act of Insolvency by the Defaulting NOP;

(b) exclusion of the Defaulting NOP in accordance with this Section 17; and

(c) termination of this Agreement in accordance with Section 16.8.1;

17.9.2 the Defaulting NOP's share of any Limb 3 (as determined in accordance with the Compensation Framework) for the period prior to the relevant Wilful Default or Act of Insolvency which is payable by the Defaulting NOP; and

17.9.3 the Defaulting NOP's share of any Limb 3 suffered or increased (as determined in accordance with the Compensation Framework) or Limb 3 foregone or reduced (as determined in accordance with the Compensation Framework) for the period after the relevant Wilful Default or Act of Insolvency which is payable by the relevant Defaulting NOP as if:

(a) the Defaulting NOP had not been excluded from further participation in the Alliance;

(b) the Compensation Framework in place at the time of the Wilful Default or the Act of Insolvency remained in place and continued to operate with respect to the Defaulting NOP until Final Completion; and/or

(c) this Agreement had not been terminated as a result of the Wilful Default.

17.10 The Defaulting NOP releases and discharges each Non-Defaulting Participant from any Loss arising out of or in connection with:

17.10.1 a Wilful Default notified under Section 17.1;

17.10.2 an Act of Insolvency notified under Section 17.5;

17.10.3 any exercise by the Owner of any of the rights in Sections 17.2 or 17.5;

17.10.4 termination of this Agreement in accordance with Section 16.8.1; and

17.10.5 the indemnity in Section 17.9,

which the Defaulting NOP may have had but for the release in this Section 17.10.

17.11 For the purpose of this Section 17 any reference to the ALT, the Alliance or each Non-Defaulting Participant excludes:

17.11.1 the Defaulting NOP; and

17.11.2 any representatives of the Defaulting NOP appointed to the ALT in accordance with Section 5.3.

Owner Wilful Default

17.12 If the NOPs, acting in Good Faith as if they were the ALT in the absence of the Owner, unanimously determine that the Owner has committed a Wilful Default, the NOPs may give a unanimous written notice to the Owner specifying details of the Wilful Default and requiring the Wilful Default to be remedied by the Owner within 20 Business Days of the date of the notice.

17.13 If the NOPs, acting in Good Faith as if they were the ALT in the absence of the Owner, unanimously determine that the Owner has committed a Wilful Default, the Owner will indemnify the NOPs for:

17.13.1 Limb 1 Reimbursable Costs incurred;

17.13.2 Limb 2 on any Limb 1 Reimbursable Costs in Section 17.13.1; and

17.13.3 Limb 3 suffered or increased or forgone or reduced;

arising out of or in connection with the Wilful Default.

17.14 The NOPs acknowledge and accept that the indemnity by the Owner in Section 17.13 will be the limit of the NOPs' entitlements, and the Owner's liability or obligation, arising out of or in connection with an Owner Wilful Default. Each NOP releases and discharges the Owner from any Loss arising out of or in connection with the Owner's Wilful Default which the NOPs may have had but for this release in this Section 17.14.

Exclusion of Negligence Act

17.15 To the extent permitted by law, the Participants agree that *Negligence Act* (British Columbia) has no operation in relation to the obligations of a Participant under this Agreement.

18. RIGHTS AND OBLIGATIONS

Our Relationship

18.1 By forming the Alliance and by executing this Agreement we do not intend, and nor should we be understood, to have created any express or implied partnership, joint venture or fiduciary relationship between us.

18.2 We do not, except as may otherwise be set out in this Agreement or determined by the ALT, confer a right in any of us to enter any commitment on our behalf or to otherwise act as our agent.

18.3 Each of us is an independent entity and, for the purposes of this Agreement, the employees or agents of one of us will not be considered to be employees or agents of another, unless as otherwise deemed by Law, and we will each pay all costs associated with our respective employees.

Exclusive

18.4 To the extent permitted by law, we intend that the rights, obligations and liabilities set out in this Agreement will exclusively govern our rights and liabilities in relation to the Alliance Works. We agree that

it is our intention that we will have no other rights or remedies arising out of or in connection with the Alliance Works at law or in equity other than as set out in this Agreement.

Enforceable

18.5 It is our intention that this Agreement create rights between us enforceable only in accordance with the terms of this Agreement despite the fact that certain matters are to be determined by the ALT in the future.

18.6 Any provision of this Agreement which seeks to limit or exclude a right or liability is to be construed as doing so only to the extent permitted by law.

18.7 With the exception of:

18.7.1 an Act of Insolvency;

18.7.2 an act or omission that amounts to a Wilful Default; or

18.7.3 a liability under an indemnity in Sections 17.9 or 17.13,

we will not pursue the recovery of any Loss arising out of or in connection with any act or omission by a Participant in performing the Alliance Works.

No Constraint or Fetter

18.8 We acknowledge and accept that nothing in, implied by, or any document contemplated by, this Agreement has the effect of placing any fetter, constraint or limitation on the exercise by the Owner of any of its statutory rights, duties, powers or functions.

Other Agreements

18.9 We agree not to enter into any agreement, arrangement or understanding which may affect the rights, obligations or liabilities of any Participant in connection with this Agreement, without the prior approval of the ALT.

19. PARENT COMPANY GUARANTEE

Parent Company Guarantee

19.1 Each NOP will on or before the Commencement Date procure its ultimate holding company to execute the Parent Company Guarantee in the form of Schedule 14.

19.2 If during the Term, the Guarantor who executes the Parent Company Guarantee (**First Parent Company Guarantee**) ceases to be the ultimate holding company or an Affiliate of the NOP, the NOP will procure a substitute Parent Company Guarantee (**Substitute Parent Company Guarantee**) in the form of the Parent Company Guarantee in Schedule 14 (or equivalent security as determined by the Owner) by a party determined as acceptable by the Owner. Upon the Owner's receipt of the Substitute Parent Company Guarantee:

19.2.1 the Owner will release and discharge the substituted guarantor from any and all liabilities in respect of the First Parent Company Guarantee; and

19.2.2 the Owner will simultaneously return the First Parent Company Guarantee to the substituted guarantor.

19.3 Any agreement between the Guarantor and the Owner with respect to any amounts to be paid to the Owner under a Parent Company Guarantee is without prejudice to the Owner's right to make continuing claims against the NOPs or any guarantor under a Parent Company Guarantee in relation to any matters covered by the Parent Company Guarantee.

Return of security

19.4 Any Parent Company Guarantee provided in accordance with this Section 19, will be returned by the Owner as soon as practicable after Final Completion.

Financial Statements

19.5 Each year until the expiry of the Term each NOP will provide, and will procure that their Guarantor will provide, to the Owner:

19.5.1 audited or unaudited half yearly financial statements;

19.5.2 audited annual statements or if audited annual financial statements are not prepared by the NOP or the Guarantor (as the case may be), unaudited annual financial statements and such additional information requested by the Owner (acting reasonably); and

19.5.3 to the extent that a NOP and/or its Guarantor has a credit rating, confirmation of the current credit rating provided by a recognised rating agency acceptable to the Owner (acting reasonably),

of the NOPs and the Guarantor (as the case may be) within 20 Business Days of the latter of the date they are signed off by the relevant auditor, accepted by the board of the NOPs or the Guarantor (as the case may be) or lodged with the relevant Authority or securities exchange, as the case may be. The NOPs acknowledge and accept that if a NOP and/or its Guarantor do not have audited annual statements they will provide such additional information or documentation reasonably requested by the Owner or the Financial Auditor.

Irrevocable Letter of Credit

19.6 If at any time prior to the Final Completion Date in relation to a Guarantor of one of the NOPs (for the purpose of Sections 19.6 and 19.7, the "**relevant NOP**"):

19.6.1 the Financial Auditor, on the request of the Owner or the ALT, determines from any information provided in accordance with Section 19.5 that there has been a material deterioration, or there is a credible threat of a material deterioration, in the financial strength, capacity or performance of a Guarantor of the relevant NOP; or

19.6.2 an Act of Insolvency occurs with respect to the Guarantor of the relevant NOP,

the Owner may direct the relevant NOP to provide within 10 Business Days of a direction by the Owner under this Section 19.6:

(a) issued prior to the Substantial Completion Date, an irrevocable letter of credit in an amount equal to 50% of the Limb 2 Fee identified in the TOC at the Commencement Date as payable to the relevant NOP for the performance of the Alliance Works in accordance with the Agreement; or

(b) issued after the Substantial Completion Date but prior to the Final Completion Date, an irrevocable letter of credit in an amount equal to 25% of the Limb 2 Fee identified in the TOC at the Commencement Date as payable to the relevant NOP for the performance of the Alliance Works in accordance with the Agreement,

to secure the relevant NOP's performance under the Agreement, including any liability to pay Limb 3 painshare, where the irrevocable letter of credit will be in the form set out in Schedule 16 from a bank listed under Schedule I of the *Bank Act* (Canada) that has the Required Rating.

19.7 The Owner will:

19.7.1 withhold any further payment of Limb 2 until the Owner receives an irrevocable letter of credit on the basis set out in Section 19.6.2(a) or Section 19.6.2(b);

19.7.2 for any irrevocable letter of credit provided by the relevant NOP in accordance with Section 19.6.2(a):

(a) release 50% of the value of the irrevocable letter of credit within 40 Business days after the interim determination of Limb 3 painshare or gainshare determined in accordance with Schedule 5; and

(b) release the remaining value of the irrevocable letter of credit within 60 Business Days after the Final Completion Date; and

19.7.3 for any irrevocable letter of credit provided by the relevant NOP in accordance with Section 19.6.2(b) release the irrevocable letter of credit within 60 Business Days after the Final Completion Date.

Convert Irrevocable Letter of Credit

19.8 Each NOP acknowledges and agrees that if the NOP fails to pay the Owner monies due under this Agreement, including monies due under any indemnity under this Agreement, within 20 Business Days (or such longer period agreed in writing by the Owner) of such monies becoming due under this Agreement, the Owner may immediately make a demand under any irrevocable letter of credit provided by the NOP in accordance with Section 19.6.2(a).

20. GENERAL

Assignment and Novation

20.1 The NOPs will not assign, transfer or novate to any third party any of their obligations or entitlements under this Agreement without the prior written approval of the Owner, which consent may be given or withheld by the Owner in its discretion.

20.2 An approval given by the Owner permitting the NOPs to assign, transfer or novate any of their obligations or entitlements under this Agreement does not relieve the NOPs from their obligations and liabilities pursuant to this Agreement, and the NOPs will be responsible for acts and omissions of any assignee or novatee.

20.3 The Owner may assign, transfer or novate its rights or obligations to any person or entity that the Owner can demonstrate has the resources to perform the Owner's obligations or entitlements under this Agreement.

Costs

20.4 Each party will pay its own legal and other costs and expenses of negotiating this Agreement and in preparing, drafting, executing and performing its obligations under this Agreement, any amendments to this Agreement or any agreement replacing this Agreement.

Entire agreement

20.5 The Agreement contains everything we have agreed to in relation to our Alliance. None of us will rely on any earlier document prepared, or statement made, by one of us before this Agreement was executed.

Governing law

20.6 The Agreement will be governed by and construed in accordance with the Laws of the Province of British Columbia and the Laws of Canada applicable therein, and the parties irrevocably and unconditionally submit to the exclusive jurisdiction of the courts of British Columbia and any courts entitled to hear appeals from the courts of British Columbia.

Severability

20.7 Any provision of this Agreement which is or becomes illegal, void or unenforceable will be ineffective to the extent only of such illegality, voidness or unenforceability and will not invalidate the remaining provisions and will be read in such a way as to make it consistent with, and ensure the integrity of, our commitments in Section 2, our Alliance Principles and Project Alliance Objectives.

Further Assurances

20.8 We will do, execute and deliver, or will cause to be done, executed and delivered, all such further acts, documents (including certificates, declarations, affidavits, reports and opinions) and things as may be necessary for the purpose of giving effect to this Agreement.

Variation

20.9 The parties agree that with the exception of the Exhibits attached to Schedules, which can be amended, replaced or added by agreement in writing of the parties' respective ALT representatives, this Agreement may not be changed or modified in any way after it has been signed except in writing signed by or on behalf of the parties.

Counterparts

20.10 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. A party may deliver an executed copy of this Agreement by facsimile or other electronic means.

Taxes

20.11 Except as provided by Section 20.12 and the Compensation Framework all taxes, duties, excises, levies, assessments and other charges of any kind levied by any government or government body arising out of or in connection with the Alliance Works will be Limb 1 Reimbursable Costs. If Section 182 of the *Excise Tax Act* is applicable to any amount payable by the Owner to a NOP as compensation on termination or settlement under this Agreement, such amounts will be increased such that after remitting the applicable GST, the NOP will be in the same position it would have been in as if Section 182 of the *Excise Tax Act* did not apply.

20.12 Notwithstanding Section 20.11 we agree that:

20.12.1 any corporate or personal income tax or capital gains tax imposed on a Participant;

20.12.2 GST; and

20.12.3 any penalties and/or fines on any of the matters referred to in Section 20.11,

are not Limb 1 Reimbursable Costs.

Currency

20.13 All amounts payable under this Agreement will be paid in Canadian Dollars.

Waiver

20.14 Any waiver or relaxation of any part of this Agreement will be determined by the unanimous written agreement of the ALT expressly acknowledged as a waiver or relaxation of that part of this Agreement. Any waiver or relaxation will only apply to a particular occasion unless determined by the ALT to be continuing. It will not constitute a waiver or relaxation of any other term of this Agreement.

Authority

20.15 We each represent and warrant to each other that we have full power to enter into and perform our obligations under this Agreement so as to constitute a legally valid and binding obligation upon us in accordance with its terms.

Indemnities

20.16 Each indemnity given by us under this Agreement is a continuing obligation separate and independent from our other obligations under this Agreement and notwithstanding anything else in this Agreement is intended to be enforceable and to survive the termination, completion or expiry of this Agreement. An

indemnified party will take all reasonable steps to mitigate any amounts payable pursuant to the indemnity. Despite any other provision in this Agreement, a party's liability under an indemnity will be reduced proportionally to the extent that the indemnified party has caused or contributed to the relevant cost, loss, expense, damage or liability.

No Representation or Reliance

20.17 Each of us acknowledges and agrees that:

20.17.1 none of us have made any representations or other inducements, other than those incorporated into this Agreement, to induce us to enter into this Agreement;

20.17.2 we did not enter into this Agreement in reliance upon any representation or other inducement, other than those incorporated into this Agreement; and

20.17.3 we will not bring any claim against another Participant for any misrepresentation or misleading conduct unless the misrepresentation or misleading conduct amounts to an act of Wilful Default.

Successors and Assigns

20.18 This Agreement enures to the benefit of and binds the Owner, its successors and its assigns and all other Participants and their successors and permitted assigns.

Joint and several liability

20.19 Where a Participant comprises two or more persons, each of them are jointly and severally liable for all of that party's liabilities and obligations under or arising out of or in connection with this Agreement.

Financial Difficulties

20.20 Each Participant will immediately notify each Participant in writing if it becomes reasonably likely that the Participant may not be able to satisfy any of its financial obligations in relation to this Agreement from the financial resources available, or likely to be available to it, at the time the financial obligation is due.

Early Works and Alliance Mobilization Works

20.21 The Participants acknowledge and agree that prior to the Commencement Date:

20.21.1 the Owner may perform, or may procure a third party to perform, Early Works, and such Early Works will not form part of the Alliance Works; or

20.21.2 the Owner may procure the Participants to perform Alliance Mobilization Works under the Alliance Development Agreement or any other agreement or arrangement with the Owner and such Alliance Mobilization Works will be deemed to be Alliance Works “as if” the Alliance Mobilization Works were performed under the Agreement by the Participants.

20.22 The Participants acknowledge and agree that for the purposes of the Agreement and the Compensation Framework:

20.22.1 the costs incurred by the Owner performing, or procuring the performance of, Early Works prior to the Commencement Date will not be considered Owner Alliance Costs and will not form part of the TOC or the calculation of AOC; and

20.22.2 the costs incurred by the Participants performing Alliance Mobilization Works prior to the Commencement Date will be considered Owner Alliance Costs or Limb 1 Reimbursable Costs, as the case may be, and will form part of the TOC and the calculation of AOC.

21. CONFIDENTIALITY AND PERSONAL INFORMATION

Confidentiality

21.1 We will not, and we will ensure that those for whom we are responsible, will not:

21.1.1 disclose to any person any Confidential Information; or

21.1.2 publish any documentation or Confidential Information,

without the prior written consent of the Participant that designated the information as Confidential Information and/or the Owner (as the case may be). We will ensure that any recipient to whom Confidential Information is disclosed will be subject to confidentiality obligations acceptable to the Participant that designated the information as Confidential Information and/or the Owner (as the case may be).

21.2 We will, if requested by the Owner, execute a confidentiality agreement in relation to any Confidential Information obtained by us for the purposes of this Agreement or the Project.

21.3 The obligations in Section 21.1 will not extend to:

21.3.1 any disclosure that has prior written consent from the Owner;

21.3.2 any disclosure required by FIPPA;

21.3.3 Confidential Information already in the public domain other than due to a breach of this Agreement;

21.3.4 any disclosure to our auditors, legal advisers or third parties necessary for the performance of our obligations under this Agreement;

21.3.5 any disclosure that is required to a stock exchange licenced to trade securities;

21.3.6 any disclosure of information reasonably required in order to comply with a request for information made by the Auditor-General for British Columbia or any use of such information or publication, disclosure or release of any report, finding, conclusion or recommendation by the Auditor-General of British Columbia arising from any such information or disclosure;

21.3.7 any disclosure to an employee, agent or Subcontractor of a Participant when the disclosure is reasonably necessary for the conduct of the Alliance Works;

21.3.8 information reasonably required in order to publish appropriate and comprehensive performance data relating to the Alliance Works; and

21.3.9 Confidential Information required by, or provided to, any provincial ministry, Infrastructure BC and any other government department, statutory authority or senior officer of a government department or a statutory authority or any use, release, announcement, publication or disclosure of such information by any of them in any forum in any media or medium.

21.4 If we are or become required by law to disclose any documentation or Confidential Information we will:

21.4.1 immediately inform the ALT;

21.4.2 take all reasonable steps to lawfully resist or narrow the requirement of disclosure; and

21.4.3 assist and co-operate with the Owner if it seeks to limit or resist the requirement for the disclosure.

Privacy

21.5 Each Participant will only collect, hold, process, use, store and disclose Personal Information:

21.5.1 with the prior consent of the Owner; or

21.5.2 to the extent necessary to perform its obligations under this Agreement and in circumstances where the Owner itself could collect, hold, process, use, store and disclose Personal Information if the Owner itself performed such obligations, and

in accordance with applicable Laws, including FIPPA, as if the provisions of such Laws applied directly to the Participants.

21.6 The NOPs acknowledge that they are each a “service provider” as defined in FIPPA.

21.7 The NOPs will allow the Owner on reasonable notice to inspect the measures of the NOPs and the Subcontractors to protect Personal Information.

21.8 The Owner may from time to time provide guidance to the NOPs on the requirements of Sections 21.5 to 21.7. For greater certainty, the provisions of Sections 21.5 to 21.7 that refer to FIPPA will apply to the NOPs and the Subcontractors only to the extent necessary to fulfil the Owner’s obligations under FIPPA.

Publicity or media statements

21.9 We:

21.9.1 accept that the Owner is responsible for all media for the Project;

21.9.2 accept that we are responsible for the development and implementation of a media and communications plan for the Project that satisfies the Owner's requirements;

21.9.3 acknowledge and accept that we will not issue any information, publication, document or article relating to our Alliance or the Project without the prior written approval of the Owner's community relations manager and the Owner;

21.9.4 will immediately refer to the Owner any media enquiries relating to the Alliance or the Project;

21.9.5 agree to comply with any reasonable request by the Owner regarding the media communications or media liaison for the Alliance or the Project, including ensuring that all communications comply with the Owner's brand and logo guidelines;

21.9.6 will comply with the media and communications strategy, including the disclosure of any information, publication, document or article relating to the Alliance, the performance of the Alliance Works or the Project and refer any media enquiries relating to the Alliance or the Project to the Owner; and

21.9.7 wherever practicable ensure that all communications material is printed on recycled paper.

21.10 We will develop a communication and engagement plan in accordance with the provisions set out in Schedule 7 which is consistent with the provisions of Section 21.9.

Compliance

21.11 We will, during the performance of the Alliance Works and for the period set out in Section S1.6 of Schedule 1 from the Final Completion Date, comply with the requirements of this Section 21.

22. NOTICES

Giving a communication

22.1 A notice, demand, certification, process or other communication (**Notice**) relating to this Agreement will be in writing in English and is properly given or served by a party if that party:

22.1.1 delivers it by hand;

22.1.2 transmits it by electronic mail; or

22.1.3 transmits it by other electronic means,

to the address of the relevant party specified in Section S1.6 of Schedule 1, marked to the attention of the relevant person specified in Section S1.6 of Schedule 1.

Change of Address

22.2 Each party will advise the other of any change in the address or identity of the relevant person to whom Notices are to be addressed.

Deemed Receipt

22.3 A Notice is deemed to be received if:

22.3.1 delivered by hand, when the party who sent the notice holds a receipt for the Notice signed by a person employed at the physical address for service;

22.3.2 sent by electronic mail, only in the event that the other party acknowledges receipt by any means; or

22.3.3 sent by any other electronic means, only in the event that the other party acknowledges receipt by any means.

23. TERM AND SURVIVAL

Term

23.1 We agree that this Agreement will commence on the Commencement Date and will continue until the later of the date that:

23.1.1 this Agreement is terminated by the Owner;

23.1.2 each and every obligation under this Agreement is complete, satisfied or discharged; and

23.1.3 the Owner issues the Certificate of Final Completion.

Survival

23.2 This Agreement does not affect any rights or liabilities which have accrued to either party before or at termination or expiry, nor any liabilities which may arise from damages deriving from a breach of this Agreement before or at termination.

23.3 The obligations in Sections 3, 7, 8, 9.2, 9.3, 9.9, 11.1, 11.12 to 11.14, 12, 13, 14, 15, 17, 18, 19, 20.1 to 20.20, 21, 22, 23 and 24, and Schedule 1, Schedule 5, Schedule 11 and Schedule 17, or parts of schedules necessary to give effect to the Participant's intention with respect to this Section 23, are continuing obligations and those Sections survive rescission, termination, completion or expiration of this Agreement.

24. CHANGE IN CONTROL

24.1 Subject to Section 24.2, the NOPs will:

24.1.1 provide the Owner with reasonable prior notice of any proposed Change in Control of a NOP or its Guarantor; and

24.1.2 obtain the Owner's prior written agreement to any Change in Control in respect of a NOP or its Guarantor.

24.2 Where the Change in Control has occurred as a result of a Change in Control of a corporation listed on a stock exchange, and the NOP or Guarantor the subject of the Change in Control is unable to, or it is not practicable to, comply with Section 24.1, the NOP or Guarantor the subject of the Change in Control will:

24.2.1 provide the Owner with notice of the Change of Control as soon as possible following the Change in Control; and

24.2.2 obtain the Owner's written agreement to any Change in Control which has occurred in respect of it,

and the relevant Change in Control will not be a Wilful Default.

24.3 The NOP or Guarantor the subject of the Change in Control will provide the Owner with reasonable documentation or information requested by the Owner and attend any meetings (including, where reasonably requested by the Owner with any third party acquiring or exercising control over the NOP or Guarantor) arising out of or in connection with the proposed Change in Control.

24.4 The NOP or Guarantor the subject of the Change in Control will use its best efforts to procure any third party involved in the Change in Control to execute any documentation requested by the Owner (which may include an appropriate parent company undertaking or guarantee) to enable the Owner to determine whether the proposed Change in Control will have any prejudicial effect on the Owner's interests or the Alliance Works.

24.5 The NOP the subject of the Change in Control will use its best efforts to make all necessary administrative arrangements so as to minimize any adverse impact of a Change in Control on the Owner's interests or the Alliance Works.

24.6 In the event of any Change in Control of a NOP or Guarantor, the NOP the subject of the Change of Control agrees, and will procure its Guarantor the subject of a Change in Control to agree, that it will use its best efforts to make all necessary administrative arrangements so as to minimize any adverse impact on the Project.

24.7 Any costs incurred by the NOPs arising out of or in connection with a Change in Control and performing their obligations under Section 24 will not be reimbursed by the Owner as a Limb 1 cost.

24.8 The Owner acknowledges and agrees that:

24.8.1 Parkin Architects Western Ltd. (**Parkin**) is a wholly owned subsidiary of Parkin Architects Limited (**PAL**), which is a wholly employee owned architectural practice;

24.8.2 as a wholly employee owned architectural practice, it is common for there to be adjustments to the distribution of the shares, units or equity in PAL to reflect changing circumstances of the practice (e.g. operation of employee share schemes, employment of new employees, promotion of existing employees or the resignation or retirement of exiting employees (for the purposes of this Section 24.8 **Equity Redistribution**);

24.8.3 it is not the intention of the Owner that an Equity Redistribution would trigger the operation of this Section 24; and

24.8.4 provided that:

(a) Parkin remains a wholly owned subsidiary of PAL; and

(b) an Equity Redistribution does not result in a scenario of the type contemplated by sub-paragraphs (b)(iii) to (b)(vi) inclusive of the definition of “Change in Control”,

an Equity Redistribution is not a Change in Control of Parkin for the purposes of Section 24.

SCHEDULE 1
DEFINITIONS AND INTERPRETATION

Definitions

S1.1 In this Agreement the following definitions apply:

Act of Insolvency means any of the following events:

(a) a receiver, receiver manager or other encumbrance holder taking possession of or being appointed over, or any distress, execution or other process being levied or enforced upon, the whole or any material part of the assets of a NOP or its Guarantor;

(b) any proceedings with respect to a NOP or its Guarantor being commenced under the *Companies' Creditors Arrangement Act* (Canada) and if such proceedings are commenced against a NOP or its Guarantor and are disputed by that NOP or its Guarantor, such proceedings are not discontinued, withdrawn, dismissed or otherwise remedied within 30 Business Days;

(c) a NOP or its Guarantor making an assignment for the benefit of its creditors, being declared bankrupt or committing an act of bankruptcy, becoming insolvent, making a proposal or otherwise taking advantage of provisions for relief under the *Bankruptcy and Insolvency Act* (Canada) or similar legislation in any jurisdiction, or any other type of insolvency proceedings being commenced by or against a NOP or its Guarantor under the *Bankruptcy and Insolvency Act* (Canada) or similar legislation in any jurisdiction and, if proceedings are commenced against a NOP or its Guarantor and are disputed by that NOP or Guarantor, such proceedings are not stayed, dismissed or otherwise remedied within 30 Business Days; or

(d) a NOP or its Guarantor ceases to carry on business,

or any conduct, act, event or circumstance that has substantially the same effect as any of the conduct, acts, events or circumstances identified above.

Actual Outturn Costs (**AOC**) has the meaning in Schedule 5.

AD Phase has the meaning given to that term in the ADA.

Adjustment Event means an event or circumstance that may justify an adjustment to the Compensation Framework targets governing Limb 3 Gainshare/Painshare, being either:

(a) an event or circumstances expressly stated in this Agreement to be an Adjustment Event;

(b) an event or circumstance stated in Schedule 5 to be an Adjustment Event; or

(c) an event or circumstance determined by the ALT to be an Adjustment Event by reference to the Adjustment Event Guidelines in accordance with Section 12.

Adjustment Event Guidelines means the guidelines with that name set out in Schedule 17.

Affiliate in respect of a Person means any other Person that, directly or indirectly, through one or more intermediaries, controls, is controlled by, or is under common control with, such first Person where

"control" means, with respect to the relationship between or among two or more Persons, the possession, directly or indirectly or as trustee, personal representative or executor, of the power to direct or cause the direction of the affairs or management of a Person, whether through the ownership of voting securities, as trustee, personal representative or executor, by statute, contract, credit arrangement or otherwise, including the ownership, directly or indirectly, of securities having the power to elect a majority of the board of directors or similar body governing the affairs of such Person.

Agreement means this agreement between the Participants.

Alliance means this alliance which we have established to perform the Alliance Works.

Alliance Development Agreement or **ADA** means the agreement entered into between the Owner and the NOPs dated 20 July 2021 under which the NOPs developed and submitted the Project Proposal.

Alliance Governance Framework has the meaning given to that term in Section 6.1.

Alliance Leadership Team (**ALT**) means the leadership team established under Section 5.1.

Alliance Management Plans are the management plans prepared by the AMT to comply with the Alliance Management Plan Requirements as approved by the ALT in accordance with Section 6.3.

Alliance Management Plan Requirements are set out in Schedule 7.

Alliance Management System or **AMS** has the meaning in Schedule 7.

Alliance Management Team (**AMT**) means the management team established under Section 5.10.

Alliance Mobilization Works has the meaning given to that term in the ADA.

Alliance Project Manager (**APM**) means the leader of the AMT appointed by the ALT.

Alliance Principles are set out in Section 1.2.

Alliance Team Charter has the meaning given in Schedule 9.

Alliance Works means the:

(a) works, services and undertakings required to perform our obligation under this Agreement; and

(b) permanent works to be delivered to the Owner on Substantial Completion in accordance with this Agreement,

as the case may be, and the circumstances under this Agreement require.

ALT Accountabilities and Responsibilities Matrix means the ALT accountabilities and responsibilities matrix set out in Schedule 9.

APM Accountabilities and Responsibilities Matrix means the APM accountabilities and responsibilities matrix set out in Schedule 10.

Authority means any statutory or government body or organisation or any non-government body or organisation (and their respective departments, agencies, authorities or officers or representatives) in Canada that have authority or jurisdiction over:

(a) all or part of the Alliance Works;

(b) a Participant;

(c) the Site; or

(d) any land external to the Site on which Alliance Works may be carried out.

BCIB means BC Infrastructure Benefits Inc., a company incorporated under the laws of British Columbia having its head office at Suite 1050 – 89 West Georgia Street, Vancouver, BC V6B 0N8.

BCIB-Contractor Agreement means an agreement entered into between BCIB and a NOP for the purposes of implementing and administering the Community Benefit Agreement.

BCIB-Subcontractor Agreement means an agreement entered into between BCIB and a Subcontractor or any tier for the purposes of implementing and administering the Community Benefit Agreement.

Best for Project means an outcome, decision, solution or result that is consistent with our Alliance Principles, achieves the Project Alliance Objectives, enables or facilitates the efficient performance of the Alliance Works and which is arrived at or taken for the ultimate purpose of providing Fit for Purpose assets to the Owner.

BLA means the *Builders Lien Act* (British Columbia).

Business Day means a day means a day that is not a Saturday, Sunday, or statutory holiday in British Columbia.

CCDC 9A means the Canadian Construction Documents Committee's form of statutory declaration titled '*CCDC 9A – 2018 Statutory Declaration of Progress Payment Distribution by Contractor*'.

Certificate of Final Completion means the certificate issued in accordance with Section 11.12.

Certificate of Substantial Commissioning means the certificate issued in accordance with Section 11.7A.

Certificate of Substantial Completion means the certificate issued in accordance with Section 11.7.

Change in Control means with respect to a relevant Person:

(a) any direct or indirect change by contract or otherwise (other than as set out in (b)) which results in a Person or group of Persons having the ability to direct or cause the direction of the management, actions or policies of the relevant Person; or

(b) any:

(i) direct or indirect change in the ownership or control of any legal, beneficial or equitable interest in any or all of the shares, units or equity in the relevant Person (including the

control over the exercise of voting rights conferred on equity share capital, unit interests or equity interests or the control over the right to appoint or remove directors, a general partner or other managers), including changes arising from assignment or transfer of existing shares, units or equity, issuance of new shares, units or equity or amalgamation, merger consolidation, amendment of a limited partnership certificate or other reorganization; or

(ii) other direct or indirect change,

which results in a Person or group of Persons, other than the equity holders of the relevant Person immediately prior to the change, directly or indirectly:

(iii) controlling the composition of the majority of the board of directors of the relevant Person or of a general partner or manager of the relevant Person;

(iv) controlling the decisions made by or on behalf of the relevant Person, including by controlling the voting power of the board of directors or by controlling the voting power of any class of shareholders or equity holders of any of the relevant Person, a general partner of the relevant Person or a manager of the relevant Person or otherwise;

(v) holding equity (either beneficially or otherwise) of the relevant Person with a subscribed value (taking into account contributions to be made in the case of a limited partnership) of more than one half of the subscribed value (taking into account contributions to be made in the case of a limited partnership) or equity (either beneficially or otherwise) of the relevant Person with more than one half of the voting rights; or

(vi) having the ability to direct or cause the direction of the management, actions or policies of the relevant Person.

Commencement Date means the date this Agreement is executed by the Owner.

Community Benefit Agreement or CBA is the agreement dated 17 July 2018 (as may be amended, supplemented or restated from time to time) entered into between BCIB and the Allied Infrastructure and Related Construction Council of British Columbia which governs the terms and conditions of employment for certain people in respect of the Alliance Works and the Project.

Compensation Framework is set out in Schedule 5.

Competitive Alliance Selection Process has the meaning in the ADA.

Confidential Information means any information of a Participant, BCIB or IBC (the **disclosing** party) that the disclosing party has designated as confidential at the time of disclosure and which is supplied, or to which access is granted, to or on behalf of one or more of the other Participants, BCIB or IBC (the **receiving party**) (whether before or after the date of this Agreement), either in writing, or in any other form, directly or indirectly pursuant to discussions with the receiving party and includes all analyses, compilations, studies and other documents whether prepared by or on behalf of a disclosing party which contain or otherwise reflect or are derived from such designated information.

Construction Plant means plant, equipment and appliances used in the performance of the Alliance Works which do not form part of the permanent Alliance Works.

Default for the purposes of Section 17 means either a Wilful Default or an Act of Insolvency.

Default Notice for the purposes of Section 17 means a notice issued under Section 17.1 or Section 17.5, as the case may be.

Defaulting NOP means a NOP:

(a) who has committed a Wilful Default; or

(b) in respect of which an Act of Insolvency has occurred; or

(c) in respect of whose Guarantor, an Act of Insolvency has occurred.

Defect means any defective, non-complying, incomplete or omitted works or services in the Alliance Works other than any defective, non-complying or incomplete or omitted works or services:

(a) caused by fair wear and tear; or

(b) arising out of or in connection with a failure to perform operations and maintenance activities in accordance with operations and maintenance manuals approved by the ALT prior to Substantial Completion as satisfying the requirements of this Agreement.

Defect Correction Period means in respect of the Alliance Works:

(a) a 24 month period for the rectification of Defects under Section 11.8 commencing on the Substantial Completion Date; and

(b) where the Owner determines that there will be a separate Defect Correction Period for a Defect, the Defect Correction Period for that Defect will be the later of the expiry of the period described in sub-paragraph (a) of this definition and the separate Defect Correction Period calculated in accordance with Section 11.9.2.

Design Elements has the meaning in the Specification.

Design Management Plan means the design management plan referred to in Schedule 7.

Dispute means any real or perceived conflict, difference of opinion, dispute or unresolved issue in connection with the Alliance Works or this Agreement.

Early Works mean any work carried out by or on behalf of the Owner prior to the Commencement Date that is not intended to form part of the Alliance Works.

Employee Supply Agreement is the agreement related to the supply of employees to the Project, as may be amended, supplemented or restated from time to time, to be entered into by the Owner and BCIB.

Engaged Person means any individual engaged by any one of the Participants to perform any works, services or activities forming part of the Alliance Works.

Enhancement has the meaning given to that term in Schedule 11.

Establishment Audits has the meaning given in Section S5.3(a).

Existing Intellectual Property Rights or **Existing IPR** means all Intellectual Property Rights owned or held by any of the Participants as at the Commencement Date or created by a Participant independently of the performance of the Alliance Works.

Financial Auditor (FA) means a financial auditor appointed by the Owner for the purposes of this Agreement.

Final Completion means that stage in the performance of Alliance Works when Substantial Completion and Substantial Commissioning has occurred, all Defect Correction Periods have expired, all Defects are rectified and each and every obligation under this Agreement is complete, satisfied or discharged (other than an obligation to pay, or an entitlement to receive payment of, Limb 3) in accordance with Schedule 5.

Final Completion Date means the date certified in the Certificate of Final Completion that the Alliance Works achieved Final Completion.

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

Fit for Purpose an asset is fit for purpose when it achieves:

(a) the benefits or purpose required by this Agreement (including performance and functional requirements of the Specification) or those purposes necessarily inferred from this Agreement; and

(b) the purpose which, having regard to the performance and functional requirements of the Specification could be reasonably inferred by a person experienced and competent in the performance of works and services required for projects similar to the Project.

First Parent Company Guarantee has the meaning given in Section 19.2.

GAAP means generally accepted accounting principles in effect in Canada including the accounting recommendations published in the Handbook of the Canadian Institute of Chartered Accountants.

Good Faith means:

(a) acting fairly, reasonably, honestly and with integrity at all times;

(b) doing all proper and reasonable things to enable each other to perform the Alliance Works; and

(c) doing all proper and reasonable things to give effect to the spirit and intent of this Agreement.

Good Industry Practice means practices, procedures, means, methods and techniques followed when works and services are performed:

(a) in a sound and workmanlike manner;

(b) with due skill, care and diligence;

(c) with due expedition and without unnecessary or unreasonable delay;

(d) in a manner which allows for this Agreement to be efficiently performed;

(e) using materials of new merchantable quality which are Fit for Purpose;

(f) to the standard expected of a person experienced and competent in the performance of works similar to the Alliance Works;

(g) in accordance with all applicable Laws; and

(h) consistently with accepted industry practice for the design, procurement, supply, construction, testing and commissioning of works similar to the Alliance Works.

GST means the goods and services tax imposed pursuant to section IX of the *Excise Tax Act* (Canada).

Guarantor means the party that executes a Parent Company Guarantee in accordance with Section 19.1 or 19.2 as the case may be.

Infrastructure BC (IBC) means Infrastructure BC Inc., being a provincial crown corporation providing planning and procurement expertise for major infrastructure projects in the public sector in British Columbia.

Initial TOC has the meaning given in Section S5.4.

Insurance Conditions are set out in Schedule 13.

Intellectual Property Rights (**IPR**) means all intellectual property rights and interests (including common law rights and interests), including but not limited to all:

(a) patents, trademarks, copyrights, registered and unregistered designs, trade names, domain names, symbols and logos;

(b) patent applications and applications to register trademarks, and designs;

(c) methods, plans, data, drawings, specifications, characteristics, inventions, improvements, know how, experience, trade secrets, confidential information or other information; and

(d) licences or similar user rights in respect of any such rights and interests,

in Canada and the world, whether registered or unregistered for the duration of the rights and interests.

Key Individual means any person nominated in Schedule 8 or any person replacing such Key Individual in accordance with this Agreement.

Key Performance Indicator (KPI) means the measures used to assess performance against the KRAs, as outlined in the KRA Performance Management Plan.

Key Result Areas (**KRAs**) and the **KRA Objectives** against which our performance will be measured are set out below, as more fully particularised in the KRA Plans attached in Schedule 18:

No	Key Result Area (KRA)	KRA Objective
1	**Substantial Completion and Substantial**	**Substantial Completion**

	Commissioning Delivering the Project within a defined window to support activation of the operations	• Achieve Substantial Completion by the Target Substantial Completion Date. **<u>Sunstantial Commissioning</u>** • Achieve Substantial Commissioning by the date 8 weeks after the Substantial Completion Date.
2	**Key User Satisfaction** Achievement of key clinical outcomes through effective and meaningful engagement with key users	• Clinical and patient stakeholders feel that they were adequately engaged through design and construction. • First Nation, Metis, and Indigenous people feel that they were adequately engaged through the design and construction of indigenous related objectives.
3	**Design Elements Outcomes** Enhance patient, operational and infrastructure outcomes through optimal Design Elements in the following categories: • Operational innovations; • Indigenous representations and inclusions; • Healing environment; and • Cowichan District Hospital Future Vision.	• Achievement of Design Elements Outcomes.
4	**Facility Maintenance and Environmental Sustainability Outcomes** Design and construction teams have a consideration for: • Maintenance and lifecycle cost for asset management, and organizational and operational costs, • minimize Green House Gas emissions; and • maximize Energy efficiency	• Maintenance and Lifecycle Cost; • Environmental Sustainability – Operational Energy Use Intensity; • Environmental Sustainability – Operational Greenhouse Gas Emissions; and • Environmental Sustainability – Embodied Greenhouse Gas Emissions.
5	**Community Benefits** Develop, grow and mobilize a local, diverse workforce to benefit the community	• Facilitate and optimize the supply of a diverse, skilled and safe workforce. • Creation of career development opportunities to grow a diverse and local trade and professional workforce.

		• Growing job opportunities for apprentices and trainees.
6	**Health of Alliance** Developing and sustaining a high-performing collaborative alliance culture	• Fulfillment of a High-Performing Collaborative Alliance. • Fulfillment of a positive safety culture • Fulfillment of a Culturally Safe and Respectful Work Environment

KRA Plans the documents attached at Schedule 18 as may be updated from time to time by the ALT and endorsed by the Owner.

Law means all laws (including the common law), statutes, regulations, treaties, judgments and decrees and all official directives, by-laws, rules, consents, approvals, authorizations, guidelines, orders and policies of any Authority having the force of law from time to time.

Lien Holdback means the holdback required under the BLA.

Limb 1 Reimbursable Costs (also referred to as **Limb 1** and/or **Reimbursable Costs**) has the meaning given in Schedule 5.

Limb 2 has the meaning given in Schedule 5.

Limb 3 has the meaning given in Schedule 5.

Loss includes any loss, cost, expense, damage or liability (including any fine or penalty) whether direct, indirect or consequential (including revenue loss and pure economic loss), present or future, fixed or unascertained, actual or contingent and whether arising under contract (including any breach of this Agreement), in equity (including breach of an equitable duty, breach of confidentiality or breach of fiduciary duty), under statute (including breach of statutory duty, to the maximum extent possible), in tort (including for negligence or negligent misrepresentation) or otherwise (including in restitution).

Materials has the meaning given in Section 8.10.

Minimum Conditions of Satisfaction (**MCOS**) means the minimum acceptable level of performance nominated in this Agreement for each KPI or KRA as the case may be.

New Intellectual Property Rights or **New IPR** means all Intellectual Property Rights created by a Participant for the purposes of performing the Alliance Works.

No Dispute means our commitments to, and agreement with, each other set out in Section 3 to resolve all disputes, disagreements or differences of opinion unanimously at and within the ALT in accordance with this Agreement.

Non-Defaulting NOP or Non-Defaulting NOPs means the NOPs other than the Defaulting NOP.

Non-Defaulting Participants means the Owner and the Non-Defaulting NOPs.

Non-Owner Participant and Non-Owner Participants (NOP or NOPs) means:

(a) EllisDon Corporation, also referred to as "EllisDon", and as NOP1 for the purposes of Schedule 5; and

(b) Parkin Architects Western Ltd., also referred to as "Parkin", and as NOP2 for the purposes of Schedule 5.

officer/Officer means an "officer" as such term is used in the *Business Corporations Act* (British Columbia);

OHS Legislation means the *Workers Compensation Act* (British Columbia), the *Occupational Health and Safety Regulation* and all other regulations made under that Act, as may be amended from time to time.

Open Book is a reference to the Participants' commitments to share on a transparent and full and continuing disclosure basis all information and documentation of the financial costs of performing the Alliance Works to ensure the highest standards of fairness and integrity are achieved so that only the true and bona fide costs of performing the Alliance Works are sought to be, and are in fact, reimbursed under this Agreement as Limb 1 Reimbursable Costs.

Other Site means any lands or areas other than the Site made available by the Owner to the Participants for the purposes of performing the Alliance Works and any land which the Participants enter in or on, or occupy, for the purposes of the Alliance Works.

Owner Alliance Costs or (**OAC**) has the meaning given in Schedule 5.

Owner Reserved Power has the meaning given in Section 4.5.

Owner's Representative means the person identified in Section S1.6 of Schedule 1 or any other person nominated by the Owner to the Participants as the Owner's Representative in accordance with Section 4.7.

Parent Company Guarantee means a guarantee to be executed in accordance with Section 19.

Participants means the Owner and each NOP that executes the Agreement.

Payment Certifier means the person appointed by the Owner to perform the role of the payment Certifier in the Agreement to certify payments to be paid or payable by the Owner to the NOPs under the Agreement.

Person includes an individual, a body corporate, company, firm, joint venture, partnership, trust, association or unincorporated body.

Personal Information means "personal information" as defined in FIPPA, which is collected, acquired, obtained by a Participant in relation to or in the course of providing the Alliance Works under this Agreement, and includes any information about an identifiable individual other than contact information, which is the name, position name or title, business telephone number, business address, business email or business fax number of the individual, or as otherwise defined in FIPPA.

Prime Contractor has the same meaning given to that term under the OHS Legislation.

Progress Payment Schedule means the payment certificate in the form set out in Schedule 6.

Project means the Cowichan District Hospital Replacement Project.

Project Alliance Objectives the Owner will assess the efficacy of the Alliance based on the ability of the Participants to achieve the following objectives:

(a) provision of a flexible and adaptable, state-of-the-art facility that, through incorporation of evidence-based design, improves the quality, safety, efficiency and effectiveness of health care delivery now and into the future;

(b) the successful delivery of the Project to achieve Substantial Completion by the target date for Substantial Completion and Substantial Commissioning by the Target date for Substantial Commissioning;

(c) delivery of the Project within the TOC;

(d) quality, sustainability and whole of life costs are considered in the design of the Project to deliver a facility that reduces the Owner's energy consumption and greenhouse gas emissions through enhanced energy conservation measures;

(e) develop a diverse and skilled construction workforce, that leverages the local community and skills, in a culturally safe and respectful work environment, including having a construction site free of racism and discrimination; and

(f) ensure the local community is represented and valued in the design, to provide a welcome and culturally sensitive and safe facility.

Project Proposal means the proposal submitted by the NOPs in accordance with the Alliance Development Agreement as accepted by the Owner.

PST means the tax imposed pursuant to the *Provincial Sales Tax Act* (British Columbia).

Records includes any and all records or documents relating to this Agreement or the performance of the Alliance Works which include both electronic or physical versions of data, ledgers, payroll, quality records, correspondence, information, software (including source code and object code versions) manuals, diagrams, instructions, measurements, calculations, drawings, plans, graphs, charts, projections, specifications, estimates, concepts, accounts, plans, formulae, designs, methods, techniques, processes, correspondence, invoices, dockets, receipts, vouchers, letters and papers of every description including all copies of and extracts from the same disclosed or produced in connection with or pursuant to this Agreement or the performance of the Alliance Works but excluding documents the subject of a valid claim of legal professional privilege (except in circumstances of common interest privilege), tax records (including taxation structuring advice), documents relating to the determination of Limb 2 and the NOPs' board papers or minute books.

Reimbursable Costs (also referred to as **Limb 1** and/or **Limb 1 Reimbursable Costs**) has the meaning given in Schedule 5.

Required Rating means a Rating of at least either A- (in respect of Standard & Poor's) or A3 (in respect of Moody's Investor Service).

Separable Portion means any part of the Alliance Works identified as Separable Portions in this Agreement or those parts of the Alliance Works determined by the Owner in accordance with Section 11.14 to be a Separable Portion of the Alliance Works.

Site means the lands identified in Schedule 2 as the Site, made available by the Owner to the Participants for the purposes of performing the Alliance Works.

Specification means the specifications set out in Schedule 2 as may be amended in accordance with this Agreement.

Subcontract means a subcontract, supply consultancy, works or services agreement or other arrangement which the Participants have entered into with a Subcontractor for the performance of any part of the Alliance Works.

Subcontractor means any Person engaged as a subcontractor to perform any part of the Alliance Works pursuant to the Subcontract and includes an agent, manufacturer, operator, professional advisor, contractor, supplier, consultant, subconsultant or service provider and any other provider of goods, materials, services or works.

Substantial Commissioning means that stage in the performance of the Alliance Works when:

(a) the Certificate of Substantial Completion has been issued in accordance with Section 11.7;

(b) the Alliance Works are complete except for minor omissions and minor Defects which the ALT determines:

  (i) do not prevent the Alliance Works from being reasonably capable of being used for their intended purpose; and

  (ii) the rectification of which will not adversely affect the safe and convenient use or operation of the Alliance Works;

(c) the ALT determines that all inspections, testing, verification, commissioning and certifications that are functionally required as identified in the approved commissioning plan to be completed at the time of Substantial Commissioning have been satisfactorily completed;

(d) the requirements of the Specification required to be satisfied, complied with or completed prior to or as a precondition of Substantial Completion have been satisfied, complied with or completed;

(e) the requirements of all relevant certifying and permitting authorities in respect of the Alliance Works that are required to be provided prior to or as a precondition of Substantial Completion have been met;

(f) the benefit of all material or substantial Subcontracts essential for the use, operation and maintenance of the Alliance Works have been assigned, or otherwise transferred, to the Owner, so that the Owner may exercise all rights under the Subcontract on and from the Substantial Completion Date in the manner required by Section 9.9.3;

(g) all documents and other information associated with the Alliance Works and essential for all use, operation and maintenance of the Alliance Works, including standard operating procedures, unit process guidelines, operations and maintenance manuals, and technical design data have been supplied to, and accepted by, the ALT;

(h) all operations and maintenance training and inductions have been performed and training manuals and materials are complete in order to enable the Owner to operate the Alliance Works; and

(i) the Payment Certifier has certified that substantial performance of the Alliance Works under the BLA has been achieved

Substantial Completion means that stage in the performance of the Alliance Works when:

(a) the Alliance Works are complete except for minor omissions and minor Defects which the ALT determines:

(i) do not prevent the Alliance Works from being reasonably capable of being used for their intended purpose; and

(ii) the rectification of which will not adversely affect the safe and convenient use or operation of the Alliance Works;

(b) Not Used;

(c) the requirements of the Specification required to be satisfied, complied with or completed prior to or as a precondition of Substantial Completion have been satisfied, complied with or completed;

(d) the requirements of all relevant certifying and permitting authorities in respect of the Alliance Works that are required to be provided prior to or as a precondition of Substantial Completion have been met;

(e) the benefit of all material or substantial Subcontracts essential for the use, operation and maintenance of the Alliance Works have been assigned, or otherwise transferred, to the Owner, so that the Owner may exercise all rights under the Subcontract on and from the Substantial Completion Date in the manner required by Section 9.9.3;

(f) all documents and other information associated with the Alliance Works and essential for all use, operation and maintenance of the Alliance Works, including standard operating procedures, unit process guidelines, operations and maintenance manuals, and technical design data have been supplied to, and accepted by, the ALT;

(g) all operations and maintenance training and inductions have been performed and training manuals and materials are complete in order to enable the Owner to operate the Alliance Works; and

(h) the Payment Certifier has certified that substantial performance of the Alliance Works under the BLA has been achieved.

Substantial Commissioning Date means the date certified in the Certificate of Substantial Commissioning that the Alliance Works achieved Substantial Commissioning.

Substantial Completion Date means the date certified in the Certificate of Substantial Completion that the Alliance Works achieved Substantial Completion.

Substantial Commissioning Report means the report referred to in Section 11.6A setting out the basis upon which the APM has certified that the Alliance Works have achieved Substantial Commissioning.

Substantial Completion Report means the report referred to in Section 11.6 setting out the basis upon which the APM has certified that the Alliance Works have achieved Substantial Completion.

Substitute Parent Company Guarantee has the meaning given in Section 19.2.

Target Outturn Cost (**TOC**) is the estimate accepted by the Owner of all costs and expense (including risk and contingency provisions) for us to perform our obligations under this Agreement as summarised in the Compensation Framework.

Target Cost Estimate (**TCE**) has the meaning given in Section S5.4.

Target Substantial Commissioning Date means the date 8 calendar weeks after the Substantial Completion Date.

Target Substantial Completion Date means the date identified in Section S1.6 of Schedule 1.

Temporary Works means work performed under this Agreement but not forming part of the Alliance Works.

Term has the meaning given in Section 23.

Whole of Life Costs has the meaning given in the Specification.

Wider Project Team (WPT) means the personnel managed by and reporting to the AMT in order to perform the Alliance Works.

Wilful Default means any of the following:

(a) an intentional or reckless act or omission by a Participant, or any of its officers or directors, or any of a Participant's representatives appointed to the ALT or AMT, which the Participant, or the relevant officer, director or representative knew or ought reasonably to have known:

(i) was dishonest, illegal, fraudulent or wrongful; or

(ii) would likely have harmful consequences or was carried out with disregard to harmful consequences;

(b) a failure by a Participant to pay monies within 20 Business Days (or such longer period agreed by the ALT) of monies becoming due under this Agreement including under any indemnity under this Agreement;

(c) an intentional or reckless act or omission by a Participant or any of its officers or directors or any of its representatives appointed to the ALT or AMT that:

(i) is a breach of any Law; or

(ii) prevents a Non-Defaulting Participant from performing a role, responsibility or function or discharging an obligation under any Law;

(d) a refusal of, or failure by, a Participant to effect and maintain, or to comply with, an insurance policy which it is required to effect and maintain under Section 14;

(e) a refusal of, or failure by, a Participant to ensure that all financial and commercial transactions are fully Open Book;

(f) a refusal of, or failure by, a Participant to comply with its audit obligations under Sections 7.9 to 7.15;

(g) an intentional or reckless refusal of, or an intentional or reckless failure by, a Participant to honour its confidentiality and publication obligations under Section 21.1;

(h) an intentional or reckless refusal of, or an intentional or reckless failure by, a Participant to honour its privacy obligations under Section 21.5;

(i) an intentional or reckless refusal of or an intentional or reckless failure by:

(i) a Participant or any of its officers or directors to act in Good Faith; or

(ii) any officer or representative of a Participant appointed to the ALT or AMT to act in Good Faith;

(j) a repudiation of this Agreement by a Participant;

(k) a failure by a NOP to comply with Section 13.3 (Infringe IPR);

(l) a failure by a NOP to comply with Section 20.1 (assignment or novation without consent);

(m) a failure by a NOP to comply with Section 24.2 (Change of Control without Owner consent);

(n) Not Used;

(o) a failure by a relevant NOP (as that term is defined in Section 19.6) to comply with a direction by the Owner issued in accordance with Section 19.6 (failure to provide an irrevocable letter of credit); or

(p) a Wilful Default as set out in Section 14.11 (breach of insurance policy),

but, with the exception of paragraph (p), does not mean any innocent act, omission, mistake or error of judgement, whether negligent or not, by a Participant or any of a Participant's officers or directors or any of its representatives appointed to the ALT or AMT acting in Good Faith.

Interpretation

S1.2 We agree that when interpreting this Agreement interpretations which are Best for Project and consistent with our Alliance Principles and our commitments in Section 2 are to be adopted.

S1.3 In this Agreement, unless the context otherwise requires:

(a) words or acronyms in the singular include the plural and vice versa;

(b) any gender includes the other genders;

(c) if a word or phrase is defined, its other grammatical forms have corresponding meanings;

(d) 'includes' means includes without limitation;

(e) no rule of construction will apply to a Section to the disadvantage of a party merely because that party put forward the Section or would otherwise benefit from it;

(f) if the date on or by which any act will be done under this Agreement is not a Business Day, the act will be done on or by the next Business Day;

(g) where the use of the acronym NOP in this Agreement is grammatically incorrect this Agreement will be interpreted as if the acronym NOPs replaced the acronym NOP; and

(h) a reference to:

(i) 'we', 'us' or 'our' is a collective reference to the Participants and, to the extent necessary in the circumstances, includes representatives of IBC and BCIB participating in the governance of the alliance and/or the performance of the Alliance Works;

(ii) a Person includes the person's legal personal representatives, successors, assigns and persons substituted by novation;

(iii) an obligation includes a warranty or representation and a reference to a failure to comply with an obligation includes a breach of warranty or representation;

(iv) '$', 'dollars' or 'CAD' is a reference to the lawful currency of Canada;

(v) this Agreement is a reference to this entire agreement including all Schedules, appendices and exhibits to it and any obligation of a party included in, expressly or by reference, or referred to in the agreement or any Schedule, appendix or exhibit to this Agreement;

(vi) a Section, a Schedule or an exhibit is, unless otherwise stated, a reference to a Section, Schedule or an exhibit of or to this Agreement;

(vii) references and cross-references to provisions of this Agreement prefaced with "S" are a reference to the corresponding provision in a Schedule to this Agreement;

(viii) proceedings includes reference, litigation, arbitration, and investigation;

(ix) time is a reference to the time in Victoria, British Columbia;

(x) a period of time is specified and dates from, after or before, a given day or the day of an act or event, and is to be calculated exclusive of that day;

(xi) any agreement or document is to that agreement or document as amended, notated, supplemented, varied or replaced from time to time;

(xii) anything (including any right) includes any part of that thing, but nothing in this paragraph (xii) implies that performance of part of an obligation constitutes performance of the entire obligation;

(xiii) any legislation includes all subordinate or delegated legislation made under it and amendments, consolidations, replacements or re-enactments of any of them all as modified or replaced;

(xiv) liquidation includes official management, appointment of an administrator, compromise, arrangement, merger, amalgamation, reconstruction, winding-up, dissolution, assignment

for the benefit of creditors, scheme, composition or arrangement with creditors, insolvency, bankruptcy, or any similar procedure or, where applicable, changes in the constitution of any partnership or person, or death;

(xv) the obligation to comply with any document referenced in this Agreement remains an obligation, but the document so referenced will not form part of this Agreement; and

(xvi) whenever any matter is stated to be at the discretion of the Owner, the Owner may act in its absolute and unfettered discretion, which may be exercised for purposes connected with this Agreement or otherwise in the interests of the Owner.

Language

S1.4 All information and documentation prepared and/or delivered by us under this Agreement will be in English.

Ambiguity, Discrepancy and Inconsistency

S1.5 The ALT will promptly notify the Owner of any ambiguity, discrepancy or inconsistency in the documents comprising this Agreement together with the ALT's recommendation to resolve the ambiguity, discrepancy or inconsistency. The Owner will determine the resolution of any ambiguity, discrepancy or inconsistency in the documents comprising this Agreement.

Detailed Particulars

S1.6 The detailed particulars of the Alliance Agreement are set out below:

Section	Term/Description	Details
S1.1	The Owner's Representative	Kim Kerrone
S1.1	Target Substantial Completion Date	November 27, 2026
7.4, 7.7 and 7.8	Period for maintenance of Records	In respect of any Record the original, or a copy, of which is not provided to the Owner prior to the Final Completion Date, the expiry of seven years after Final Completion
21	Period that Confidentiality and Personal Information provisions apply	Five years after the Final Completion Date
7.9	Period for Audit	Seven years after the Final Completion Date.
22	Address for notices	**The Owner** Vancouver Island Health Authority Administration Building, 1952 Bay St - Room 349 Victoria BC, V8R 1J8 Attention: Kim Kerrone

Section	Term/Description	Details
		Email: kim.kerrone@islandhealth.ca ***NOPs:*** EllisDon Corporation 310 - 140 Quarry Park Boulevard SE Calgary, AB T2C 3G3 Attention: Sean Dekoning Email: sdekoning@ellisdon.com With a copy to: Attention: Jeff Fox Email: jfox@ellisdon.com Attention: Sean Quimby Email: squimby@ellisdon.com Parkin Architects Western Ltd. 675 West Hastings St., Suite 1100 Vancouver, BC V6J 1K7 Attention: Robert Cameron Shantz Email: shantz@parkin.ca

SCHEDULE 2
SPECIFICATION - ALLIANCE WORKS AND PROJECT DESCRIPTION

COWICHAN DISTRICT HOSPITAL REPLACEMENT PROJECT

SCHEDULE 2: ALLIANCE WORKS AND PROJECT DESCRIPTION

PROJECT ALLIANCE AGREEMENT

ACKNOWLEDGEMENTS

Before the formation of Canada and British Columbia, Indigenous peoples lived in balance and interconnectedness with the land, waters, sky, and other beings. This balance and interconnectedness were integral to the health and wellbeing of all. Today, health disparities exist and persist due to the impacts of colonization and Indigenous-specific racism.

Island Health acknowledges and recognizes the Coast Salish, Nuu-chah-nulth and Kwakawaka'wakw peoples who have lived on and cared for this place since time immemorial. We acknowledge their enduring relationship to this place and are grateful for our ability to work and live here.

In particular, we thank the Cowichan Tribes, Ditidaht, Halalt, Ts'uubaa-asatx Nation formerly known as Lake Cowichan, Lyackson, Malahat, Pacheedaht, Penelakut, Stz'uminus First Nations communities, Metis Nation communities, and Hiiye'yu Lelum – House of Friendship for welcoming us as we learn and build relationships to do this work together.

We specifically pay our respects to the Elders past and present.

We are grateful to work with First Nations Health Authority as a valued partner in collaborative knowledge generation initiatives.

1 INTERPRETATION

1.1 Definitions

1.1.1 In this Schedule 2: Alliance Works and Project Description and Appendices, in addition to the definitions set out in Schedule 1 Definitions and Interpretation of this Project Alliance Agreement the following definitions will apply:

.1 "AHJ" means Authority Having Jurisdiction;

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

"Authority Having Jurisdiction" means the organization, office or individual having statutory responsibility for enforcing requirements or Standards;

.4 "BC Hydro" means British Columbia Hydro and Power Authority;

"Biophilia" means an innate and genetically determined affinity of human beings with the natural world according to theory by E.O. Wilson;

.6 "Building" means the new Cowichan District Hospital;

.7 "CACF" means Command and Control Facility also known as the Fire Alarm System Main Annunciator Panel typically located in the Fire Department response location;

.8 Not Used

Not Used

"CSA" means the Canadian Standards Association, an accredited standards development organization and certification body;

.11 "GHG" means greenhouse gas expressed as tCO2e;

.12 "Climate Lens" means the assessment framework developed by Infrastructure Canada in 2018. It helps decision makers understand the climate change risks and impacts associated with the Design;

.13 "Climatic Parameters" means defined climate parameters based on meteorological data used for calculation of energy performance in Buildings.

.14 "Construction" means all things, other than Design, necessary to complete the Alliance Works;

.15 "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;

.16 "Cooling Degree Days" means a measurement Designed to quantify the demand for energy needed to cool Buildings. It is the number of degrees that a day's average temperature is above 19 degrees Celsius;

.17 "Design" means the Design for the Project;

.18 "Design Principles" means the overarching Design requirements that guide and instruct the Design of the Project;

.19 "Drawings" means all drawings for the Project that are prepared by or for the Participants and that the are approved to proceed with;

.20 "EUI" means energy use index and is the total of all energy consumed on the Site in one year divided by gross floor area and expressed as kWh/m2;

.21 "Facility" means the Buildings, related structures, utility connections, landscaping and other improvements to be constructed by the Participants pursuant to this Project Alliance Agreement;

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

.23 "Heating Degree Days" means a measurement Designed to quantify the demand for energy needed to heat a Building;

.24 "Indigenous Advisory Council" means the Indigenous advisory group created to review, advise and provide instructions on and for Indigenous culture on the Project;

.25 "IUCN Red List" means the International Union for Conservation of Nature Red List of Threatened Species;

.26 "Lead Equivalence" means the thickness of lead that provides the same level of attenuation (reduction of radiation passing through) as material considered for lead equivalency; lead equivalence specified for materials used in diagnostic X-ray rooms is measured at 150 kV;

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

.28 "LEED Rating System" means USGBC's Leadership in Energy & Environmental Design (LEED) Green Building Rating System v4 BD + C: Healthcare;

.29 "Master Site Plan" means a long term Site plan that includes conceptual development to guide future growth and development;

.30 "Municipality" means Municipality of North Cowichan;

.31 "Preliminary Climate Risk Assessment" means preliminary assessment made on the climate risks for the Project which is in the Data Room;

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

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

.34 "Record Drawings" means the as-built BIM models, Drawings and Specifications that record the completed Facility;

.35 "RPC 8.5" means the representative concentration pathway adopted by the IPCC for its Fifth Assessment Report (AR5) in 2014 and 8.5 means the level of positive radiative forcing units on W/m2 due to additional GHG in the atmosphere. This reflects a "business as usual" trajectory without additional strategies to constrain emissions;

.36 "Service Centre" means the Building area Designed to house the main mechanical (excluding HAVC penthouses), and electrical services for the Facility;

.37 "Site Plan" means the plan of the Site illustrating the Building footprints, parking, landscape and Site circulation systems;

.38 "Specifications" means all Construction and other specifications for the Project prepared by or for which the Participants are approved to proceed;

.39 "Standard" means any and all Laws, professional Standards and specifications applicable to the Alliance Works for the Project, as they are in force from time to time in the latest current version thereof;

.40 "Statement of Requirements" means Schedule 2: Alliance Works And Project Description and Appendices;

.41 "Submittal" means any and all items, documents and anything else required or specified by this Project Alliance Agreement and any and all subsequent revisions, amendments and changes thereto, in respect of the Design and the Construction to be submitted to, reviewed, accepted or otherwise processed or considered by the Participants;

.42 "TEDI" means thermal energy demand intensity is a metric that represents the annual heating load per unit of floor area of a Building. This is the amount of heat needed to offset the heat loss through the Building envelope and condition the ventilation air. It is expressed as kWh/m2;

.43 Not Used

.44 "Welcome Figures" means the three dimensional sculptural figures; and

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

1.2 Interpretation

1.2.1 This Schedule is written as a performance specification and defines what the Participants must achieve in the Design and Construction. Except as expressly stated otherwise, the Participants will carry out the Design and Construction as required and contemplated by each provision of this Schedule and its Appendices whether or not the provision is written as an obligation of the Participants or is stated in the imperative form.

1.2.2 Where "cost effective", "appropriate", "sufficient", "minimize" and related and similar terms are used, they are to be construed and interpreted in terms of whether they are cost effective, appropriate, sufficient, minimizing, etc. from the perspective of a prudent public owner of a community acute care hospital Facility who balances capital costs against maintenance, operations, clinical efficiency and other non-capital costs over the life of the Facility.

1.2.3 Unless expressly stated otherwise, each reference to a standard in this document will be deemed to mean the latest version of that standard as of the Commencement Date.

1.3 Acronym List

1.3.1 The following is the acronym list:

AAMA – American Architectural Manufacturers Association

AAS – Aluminum Association Standards

ABG - Arterial Blood Gases

.4 ABHR – Alcohol Based Hand Rub

ACI – American Concrete Institute

.6 ADC – Automatic Dispensing Cabinet

.7 ADL - Activities of Daily Living

ADT - Admission Discharge Transfer

.9 AECB – Atomic Energy Control Board

AED – Automated External Defibrillator

.11 AFFL - Above Finished Floor Level

.12 AFUE – Annual Fuel Utilization Efficiency

.13 AHC – Architectural Hardware Consultant

.14 AH/IT - Allied Health / Interprofessional Team

.15 AHJ – Authority Having Jurisdiction

.16 AIBC – Architectural Institute of British Columbia

.17 AIR – Airborne Isolation Room

.18 AISI – American Iron and Steel Institute

.19 ALOS - Average Length of Stay

.20 AMCA – Air Movement and Control Association

.21 ANSI – American National Standards Institute

.22 ARCAL – Aircraft Radio Control of Aerodrome Lighting

.23 ARDS - Acute Respiratory Distress Syndrome

.24 ARI – Air Conditioning and Refrigeration Institute

.25 ARPA – Authorized Radiation Protection Agency

.26 ASHRAE – American Society of Heating, Refrigerating and Air-conditioning Engineers

.27 ASME – American Society of Mechanical Engineers

.28 ASPE – American Society of Plumbing Engineers

.29 ASTM – American Society for Testing and Materials

.30 AV / IT – Audio Visual / Information Technology

.31 AWCC – Association of Wall and Ceiling Contractors

.32 AWMAC – Architectural Woodwork Manufacturers Association of Canada

.33 AWPA - American Wood Protection Association

.34 AWWA – American Water Works Association

.35 BCAS - BC Ambulance Service

.36 BCBC – British Columbia Building Code

.37 BCERMS – British Columbia Emergency Response Management System

.38 BCC - BC Cancer

.39 BCCA - BC Cancer Agency

.40 BCICA – British Columbia Insulation Contractors Association

.41 BCIT - British Columbia Institute of Technology

.42 BCLNA – British Columbia Landscape & Nursery Association

.43 BCLS: British Columbia Landscape Standard
.44 BCSLA – British Columbia Society of Landscape Architects
.45 BICSI – Building Industry Consulting Service International
.46 Bi-PAP - Bilevel Positive Airway Pressure
.47 BMD - Bone Mineral Densitometry
.48 BMS – Building Management System
.49 BSC – Biological Safety Cabinet
.50 CAC – Ceiling Attenuation Class
.51 CATV – Community Access Television
.52 CCI - Canadian Classification of Health Interventions
.53 CCD – Charge Couple Device
.54 CCHSA - Canadian Council on Health Services Accreditation
.55 CCTV – Closed Circuit Television
.56 CDHRP – Cowichan District Hospital Replacement Project
.57 CDP – Central Distribution Panel
.58 CEC – Canadian Electrical Code
.59 CFC - Chlorofluorocarbon
.60 CFL – Compact Fluorescent Lamp
.61 CGA - Compressed Gas Association
.62 CGSB – Canadian General Standards Board
.63 CGSM - Component Gross Square Metres
.64 CIF – Common Intermediate Format
.65 CIVA - Central Intravenous Additive Services
.66 CISC – The Canadian Institute of Steel Construction
.67 CISCA – Ceiling Interior Systems Construction Association
.68 CLS – Canadian Landscape Standard
.69 CMCA – Canadian Masonry Contractors Association
.70 CNSC – Canadian Nuclear Safety Commission
.71 CODEC – Coder/Decoder
.72 COW - Computer on Wheels
.73 C-PEC/PEC - Containment Primary Engineering Control
.74 CPI - Centre for Process Innovation
.75 CPMA – Canadian Paint Manufacturer's Association
.76 CPOE - Computerized Physician Order Entry
.77 CPTED – Crime Prevention Through Environmental Design
.78 CPU – Central Processing Unit

.79 CRI/IAQ – Canadian Rug Institute/Indoor Air Quality Program
.80 CRT – Cathode Ray Tube
.81 CRU - Community Response Unit
.82 CRTC – Canadian Radio-television and Telecommunications Commission
.83 CSA – Canadian Standards Association
.84 CSDFMA – Canadian Steel Door and Frame Manufacturers Association
.85 CSSBI – Canadian Sheet Steel Building Institute
.86 CT - Computerized Tomography
.87 CTAS - Canadian Triage & Acuity Scale
.88 CTI – Cooling Technology Institute
.89 CWB – Canadian Welding Bureau
.90 CxA – Commissioning Authority
.91 D&T – Diagnostic and Treatment
.92 dB – Decibels
.93 dBA – A-Weighed sound pressure level
.94 DDC – Direct Digital Controls
.95 DFO – Department of Fisheries and Oceans
.96 DHI – Door and Hardware Institute
.97 DID – Direct Inward Dialling
.98 DISS – Diameter Index Safety System
.99 DSSS – Direct Sequence Spread Spectrum
.100 DST - Decision Support Tool
.101 EBD - Evidence-Based Design
.102 ECG – Electrocardiogram
.103 ECT - Electroconvulsive Therapy
.104 EDI - Electronic Data Interchange
.105 EEG – Electroencephalogram
.106 EGBC – Engineers and Geoscientists British Columbia
.107 EHR - Electronic Health Record
.108 EIA/TIA – Electronics Industry Association/Telecommunications Industry Association
.109 eMAR - Electronic Medication Administration Record
.110 EMT – Electric Metallic Tubing
.111 EMR - Electronic Medical Record
.112 EMC - Emergency Medical Services
.113 ENS – Environmental Notation System
.114 EOC – Emergency Operations Centre

.115 EPA – Environmental Protection Agency
.116 ES – Emergency Services
.117 ESS – Electronic Safety & Security
.118 ETL – Electronic Testing Laboratories
.119 EUI – Energy Use Index
.120 FACP – Fire Alarm Control Panel
.121 FATO – Final Approach and Take-off Area
.122 FM – Facilities Management
.123 FM – Factory Mutual
.124 FMO – Facilities Maintenance and Operations
.125 FoM – Faculty of Medicine
.126 FS – Food Services
.127 FTE - Full-Time Equivalent
.128 FUS- Fire Underwriters Survey
.129 GCA – Glazing Contractors Association of British Columbia
.130 GFI – Ground Fault Interrupter
.131 GHG - Greenhouse Gas
.132 GPS – Global Positioning Satellite
.133 GWP – Global Warming Potential
.134 HACCP - Hazard Analysis & Critical Control Point
.135 HAU – High Acuity Unit
.136 HAZMAT – Hazardous Materials
.137 HEPA – High Efficiency Particulate Air
.138 HFC - Hydrofluorocarbon
.139 HH - Hand Hygiene
.140 HHS - Hand Hygiene Sink
.141 HIMS – Health Information Management Services
.142 HOA – Hand/Off/Auto
.143 HP – Horsepower
.144 HAS – Health Services Administrator
.145 HRC – High Rupting Capacity (fuse type)
.146 Ht/hts - height / heights
.147 HVAC – Heating, Ventilating and Air-Conditioning
.148 IIABC – Irrigation Industry Association of British Columbia
.149 IBMP – Integrated Building Management Platform
.150 ICU – Intensive Care Unit

.151 ICUN – International Union for Conservation of Nature
.152 IDS / IPS – Intrusion Detection System / Intrusion Prevention System
.153 IEEE – Institute of Electrical and Electronic Engineers
.154 IIABC - Irrigation Industry Association of British Columbia
.155 IIC – Impact Isolation Class
.156 IGMAC – International Glazing Manufacturers Association of Canada
.157 IP – Internet Protocol
.158 IPAC - Infection Prevention & Control
.159 IPU – Inpatient Unit
.160 IMIT – Information Management Information Technology
.161 ISA - International Society of Arboriculture
.162 ITIL – Information Technology / Telecommunication
.163 kW – Kilowatt
.164 kWh – Kilowatt hours
.165 kV – Kilovolt
.166 kVA – Kilovolt Ampere
.167 LAN – Local Area Network
.168 LCD – Liquid Crystal Display
.169 LED – Light Emitting Diode
.170 LEED – Leadership in Energy and Environmental Design
.171 LIS – Laboratory Information System
.172 Mb – Megabit
.173 MEP – Mechanical, Electrical and Plumbing
.174 MCP – Motor Circuit Protector
.175 MHAS - Mental Health & Addiction Services
.176 MM – Materiel Management
.177 MMCD – Master Municipal Construction Documents
.178 MOA - Memorandum of Agreement
.179 MOH - Ministry of Health
.180 MOLTI- Ministry of Transportation and Infrastructure
.181 MPI – Master Painters Institute
.182 MRI - Magnetic Resonance Imaging
.183 MTICS – Ministry of Technology, Innovation and Citizen's Services
.184 NAAMM – National Association of Architectural Metal Manufacturers
.185 NAPRA - National Association of Pharmacy Regulatory Authorities
.186 NC – Noise Criteria

.187 NCFD – North Cowichan Fire Department
.188 NCRP&M – National Council on Radiation Protection and Measurement
.189 NEMA – National Electrical Standards Association
.190 NFC – National Fire Code of Canada
.191 NFCA – National Floor Covering Association
.192 NFPA – National Fire Protection Association
.193 NIC – Noise Isolation Class
.194 NOx- Oxides of Nitrogen
.195 NRC – Noise Reduction Coefficient
.196 NSM - Net Square Metres
.197 NTSC – National Television Standards Committee
.198 NVG – Night Vision Goggles
.199 NVIS – Night Vision Imaging Systems
.200 ODP – Ozone Depletion Potential
.201 OFDM – Orthogonal Frequency Division Multiplexing
.202 OH&S - Occupational Health & Safety
.203 OS&Y – Open Stem and Yoke
.204 PACS - Picture Archiving and Communication System
.205 PBX – Private Branch Exchange
.206 pc - Piece
.207 PC – Personal Computer
.208 PCR – Primary Communications Room
.209 PDA – Personal Digital Assistant
.210 PER – Primary Equipment Room
.211 PHSA – Provincial Health Services Authority
.212 PI – Privacy Index
.213 PIEVC – Public Infrastructure Engineering Vulnerability Committee
.214 PICC - Peripherally Inserted Central Catheter
.215 PoC – Point of Care
.216 PoE – Power Over Ethernet
.217 PoU - Point-of-Use
.218 PPE - Personal Protective Equipment
.219 PR - Patient Registration
.220 PRV - Pressure Reducing Valves
.221 PTN - Patient Transfer Network
.222 PTZ – Pan Tilt Zoom

.223 PVC – Polyvinyl Chloride
.224 QA – Quality Assurance
.225 RCABC – Roofing Contractors Association of British Columbia
.226 RCP – Representative Concentration Pathway
.227 RCMP – Royal Canadian Mounted Police
.228 RCDD – Registered Communications Distribution Designer
.229 RF – Radio Frequency
.230 RFID – Radio Frequency Identification
.231 RIS - Radiology Information System
.232 RO – Reverse Osmosis
.233 RT60 – Reverberation Time
.234 RTLS – Real Time Location System
.235 SAGA – System of Approach Azimuthal Guidance
.236 SCR – Secondary Communications Room
.237 SER – Secondary Equipment Room
.238 SES – Safety Engineering Society
.239 SIP – Session Initiated Protocol
.240 SMACNA – Sheet Metal and Air Conditioning Contractors National Association
.241 SMDR – Station Message Detail Recording
.242 SNR – Signal to Noise Ratio
.243 SPECT - Single-Photon Emission Computed Tomography
.244 SQL – Structured Query Language
.245 SSBC – Shared Services of British Columbia
.246 STC – Sound Transmission Class
.247 STI – Speech Transmission Index
.248 TCO – Total Cost of Ownership
.249 TCP – Transmission Control Protocol
.250 TDM – Time Division Multiplexing
.251 THD – Total Harmonic Distortion
.252 TEDI - Thermal Energy Demand Intensity
.253 TLOF – Touchdown and Lift-off Area
.254 TNK – Tenecteplase
.255 TPA - Tissue Plasminogen Activator
.256 TRUC - Tertiary Resource Utilization Coordinator
.257 TTMAC – Terrazzo and Tile Manufacturers Association of Canada
.258 TVOC – Total Volatile Organic Compounds

.259 TVSS – Transient Voltage Surge Suppressor

.260 UBC, FOM – University of British Columbia, Faculty of Medicine

.261 UBCV - University of British Columbia Vancouver

.262 ULC – Underwriters' Laboratories of Canada

.263 UPS – Uninterruptible Power Supply

.264 USGBC – United States Green Building Council

.265 UVic - University of Victoria

.266 US – Ultrasound

.267 USP - U.S. Pharmacopoeia

.268 V - Volt

.269 VAR – Volt Ampere Reactive power

.270 VFD – Variable Frequency Drive

.271 VLAN – Virtual Local Area Network

.272 VOC – Volatile Organic Compounds

.273 VoIP – Voice Over Internet Protocol

.274 WAG - Wasted Anaesthetic Gas

.275 WAN – Wide Area Network

.276 WAP2 – Wireless Application Protocol 2

.277 WC – Water Closet (Washroom)

.278 WCB - Workers Compensation Board

.279 WH – Warnock Hersey

.280 WH & S - Workplace Health & Safety

.281 WHMIS - Workplace Hazardous Materials Information System

.282 WMM – WiFi Multimedia

.283 WSBC - WorkSafe British Columbia

2 GENERAL

2.1 Applicability of Specifications to the Facility

2.1.1 The Schedule 2: Alliance Works and Project Description and Appendices set out Design and Construction specifications for the Cowichan District Hospital Replacement Project (CDHRP), which is a new replacement Facility for the existing Cowichan District Hospital on a greenfield Site.

2.2 Project Overview

2.2.1 The Participants will provide the following elements of the CDHRP:

A Building defined as a Diagnostic and Treatment (D&T) Block, a separate and physically connected Inpatient Unit (IPU) Tower and a Service Centre;

.2 A roof mounted Heliport situated on the southeast corner of the Inpatient Tower to achieve the best flight path options and optimum heliport operations;

Four-vehicle sheltered ambulance bays, and exterior parking for police vehicles or other emergency related vehicles;

.4 A defined exterior location for a mobile trailer and a catastrophic event management tent area complete with services kiosk adjacent to the Emergency Department;

.5 Associated parking and landscaping for parking areas;

.6 Loading Dock, ramp access and semitrailer maneuvering area;

.7 The FMO maintenance compound/s are for vehicle garage and services located adjacent to main Building and integrated with the Loading Dock area fuel storage, medical gases and other required services may be provided for in a separate FMO compound;

Therapeutic gardens, Site landscaping and associated outdoor art installations;

On and off-Site services as required;

Provision of two perimeter access roads: Hospital Road North and Hospital Road South; and

.11 Associated Alliance Works and service Buildings.

2.2.2 The Site for the Facility is located at 6775 Bell McKinnon Road, north of the City of Duncan, B.C. and southeast of the intersection of Highway 1 and Highway 18.

2.2.3 The property is approximately 9.3 hectares in area.

2.2.4 The Participants will identify Site areas for expansion of the CDHRP and areas for CDHRP replacement. Refer to Section 3.2.

2.3 General Standards of Design and Construction

2.3.1 General

The Participants will undertake all Design and Construction:

a) in accordance with the Standards set out in this Schedule and all other Schedules to this Project Alliance Agreement;

in compliance all applicable codes and Laws current at the time of issuance of a Building permit;

in accordance with all relevant CSA Standards;

having regard for the concerns, needs and interests of:

all persons who will be Facility and Site Users;

all Governmental Authorities; and

the community.

To the same standard that an experienced, prudent and knowledgeable long-term owner of a high-quality health care Facility in North America operated publicly would employ;

f) In accordance with CSA Z8000 Canadian Healthcare Facilities unless otherwise agreed to by the Owner, however, in the event of any conflict between CSA Z8000 and the express provisions of this Schedule 2, then the highest such standard will

apply, except for Appendix 2A - Clinical Specifications area requirements in the Schedule of Accommodations for each functional component which will govern.

g) If the Participants wishes to make reference to a code or standard from a jurisdiction outside of Canada, then the Participants will demonstrate to the Owner's satisfaction that such code or standard meets or exceeds the requirements of this Schedule.

h) Unless expressly stated otherwise, each reference to a code or standard in this Schedule will be deemed to mean the latest version of that code or standard.

i) Compliance with codes and Standards noted in this Schedule 2 whether noted in general or expressly referenced is mandatory.

j) Without limiting any of the above and notwithstanding any other provision of this Schedule the Participants will undertake all Design and Construction in compliance with codes that are not specifically referred to in this Schedule 2 if required to meet other Standards set out above, including municipal bylaws.

2.3.2 The Participants will meet the requirements set out in this Schedule 2. The Participants will undertake the Design and Construction in compliance with all applicable Standards, including the following:

AAMA 501.8 Standard Test Method for Determination of Resistance to Human Impact of Window Systems Intended for Use in Psychiatric Application;

.2 AAMI TIR 34; Water for Reprocessing of Medical Devices;

AISI (American Iron and Steel Institute):

AISI S100 – North American Specification for Design of cold formed Steel Structural Members (including commentary);

AISI 200 – North American Standard for Cold Formed Steel Framing (general provisions);

c) AISI 201 – North American Standard for Cold Formed Steel Framing (Product Data);

.4 AHRI (Air-Conditioning, Heating, & Refrigeration Institute):

AHRI Standard 550/590 – Performance Rating of Water-Chilling and Heat Pump Water-Heating Packages Using the Vapor Compression Cycle.

.5 ANSI (American National Standards Institute):

ANSI C37.121 – Unit Substations Requirements.

ANSI/AIHI/ASSP Z9.5 – Laboratory Ventilation.

ANSI / ASME (American National Standards Institute / American Society of Mechanical Engineers)

AWS D11.3 – Structural Welding Code – Sheet Steel;

ACI 315 – Details and Detailing of Concrete Reinforcement;

ACI 315R – Manual of Engineering and Placing Drawings for Reinforced Concrete Structures

ANSI/ASME A13.1 – Visibility Standard (Pipe Labeling);

ANSI/ASME B16 – Piping Component Standards;

ASME B31 – Pressure Piping Code;

g) ASME B36 – Piping Standards;

h) ISEA Z358.1: Emergency Eyewash and Shower Equipment;

i) ASME BPVC Section VIII – Pressure Vessels;

j) ASME BPVC Section IX – Welding Qualifications; and

k) Unfired Pressure Vessels;

.7 ANSI / IES (American National Standards Institute / Illuminating Engineering Society):

ANSI/IES RP 29 Lighting for Hospitals and Health Care Facilities;

ANSI / TIA (American National Standards Institute / Telecommunications Industry Association):

TIA 942 – Telecommunications Infrastructure Standard for Data Centers; and

TIA TSB-162 – Telecommunications Cabling Guidelines for Wireless Access Points;

c) TIA 1179 – Standard for Healthcare Facility Telecommunications Infrastructure Standard

ASHRAE (American Society of Heating, Refrigeration and Air-Conditioning Engineers)

a) ASHRAE Handbooks: Fundamentals, Refrigeration, HVAC Applications, HVAC Systems and Equipment, Smoke Control Engineering;

ASHRAE Guideline 1 – The HVAC Commissioning Process;

ASHRAE Guideline 12 – Minimizing the Risk of Legionella Associated with Building Water Systems;

ASHRAE Standard 52.2 – Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size;

ASHRAE Standard 55 – Thermal Environmental Conditions for Human Occupancy;

f) ASHRAE Standard 62.1 – Ventilation for Acceptable Air Quality;

g) ASHRAE Standard 90.1 – Energy Standard for Buildings, Except Low-Rise Residential Buildings

h) ASHRAE Standard 111 – Practices for Measurement, Testing, Adjusting and Balancing of Building HVAC systems;

i) ASHRAE Standard 129 – Measuring Air Change Effectiveness;

ASHRAE Standard 514 – Building Water Management Standard;

ASHRAE Standard 135 – The BACnet Standard, Data Communication Protocol for Building Automation and Control Network;

.10 ASPE (American Society of Plumbing Engineers)

ASPE Plumbing Engineering Design Handbook, Volumes 1 – 4;

.11 ASTM (American Society for Testing and Materials):

ASTM A27 – Specification for Steel Castings, Carbon, for General Application;

ASTM A36 A36M – Standard Specification for Carbon Structural Steel;

c) ASTM A82/A82M – Standard Specification for Steel Wire, Plain, for Concrete Reinforcement;

d) ASTM A185 – Standard Specification for Steel Welded Wire Fabric;

ASTM A193 / A193M – Standard Specification for Alloy–Steel and Stainless-Steel Bolting for High Temperature or High-Pressure Service and Other Special Purpose Applications;

ASTM A307 – Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60000 PSI Tensile Strength;

ASTM A325 – Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength;

ASTM A326M – Standard Specification for Structural Bolts, Steel, Bolts, Steel, Heat Treated, 830 MPa Minimum Tensile Strength (Metric);

ASTM A490 – Standard Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Steel Strength;

j) ASTM A490M – Standard Specification for High Strength Structural Steel Bolts, Classes 10.9 and 10.9.3, for Structural Steel joints (Metric);

k) ASTM A653/A653M – Standard Specification for Steel Sheet Zinc Coated (Galvanized) or Zinc-Iron Alloy- Coated (Galvannealed) by the Hot- Dip Process;

ASTM A775 – Specifications for Epoxy Coated Reinforcing Steel;

ASTM A792 – Specification for Sheet Steel 55% Aluminum – Zinc Alloy coated by hot dip process;

n) ASTM A955 – Standard Specification for Load Bearing (transverse and axial) Steel Studs, Runners (tracks) and bracing or Bridging for screw application of Gypsum Panel products;

o) ASTM B29 – Standard Specification for Refined Lead;

p) ASTM B749 – Specification for Lead and Lead Alloy Strip, Sheet and Plate Products;

q) ASTM B88 – Copper Piping;

r) ASTM B221M – Standard Specification for Aluminum and Aluminum- Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric);

ASTM C260 / C260M – Standard Specification for Air-Entraining Admixtures for Concrete;

t) ASTM C309 – Specification for Liquid Membrane Forming Compounds for Curing Concrete;

u) ASTM C494 / C494M – Standard Specification for Chemical Admixtures for Concrete;

v) ASTM C503 – Standard Specification for Marble Dimension Stone;

w) ASTM C568 – Standard Specification for Limestone Dimension Stone;

x) ASTM C615 – Standard Specification for Granite Dimension Stone;

y) ASTM C616 – Standard Specification for Quartz-Based Dimension Stone;

z) ASTM C645 – Standard Specification for Non-structural Steel Framing Members;

aa) ASTM C1396/C1396M - Standard Specification for Gypsum Board;

bb) ASTM E1155 – Standard Test Method for Determination of FF Floor Flatness and FL Floor Levelness Numbers;

cc) ASTM E336 – Standard Test Method for Measurement of Airborne Sound

Attenuation Between Rooms in Buildings.

dd) ASTM E917 – Life Cycle Cost Assessment Methodology;

ee) ASTM F710 – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring;

ff) ASTM F1233 – Test Method for Security Glazing Materials And Systems;

gg) ASTM F1450 – Test Methods for Hollow Metal Swinging Door Assemblies for Detention and Correctional Facilities;

hh) ASTM F1577 – Test Methods for Detention Locks for Swinging Doors;

ii) ASTM F1592 – Test Methods for Detention Hollow Metal Vision Systems;

jj) ASTM F1643 – Test Methods for Detention Sliding Door Locking Device Assembly;

kk) ASTM F1758 – Test Methods for Detention Hinges Used on Detention- Grade Swinging Doors;

ll) ASTM F1869 – Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride;

mm) ASTM F1915 – Standard Test Methods for Glazing for Detention Facilities;

American Conference of Governmental Hygienists, Industrial Ventilation: A Manual of Recommended Practice;

.13 BC Building Code;

.14 BC Guidelines for Decontamination of Patients in Health Facilities.

.15 BC Supplement to TAC Geometric Design Guide;

.16 BCICA Quality Standards Manual for Mechanical Insultation;

.17 BICSI Telecommunications Distribution Methods Manual (TDMM);

.18 BCLNA - British Columbia Landscape & Nursery Association;

BC Landscape Standard;

Plant Materials;

c) Growing Medium;

Landscape Maintenance;

Tree Protection and Preservation; and

Irrigation Design.

.19 BC Active Transportation Design Guide;

.20 British Columbia Ministry of Health Provincial Hand Hygiene Group – Best Practices for Hand Hygiene in All Healthcare Settings and Programs July 2012;

.21 Province of British Columbia Provincial Quality, Health & Safety Standards and Guidelines for Secure Rooms in Designated Mental Health Facilities under the B.C. Mental Health Act;

.22 CIRIA R139: Construction Industry Research and Information Society – Water-Resisting Basements;

.23 City of Vancouver Energy Modelling Guidelines Version 2;

.24 Code Plus: Physical Design Components for an Elder Friendly Hospital";

.25 CSA Group

CSA A23.1/A23.2 - Concrete Materials and Methods of Concrete Construction / Methods of Test and Standard Practices for Concrete

CSA A23.3 – Design of Concrete Structures

CSA A23.4 - Precast Concrete - Materials and Construction

CAN/CSA A165 Series – CSA Standards on Concrete Masonry Units consists of: A165.1, A165.2, A165.3;

e) CSA A370 - Connectors for Masonry;

f) CAN/CSA-A371 – Masonry Construction for Buildings;

g) CSA B44 Safety Code for Elevators and Escalators;

h) CSA B45 Series: Plumbing Fixtures;

i) CSA B64 Series: Backflow Preventers and Vacuum Breakers;

CSA B651 – Accessible Design for the Built Environment;

CSA B52HB: Mechanical Refrigeration Code;

l) CSA B125: Plumbing Fittings;

m) CSA B139: Installation Code for Oil-Burning Equipment;

CSA B149.1: Natural Gas and Propane Installation Code;

o) CSA B651 – Accessible Design for the Built Environment;

p) CAN/CSA B659-– Inclusive Design for an Aging Population

q) CAN/CSA-C2, Single-Phase and Three-Phase Distribution Transformers, Types ONAN and LNAN

r) CSA C9 – Dry Type Transformers;

s) CAN/CSA C22.1 & C22.2 Canadian Electrical Code as adopted in British Columbia;

t) CSA C22.3 – No. 1, Overhead Systems;

u) CSA/CAN3-C235, Preferred Voltage Levels for AC Systems, 0 to 50,000 V.

v) CSA C282 – Emergency Electrical Power Supply for Buildings

w) CSA S16 – Design of Steel Structures;

x) CSA S136 – Design of Cold Formed Steel Members;

y) CSA S157 – Strength Design in Aluminum;

z) CSA S304.1 – Masonry Design for Buildings;

aa) CSA S413 – Parking Structures;

bb) CSA S478 – Guideline on Durability of Buildings;

cc) CSA S524 – Standards for the Installation of Fire Alarm Systems;

dd) CSA S537 – Standards for Verification of Fire Alarm Systems;

ee) CSA S832 – Guidelines for Seismic Risk Reduction of Operational and Functional Components of Buildings;

ff) CSA T568.1 and T568.2 – Commercial Building Telecommunications Cabling Standard – Parts 1 & 2;

gg) CSA T530 – Commercial Building Standard for Telecommunications Pathways and Spaces;

hh) CAN/CSA T528 – Administration Standard for Telecommunications Infrastructure of Commercial Buildings; and

CSA T527 – Commercial Grounding and Bonding Requirements for Telecommunications;

jj) CAN/CSA Z8001 – Commissioning of Health Care Facilities

kk) CAN/CSA Z10535.2 – Lifts for the transfer of persons- installation, use and maintenance

ll) CSA Z432 – Safeguarding and Machinery

mm) CSA Z317.1 – Special Requirements for Plumbing Installations in Health Care Facilities

nn) CSA Z317.2 - Special Requirements for Heating, Ventilation, and Air-Conditioning (HVAC) Systems in Health Care Facilities

oo) CSA Z317.14 - Wayfinding for Health Care Facilities

pp) CSA W186– Welding of Reinforcing Bars in Reinforced Concrete; Construction

qq) CSA Z32 – Electrical Safety and Essential Electrical System in Health Care Facilities

rr) CSA Z314.7 – Steam Sterilizers for Health Care Facilities;

ss) CSA Z314.3 – Effective Sterilization in Health Care Settings by the Steam Process;

tt) CSA Z314.8 – Handling of Waste Materials in Health Care Facilities and Veterinary Health Care Facilities;

uu) CSA Z314.8 – Decontamination of Reusable Medical Devices;

vv) CSA Z314-18 – Canadian Medical Device Reprocessing;

ww) CSA Z314.23 – Chemical Sterilization of Reusable Medical Devices;

xx) CSA Z317.2 – Specials Requirements for Heating, Ventilation, and Air-Conditioning (HVAC) Systems in Health Care Facilities;

yy) CSA Z317.2 – Special Requirements for Plumbing Installations in Health Care Facilities;

zz) CSA Z317.5 – Illumination Systems in Health Care Facilities;

aaa) CSA Z317.10 – Handling of Waste

bbb) CSA Z317.11 – Area Requirements for Health Care Facilities;

ccc) CSAZ317.12- Cleaning and Disinfection of Health Care Facilities;

ddd) CSA Z317.13 – Infection Control During Construction, Renovation, and Maintenance of Health Care Facilities;

eee) CSA Z318.0 – Commissioning of Health Care Facilities;

fff) CSA Z318.1 – Commissioning of HVAC Systems in Health Care Facilities;

ggg) CSA Z318.5 – Commissioning of Electrical Equipment and Systems in Health Care Facilities;

hhh) CSA Z386 – Safe Use of Lasers in Health Care;

CSA Z412-17 Office Ergonomics;

jjj) CSA Z462 – Workplace Electrical Safety;

kkk) CSA Z7396.1: Medical Gas Pipeline Systems – Part 1;

lll) CSA Z8000 – Canadian health care facilities;

mmm) CSA Z 8001 – Commissioning of Health Care Facilities;

nnn) CSA Z9170-1: Terminal Units for Medical Gas Pipeline Systems – Part 1; and

ooo) CSA Z614-2020: Children's Playground Equipment and Surfacing.

.26 CTI (Cooling Tower Institute) Standard STD-201.

.27 ECABC Seismic Restraint Standards Manual

.28 EXPO6 Evaluating emerging materials and technologies for infection prevention

.29 Fire Underwriter Survey – Water Supply for Public Fire Protection

.30 FGI Guidelines for Design and Construction of Health Care Facilities (Electrical, Security, Lighting, Communication reference section)

.31 Government of Canada's publication, Canadian Biosafety Standard

.32 ICAO / Annex 14, Volume II

.33 ICUN Red List of Threatened Species

.34 IEEE:

IEEE 802.1 series for Interworking, Security, Audio/Video Bridging and Data Centre Bridging;

IEEE 802.3 series of Ethernet Standards;

c) IEEE 802.11 series of Wireless Standards;

d) IEEE 519- Harmonic Limits; and

IEEE C2 National Electrical Safety Code.

.35 IEEE C57.19.91, IEEE Standard test code for dry-type distribution and power transformers;

.36 Island Health Ergonomic Standard for Computer Workstation Furniture and Set Up version 2.0;

.37 Island Health Interior Signage Guide Island Health Facilities;

.38 Illuminating Engineering Society of North America Lighting Handbook - Reference & Application;

.39 ISO 14090 Adaption to Climate Change – Principles, requirements and guidelines;

.40 Master Floor Covering Standards Institute;

.41 Master Painters Institute Architectural Specification Standards Manual;

.42 Master Municipal Construction Document (MMCD) and MMCD supplemental specifications, as authored or adopted by the applicable municipal authorities having jurisdiction;

.43 Ministry of Health — Province of British Columbia Provincial Quality, Health & Safety Standards and Guidelines for Secure Rooms in Designated Mental Health Facilities under the B.C. Mental Health Act.

.44 Ministry of Transportation and Infrastructure (MoTI) Standard Specifications for Highway Construction (latest edition);

.45 Municipality of North Cowichan (MNC) Engineering Standards

.46 Municipality of North Cowichan Bell McKinnon Local Area Plan

.47 NAPRA - National Association of Pharmacy Regulatory Authorities (NAPRA) Model and Guidance Standards for Non-Sterile Preparations, Non-Hazardous Sterile Preparations and Hazardous Sterile Preparations.

.48 NCRP&M -National Council on Radiation Protection and Measurement:

Report #147 Structural Shielding Design for Medical X-Ray Imaging Facilities;

NCRP #151 Structural Shielding Design and Evaluation for Megavoltage X and Gamma-Ray Radiotherapy Facilities;

NCRP #49, #33, #35 Structural Shielding Design and Evaluation for medical use of X-rays and Gamma Rays;

.49 NEMA PB2.2, Application Guide for Ground Fault Protection Devices for Equipment.

NFPA 20, Stationary Fire Pumps for Fire Protection

.50 NEMA WC7 ICEA S 66 524, Cross Linked Polyethylene Wire and Cable for Transmission and Distribution.

.51 NEMA VE 1, Metal Cable Tray Systems

.52 NETA

ATS International Electrical Testing Association (Acceptance Testing Specifications); and

b) MTS Standards for Maintenance Testing;

UL 1069 Hospital Signaling and Nurse Call Equipment.

.53 New York State Office of Mental Health, Patient Safety Standards– Materials and Systems Guidelines;

.54 NFPA (National Fire Protection Association)

NFPA 10 – Standard for Portable Fire Extinguishers;

b) NFPA 13 – Standard for Installation of Sprinkler Systems;

NFPA 14 – Standard for Installation of Standpipe and Hose Systems;

NFPA 17 – Standard for Dry-Chemical Extinguishing Systems;

NFPA 20 –Standard for the Installation of Stationary Pumps for Fire Protection;

NFPA 25 –Standard for the Inspection, Testing and Maintenance of Water Based Fire Protection;

g) NFPA 30 –Flammable and Combustible Liquids Code;

h) NFPA 55 –Compressed Gases and Cryogenic Fluids Code;

i) NFPA 56F – Non-flammable Medical Gas System;

NFPA 70 –National Electrical Code;

NFPA 70B –Recommended Practice for Electrical Equipment Maintenance;

l) NFPA 90A –Standard for Installation of Air Conditioning and Ventilation Systems;

m) NFPA 92A –Standard for Smoke Control Systems Utilizing Barriers and Pressure Differences;

NFPA 96 –Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations;

o) NFPA 99 –Heath Care Facilities Code;

p) NFPA 101 –Life Safety Code;

q) NFPA 214 –Standard on Water-Cooling Towers;

r) NFPA 701 – Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.

.55 ORNAC- Operating Room Nurses Association of Canada

.56 PiCNet- Provincial Infection Control Network of British Columbia

.57 Sheet Metal and Air Conditioning Contractors National Association Inc. (SMACNA) Manuals;

.58 S832 (R2011) – Seismic Risk Reduction of Operational and Functional Components (OFCS of Buildings);

.59 Stormwater Planning: A Guidebook for British Columbia;

.60 Sustainability:

Energy, GHG Emissions & Climate Change Adaption:

Advanced ENERGY Guide for Hospitals and Healthcare Facilities;

ASHRAE Guideline 0- – The Commissioning Process;

ASHRAE Guideline 1.1- – HVAC & R Technical Requirements for the Commissioning process;

ASHRAE Guideline 1.4- Procedures for Preparing Facility Systems Manuals;

ASHRAE Guideline 14- Measurement of Energy Demand and Water Savings;

vi) ASHRAE Guideline 22 – Instrumentation for Monitoring Central Chilled Water Plant Efficiency;

ASHRAE Guideline 36 – High Performance Sequences of Operation for HVAC Systems;

ASHRAE 1Guideline 70 Ventilation of Health Care Facilities;

ASHRAE Guideline 110-: Method of Testing Performance of laboratory Fume Hoods;

ASHRAE Guideline 202 – Commissioning Process for Buildings and Systems;

xi) ASHRAE Green Healthcare Construction Guidance Statement;

ASHRAE Standard 147;

xiii) ASHRAE Standard 189.1- Standard for the Design of High-Performance Green Buildings;

xiv) ASHRAE Standard 189.3– Design, Construction, and Operation of Sustainable High-Performance Health Care Facilities;

xv) ASHRAE System Design Manual for Hospitals and Clinics;

xvi) BC Energy Step Code;

xvii) BC Hydro High-Performance Building Program;

xviii) BOMA (Building Owner Authority and Managers Association) Go Green Program;

xix) Building Materials for the Environmentally Hypersensitive, CMHC;

xx) Canadian Building Green Hospitals Checklist - Canadian Coalition for Green Health Care; Plus climate Standards climate models;

xxi) CAN/ULC-S101, Standard Methods of Fire Endurance Tests of Building Construction and Materials;

xxii) City of Vancouver – Energy Modelling Guidelines Version 2;

xxiii) CleanBC Commercial New Construction Program Energy Modelling Guidelines;

xxiv) Climate Change Action Plan -EGBC;

xxv) Climate Resilience Guidelines for B.C. Health Facility Planning & Design V 1.1;

xxvi) Climate Resilience and Well-being Through Neighbourhood-scale Green Design- A Better Practice Guide;

xxvii) Establishing Design Conditions for Climate Resistant Planning & Design of Health Facilities in British Columbia v 1;

xxviii) Fortis BC Participant Guide - Commercial New Construction Performance Program;

xxix) Green Globes – Environment Assessment for New Buildings;

xxx) Healthy Built Environment (HBE) Linkages Toolkit;

xxxi) IES The Lighting Handbook

xxxii) Joint Professional Practice Guidelines Whole Building Energy Modelling Services – EGBC & AIBC;

xxxiii) LEED Reference Guide for BD+C Vol 4 and LEED BD+C Vol 4.1;

xxxiv) Green Building Design and Construction: Healthcare Supplement with Global ACPs;

xxxv) Natural Resources Canada Energy Innovators Initiative;

xxxvi) Public Guideline: Principles of Climate Adaptation and Mitigation for Engineers- Engineers Canada;

xxxvii) Sustainability- APEGBC Professional Practice Guidelines V1.1;

xxxviii) Sustainable Health Care Architecture –by Robin Guenther and Gail Vittori;

xxxix) Terrazzo Tile and Marble Association of Canada;

xl) The Green Guide for Health Care CaGBC;

xli) Underwriters Laboratories of Canada (ULC); and

xlii) United States Green Building Council – LEED V4 BD+C: HC.

.61 University of British Columbia Faculty of Medicine:

Specifications and Requirements for Clinical Education Facilities

Design Guidelines and Functional Requirements for Learning Spaces: Small Seminar Rooms;

Design Guidelines and Functional Requirements for Learning Spaces: Clinical Skills and Enhanced Clinical Skills Rooms; and

Design Guidelines and Functional Requirements for Learning Spaces: On Call Suite.

e) USP 797 Guidebooks to Pharmaceutical Compounding – Sterile Preparations

.62 USP General Chapter 800 Hazardous Drug Handling in Healthcare Settings

.63 WorkSafe BC Regulations and Guidelines, including the following:

a) Illumination

Part 4, General Conditions, Section 4.64 – 4.69.

HVAC

i) Part 4, General Conditions, Indoor Air Quality, Sections 4.70 – 4.80;

Part 4, General Conditions, Environmental Tobacco Smoke, Sections 4.81 – 4.82;

Part 5, Flammable and Combustible Substances, Section 5.35;

Part 5, Controlling Exposure, Section .56;

Part 5, Ventilation, Sections 5.60-5.71; and

Part 30, General Requirements, Sections 30.4, 30.5, 30.7, 30.8- 30.12

c) Ergonomics

Part 4, General Conditions, Ergonomics (MSI) Requirements, Sections 4.46 – 4.53; and

Guidelines Part 4 – Ergonomics (MSI) Requirements Update 2006, G4.46 – 4.53(2).

Emergency Eyewash / Showers

Part 5, Chemical Agents and Biological Agents, Definitions, Section 5.1;

Part 5, Chemical Agents and Biological Agents, Emergency Washing Facilities, Sections 5.85 – 5.96;

Guidelines Part 5, Emergency Washing Facilities; and

Guidelines Part 30, General Requirements, Plumbing, G30.4.

e) Fall Protection

Part 4, General Conditions, Work Areas Guards and handrails, Sections 4.54 – 4.63;

ii) Part 11, Fall Protection, Section G11.1 – G11.10(0.1).

Emergency Response

Part 4, General Conditions, Emergency Preparedness and Response, 4.13 – 4.18.

g) Eating Areas / Washrooms / Change Areas / Unsafe Water

Part 4, General Conditions, Occupational Environment Requirements, Section 4.84 – 4.87.

h) Electrical Safety

Part 4, General Conditions, Buildings, Structures, Equipment and Site Conditions, Conformity to Standards, Section 4.4; and

Part 19, Electrical Safety, Sections 19.1 – 19.9.

Radiation Safety

Division 3 Radiation Exposure (included ionizing and non- ionizing radiation) Section 7.18 – 7.24 Guidelines Part 7 – Division 3 Radiation Exposure G7.18 – G7.19 (4)-2;

BCICA Quality Standards Manual for Mechanical Insulation;

TIAC (Thermal Insulation Association of Canada) Standards;

Canadian Council on Health Services Accreditation Program, Latest Edition;

Ministry of Health — Province of British Columbia Provincial Quality, Health & Safety Standards and Guidelines for Secure Rooms in Designated Mental Health Facilities under the B.C. Mental Health Act; and

Health Canada Safety Code 35: Safety Procedures for the Installation, Use and Control of X-ray Equipment in Large Medical Radiological Facilities.

.64 Transportation Association of Canada

Geometric Design Guide (2019 Revisions); and

b) Canadian Roundabout Design Guide (2017).

2.3.3 CSA Z8000: Canadian Health Care Facilities

CSA Z8000 complements the Standards and codes specified in Schedule 2 by providing overarching Design Principles and referencing specific Standards and codes that are appropriate for healthcare Facility Design.

The Participants will:

refer to CSA Z8000 for Design guidance to resolve issues not otherwise addressed in Schedule 2; and

b) comply with:

any minimum Standards and codes referenced in CSA Z8000;

with the space requirements as listed in Appendix 2A - Clinical Specifications Schedule of Accommodations where there is a conflict with CSA Z8000;

iii) all infection control provisions set out in CSA Z8000; and

Section 7.8.8 (Accommodation of Bariatric Persons) set out in CSA Z8000; and

Standards where directed by Schedule 2.

2.3.4 The Participants will comply with CSA Z317.13: Infection Control during Construction, Renovation or Maintenance of Health Care Facilities.

2.3.5 CSA Z317.13 complements the Standards and codes specified in Schedule 2 by providing overarching Design Principles and referencing specific Standards and codes that are appropriate for healthcare Facility Design.

.1 The Participants will:

refer to CSA Z317.13 for guidance to resolve issues not otherwise addressed in Schedule 2; and

comply with:

i) any minimum Standards and codes referenced in CSA Z317.13: and

all infection control provisions set out in CSA Z317.13.

2.3.6 Heliport Standards and Codes

The Heliport mechanical and electrical systems, structural, material, Construction, airspace, dimensions, Design and documentation shall conform to the latest version of all applicable codes, Standards, regulations and guidelines. The codes, Standards, regulations and guidelines shall include, but not be limited to the following:

Transport Canada – CAR (Canadian Aviation Regulations)

Part III Subpart 5

Part VI Subpart 1

Standard 325

Standard 621

Aerodrome Standards and Recommended Practices (TP312) 5th Edition

Transport Canada – AC (Advisory Circulars) and SI (Staff Instructions)

AC 305-001: Standards Associated with H1 Classified Heliports

AC 305-002: Rooftop Heliport Firefighting Protection

SI 305-001: Aerial Assessment Requirements Prior to Heliport Certification

c) ICAO (International Civil Aviation Organization) Annex 14 Volume II Heliport

d) FAA (Federal Aviation Administration) Specifications for Runway and Taxiway Light Fixtures Advisory Circular (AC) 150/5345-46

NFPA (National Fire Protection Association)

11: Standard for Low-, Medium-, and High-Expansion Foam;

13: Standard for Installation of Sprinkler Systems;

16: Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems;

25: Standard for the Inspection, Testing and Maintenance of Water Based Fire Protection;

30: Flammable and Combustible Liquids Code;

72: National Fire Alarm Code;

99: Health Care Facilities Code;

412: Standard for Evaluating Aircraft Rescue and Firefighting Foam Equipment;

418: Standard for Heliports.

Nav Canada

Aeronautical Information Management Proponent Education Package: Land Use Proposal Guidelines

NOTAM Procedures Manual

ASTM (American Society for Testing and Materials)

ASTM E136-16a – Standard Test Method for Behaviour of Materials in a Vertical Tube Furnace at 750°C.

ASTM E2652-18 – Standard Test Method for Behaviour of Materials in a Vertical Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750°C

h) National Building Code of Canada

i) National Fire Code of Canada

j) CAN/ULC-S560-06 – Category 3 Aqueous Film-Forming Foam (AFFF) Liquid Concentrates

British Columbia Fire Code

l) ICES-005-07, Radio Frequency Lighting Devices

Canadian Standards Association (CSA International)

n) Underwriters' Laboratories of Canada (ULC)

2.4 Use of Wood

2.4.1 The *Wood First Act* (British Columbia) will advise structural and finish material selections and give priority to the use of wood and wood products where this can be done consistent with the overall Design intent, functional and performance criteria.

2.4.2 The use of wood will be in accordance with Appendix 2B Wood First Appropriate Use Matrix.

2.4.3 Opportunities to integrate emerging wood technologies into the Facility Design, such as secondary or feature Building framing, are encouraged.

2.5 Not Used

2.5.1 Not Used

2.5.2 Not Used

2.6 Clinical Specifications

2.6.1 Clinical Specifications for the new Facility are set out in Appendix 2A Clinical Specifications. The Schedule of Accommodations elements of Appendix 2A will be updated and revised during the development of the schematic design by the Participants to create an Architectural Schedule of Accommodations. The ALT will approve the revised Architectural Schedule of Accommodations. After approval by the

ALT, the revised Architectural Schedule of Accommodations will replace the existing Schedule of Accommodations in Appendix 2A for all purposes.

2.6.2 The Participants will Design and Construct the new Facility:

so that it accommodates all of the spaces, activities, functions, Design features and adjacencies described in this Schedule 2; and

in accordance with the requirements of the applicable Appendix 2A Clinical Specifications, subject to any adjustments or refinements made in accordance with the Participants during the course of the Project.

2.7 Rooms and Spaces

2.7.1 Notwithstanding anything in the Appendix 2A Clinical Specifications, the Participants will Design and Construct the Facility to include all rooms and spaces as required to comply with the terms of Project Alliance Agreement, including sufficient rooms and spaces as necessary for the operation and maintenance of the Facility.

2.8 UBC Faculty of Medicine Design Guidelines and Functional Requirements

2.8.1 In addition to the requirements of Schedule2, the Participants will Design and construct OS-GP-04 UBC Facilities component rooms to meet the requirements of Appendix 2F UBC Faculty of Medicine Design Guidelines and Functional Requirements. UBC references to Project Co to be read as reference to Participants and Project Agreement as the Project Alliance Agreement.

2.8.2 The following rooms are to meet the requirements in Appendix 2F:

Meeting/Videoconference Rooms (2);

.2 Enhanced Clinical Skills Room (2);

Control Room (1);

.4 On-Call Suite – Trainee (1);

.5 On-Call Suite – Trainee-Accessible (1);

.6 Locker Area;

.7 Toilet -Staff;

.8 Shower Stall;

.9 Alcove- Clean Linen (Sgle);

.10 Alcove- Soiled Linen Toter;

.11 Lounge; and

.12 Toilet-Staff (Learner).

2.8.3 Refer also to Appendix 2A Clinical Specifications for additional information regarding OS-GP-04 UBC Facilities for Faculty of Medicine spaces to be included in the Building .

2.8.4 If there is a conflict between a provision of Appendix 2F UBC Faculty Of Medicine Design Guidelines and Functional Requirements and a provision of Schedule 2 or Appendix 2A, the provisions of Appendix 2F UBC Faculty of Medicine Design Guidelines and Functional Requirements will govern.

2.9 Service Centre

2.9.1 The Participants will:

Provide a Service Centre that contains the head end mechanical, and electrical services for the Facility. Refer to mechanical, and electrical performance specifications in Section 7.

Provide space for the service equipment which includes spare capacity identified in Section 7.

Provide and identify future expansion space for future mechanical and electrical plant services.

Provide space with sufficient height to safely access, service and replace equipment, including service mezzanines and access stairs.

Provide vertical access all levels in the Service Centre including the mezzanine to lift and carry equipment for maintenance and replacement.

.6 Provide overhead rolling door to the exterior Loading Dock area sized as required for installation, removal, repairs and maintenance to Service Centre equipment. Provide man door to exterior.

3 DESIGN PRINCIPLES

3.1 Project Design Principles

3.1.1 The Participants will apply the Project Design Principles described in Part 3 and in the relevant engineering sections of this Schedule 2, as well as, Appendix 2C Design Guidelines (collectively, the "Project Design Principles") in undertaking the Design;

3.1.2 The Project Design Principles are integrated principles and the Participants will apply them on an interdisciplinary basis throughout the Design and Construction;

3.1.3 The Participants will Design the Facility to have a strong civic presence and a distinctive regional architectural character, reflecting the Owner's values and role as the major center for health care in the community;

3.1.4 The Participants will Design the Facility to create a cohesive thematic Design solution which integrates the Site, exterior Building mass, facades, interior environment and wayfinding, through an integrated Design approach;

3.1.5 The Participants will incorporate visible representation of First Nations, Metis and Indigenous peoples and culture into the Design of the Building and Site;

3.1.6 The Participants will Design the Facility to support community access by including:

a main entry and lobby for the Building oriented to the major parking lots and visible from Hospital Road North and Hospital Road South;

a direct access route to the Emergency Department drop off, parking and entrance for public;

c) an entry to access community support resources and patient transfer; and

separate service delivery loading areas.

3.1.7 Provide efficient and effective operational planning throughout the Building and Facility;

3.1.8 Provide logical, clear and direct circulation routes within the Building; and on the Site, separating public and service, vehicular, and pedestrian traffic flows;

3.1.9 Provide a separate ambulance entry and exit from the Site and a clear, direct, dedicated and unimpeded access to the sheltered ambulance bays and parking spaces; and

3.1.10 Provide for a Heliport that can be certified.

3.2 Master Planning and Future Growth Requirements

3.2.1 The Participants will allow for adaptability and flexibility for change within the Building and provide for cost effective and ease of future expansion, not only for the Building, but also for expansion on the Site.

3.2.2 The Participants will develop a Master Plan to illustrate a minimum of 3 phases of Facility expansion consisting of:

Phase 1: the new CDHRP and a Child Care Centre footprint outlined on the Site Master Plan;

.2 Phase 2: addition of a second IPU Tower and expansion/addition of the D&T Block as well as any expansion required to the Service Centre; and

Phase 3: development of additional Building Sites for hospital use or third party functions.

3.2.3 The Master Plan phases will respect the infrastructure investment developed in the previous phases and will add to rather than demolish and replace.

3.2.4 Proposed additions to Buildings will be possible to construct without major interference to Building operations during Construction.

3.2.5 Potential parkade Construction is anticipated to occur in Phase 3.

3.2.6 In all phases landscaped zones will be identified and protected.

3.2.7 A Child Care Centre footprint will be located on the Site Master Plan to allow for:

Area of 750 gross square metres for a stand alone building of one or two stories;

Safe child pick up and drop off zone;

Access to the drop off zone;

.4 Secure outdoor play area of 350m2;

.5 Site utilities extended to the Site for future Child Care Centre;

.6 2 stalls allocated to Child Care staff parking allocated from existing 800 parking stall count; and

.7 Reallocation of parking stalls impacted by the footprint of the Child Care Centre by the Owner.

3.3 Universal Design Philosophies

3.3.1 Evidence Informed and Quality Driven Design

The Participants will apply evidence informed and quality driven Design methodologies in undertaking the Design. Decisions about the Design of the Building will be based on credible research, information derived from comparable Projects, and information about the Owner's operations, in order to achieve the best possible outcomes.

.2 The goal of evidence informed and quality driven Design is to deliver measurable improvements for the Building and Site Design through use of the Owner's patient and workflow outcomes, productivity, economic performance, and customer satisfaction research.

The Participants will cooperate with and provide information for the Owner's research into Design impacts on healthcare operations and/or treatment in the Facility.

3.3.2 Healing and Wellness Design Philosophy

The Participants will Design the Facility to promote a healing and wellness environment for patients, their families, physicians, staff and the community. The environment will be welcoming for a community of users of all ages, genders and abilities. It will provide non-clinical spaces to relax, de-stress and distract, as well as, clinical spaces that include elements to distract attention where appropriate.

.2 In order to promote and enhance patient and family centered care the Design of the Facility will:

provide an environment that supports excellence and innovation in the delivery of accessible, safe, and high-quality healthcare for all users. Employees, physicians and others must work together collaboratively in promoting health and wellness in an environment that supports integration and multidisciplinary care;

include elements that have been evidence informed to create a therapeutic and low stress environment, such as:

maximize acoustic separation from noise;

maximize access to natural light while providing light control;

maximize connection to the outdoors through views of the exterior environment in all inpatient rooms, meeting rooms, and staff lounges;

iv) maximize family interaction through providing spaces and furniture for family to be present in patient areas;

apply colour, pattern, art works and feature elements to enhance wayfinding throughout the Facility and create alternative distractions for patients in high stress areas; and

include Designed locations for art and aesthetic forms that reflect First Nations, Metis and Indigenous peoples history, community history and accommodate the work of local artists.

Access to windows for views to the outside world and to natural vegetation and light is a known evidence informed contributor to creating a healing and wellness environment. Where appropriate place windows to access views of the surrounding natural area.

.4 Design the Building:

To maintain existing natural features Site views and to create new views through the use of view corridors, the terracing of Building forms and the creation of appropriate public spaces;

To utilize "near views" of public spaces, natural and landscaped areas on - Site and

off-Site as well as Site specific views such as views of adjacent natural and park settings;

To utilize views to the traditional and culturally meaningful landforms; and

To minimize negative visuals such as, high traffic or loading and service zones.

3.3.3 Elderly Friendly

The Participants will Design the Facility to create an elderly friendly environment. The Participants will reference "Code Plus: Physical Design Components for an Elder Friendly Hospital", which identifies components that are known to contribute adverse effects on functional ability and safety in older adults and recommends alternative solutions, and apply as appropriate.

The Participants will Design all the General Medical/Surgical Inpatient Units in the Building so that they are appropriate for patients with dementia.

3.3.4 Accessible Design

The Participants will incorporate the following philosophies in the Design to address barriers to equitable access to healthcare such as cultural diversity, physical capability and gender.

.2 The Participants will Design to the requirements of CSA B651 and applicable Building Code requirements for accessibility.

Equitable use – the Design will be easy to use by people with diverse abilities and include assistance devices for people who are hearing impaired or who have other diverse abilities.

.4 Flexibility in use – the Design will accommodate a wide range of individual preferences and abilities.

Simple and intuitive – the Design will be easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

.6 Perceptible information – the Design will communicate necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

.7 Low physical effort – the Design is capable of being used efficiently and comfortably and with a minimum of fatigue.

.8 Size and space for approach and use – the Design will use provide appropriate size and space for approach, reach, manipulation, and use regardless of user's body size, posture or mobility.

3.3.5 Respect for First Nations, Metis and Indigenous Cultural Values

The Participants will demonstrate respect for First Nations, Metis and Indigenous cultural values represented by Indigenous groups of Vancouver Island British Columbia and the Cowichan Valley throughout the development and Design of the Facility.

The Participants will consult with the Advisory Council, Elders, and knowledge holders to identify and implement specific Design requirements throughout the Design process.

Site landscaping will incorporate cultural elements such as Indigenous plants, house poles and/or Welcome Figures. Refer to Appendix 2O Recommended Plant List for a listing of Indigenous plants.

Interior programmatic spaces will be sized and placed appropriately to allow for cultural activities both inside the Building and on the exterior.

The Gathering/Sacred Space will allow for direct eastern light to access the space and have direct access into a courtyard.

.6 Language and names on major exterior and interior signage will reflect the local culture and be translated into local languages as appropriate. Languages to be represented in addition to English include Indigenous languages providing for significant application of the Hul-qumi'num language with acknowledgement of other Indigenous languages as determined by the Indigenous Advisory Council.

.7 The Participants will provide Indigenous Design features reflecting and representing the Indigenous groups of Vancouver Island British Columbia and the surrounding Cowichan Valley in the following functional component areas:

a) Public (patient and visitor) Support Services;

b) General Medical/Surgical Inpatient Units;

Perinatal and Pediatric Inpatient Unit;

Emergency Department (ED);

Restorative Health Acute & Ambulatory Care Therapy Services;

Perioperative Services (including Ambulatory Procedures);

g) Medical Imaging; and

h) Indigenous Health, Spiritual Health, Social Work, Liaison Nursing.

The Participants will provide territorial acknowledgement walls acknowledging the placement of the Facility on traditional lands. The walls will be prominently displayed. Refer to Section 5.11.

.9 The Participants will provide and erect "Welcome Figures" on the Site in locations agreed to by the ALT.

3.3.6 Reference to Local History and Heritage

The Participants will Design the Facilities:

in a manner that demonstrates respect for the local history and heritage of the Cowichan Valley, as applicable; and

b) to include Design elements and display opportunities that will identify, reinforce and educate visitors to the Facility of the unique history and heritage of the Cowichan Valley, as applicable.

3.3.7 Standardization

The Participants will Design the Facility:

To apply standardization of Design and planning in order to reduce clinical errors and improve quality of service delivery. Refer to Appendix 2A Clinical Specifications for list of standardized rooms;

Inpatient rooms and patient treatment modules should maintain standard room Design and room details, including equipment and services layout and location; and

Typical rooms in the Building that have the same function (for example, medication rooms) will be Designed and constructed to be as similar as possible,

subject to any different requirements set out in Appendix 2A Clinical Specifications.

3.4 Sustainability and Resilience

3.4.1 LEED v4 Building Design + Construction: Healthcare, Gold Certification

The Project has been registered by the Owner for LEED Gold Certification.

.2 Participants will document, and submit for LEED Gold certification within 3 months of move in.

.3 Consideration from the Energy and Emissions Report (available in data room) as minimum requirements for the building's energy consumption and GHG emissions targets.

3.4.2 Environmental Impact Mitigation and Operational Sustainability

The Participants will Design the Building and Site using Design methods, operational practices, and full life cycle considerations for selection of Building materials and energy systems that will minimize environmental impact and contribute to operational sustainability.

In doing so the Design of the Building will contribute to promoting environmental quality, social benefits, protection of health and indoor environmental quality, and economic vitality throughout the Construction and operating periods.

In particular, the Facility will be Designed:

to take advantage of efficiencies and innovations that may be possible through integration of systems to minimize operational costs for the Owner (for example in relation to utilities and carbon taxes);

to minimize GHG emissions by providing alternative low-carbon sources of energy, for example, maximizing opportunities for recovering waste heat to offset natural gas;

to apply a total systems Design approach to minimize energy consumption and greenhouse gas emissions and incorporate energy management information systems and techniques that stabilize and minimize energy flows and consumption;

to use Design and Construction methods to minimise potable water consumption and impact to natural water sources through stormwater management and avoidance of run-off;

to select materials to minimise embodied GHG emissions and protect health and indoor environmental quality;

f) to maximise biodiverse species and pollinator habitats especially those on the IUCN Red List within the Site;

to monitor and maintain indoor air quality to provide optimal health, safety and well being for the occupants;

h) to maximize the diversion of Construction waste to landfill, avoid use of chemicals of high concern (VOCs, phthalates, formaldehyde) and provide synergistic means to reduce operational waste;

to incorporate nature into the Site and provide access to nature both outdoors and through views to the outdoors. Provide quiet spaces, areas of respite and places to move; and

to provide infrastructure to support clean and active transportation.

3.4.3 Climate Adaptation and Resiliency Requirements

The Participants will Design the Building and Site as follows:

Base the Design on future climate parameters. The climate Design criteria provided in the British Columbia Building Code, ASHRAE or other traditional sources is based on historical information and will not be accepted as sufficient to Design the Facility for future climate;

b) Utilize climate Projection models based on RCP 8.5 2050 and 2080 for all Design or systems that rely on climatic data.

c) At a minimum, the climatic data is for Designing energy systems, maintenance plans, water systems, storm systems, landscapes and structures as well as for any other system impacted by climate;

Include adaptive strategies providing flexibility so that the Project deliverables will be adapted for the climate at Substantial Completion and throughout the life cycle of the infrastructure;

For infrastructure that will last for 50 years (example Building envelope, Site storm drains, ductwork) Design for the climate that will occur in 50 years from opening day;

f) For infrastructure that is replaced in 20 years, Design for climate that will occur within the 20 years from opening day and provide adequate space and flexibility so that the replacement system will be suitable for the climate out to end of life of the Facility;

Use the results and outputs from the Preliminary Climate Risk Assessment document in the Data Room to inform the Design and to conduct a climate risk assessment of Site, Building and Building systems; and

h) Identify any information gaps via a workshop during Design development. The workshop will allow the Participants to demonstrate responses to addressing climate change and will be a collaborative meeting with the Participants. The output from the workshop will illustrate how Design considerations address medium-high and high risks at opening day, half-life and end of life to lower the risk scores; document residual risk and describe assumptions including risk thresholds.

Refer to Risk Assessment and Compliance Audit requirements such as PIEVC, Climate Lens and ISO 14090 to inform the Design.

3.5 Optimized Outcomes and LEAN Design

3.5.1 The Participants will Design the Facility:

to facilitate the delivery of efficient and effective workflow and processes;

to eliminate waste, within both clinical and non-clinical service delivery processes;

.3 to recognize the value to the Owner of LEAN healthcare (or equivalent methodologies) in supporting the delivery of Owner activities, and accordingly allow the findings from such methodologies to play a key role in influencing Design decisions;

.4 to include ergonomic Design features throughout all spaces that specifically facilitate the physical activities of staff and patients, including, for example, appropriate

millwork, lighting, lift devices, and patient assist or equipment maneuvering space; and

to support innovative and collaborative methods of working, to help incorporate the Owner's new and emerging technologies, to respond to diverse work styles (such as shared workstations and job-sharing), and to optimize flexibility and space utilization.

3.5.2 A key element to the development of an integrated workplace is the provision of physical environments that support varied workplace strategies. Accordingly, the Participants will Design workplaces to:

.1 include standardized spaces, systems furniture and casework where appropriate;

.2 provide floor lay-outs that accommodate teams as well as individuals, and that support mobile employees who require flexibility and use portable technology; and

consider co-location options, space saving strategies, and lay-outs and furniture that facilitate change.

3.6 Adaptability and Flexibility

3.6.1 The Participants will Design the Facility:

to meet the needs of the community now and to anticipate Design and planning elements that will allow for adaptation into the future;

to accommodate the rapid cycle of innovation and change to support development and implementation of new clinical and non-clinical work processes and technology changes and upgrades; and

to accommodate program, service, work and equipment change with minimized utility infrastructure and Facility impact, including down time, and so that clinical areas are acuity adaptable.

3.6.2 The Participants will Design the Facility:

to support future expansion of components, and capacity as a whole, including planning zones for growth;

to optimize functionality within a given floor area, and multi-use adaptable space;

.3 to incorporate infrastructure that includes systems and components that support future expansion with minimized disruption; and

.4 to utilize planning in placing areas such as office areas to create soft zones responsive to rapid change and growth for adjacent components with expected growth requirements and potential.

3.7 Infection Prevention and Control

3.7.1 General

The Participants will Design the Facility to be safe for all occupants in terms of both prevention of health care associated infections and the control of infectious diseases within the built environment.

.2 Notwithstanding Section 2.3, Design the Building in compliance with all applicable infection control Standards including:

CSAZ8000 Canadian Health Care Facilities;

CSA Z317.13 – Infection Control During Construction, Renovation and Maintenance of Health Care Facilities;

CSA Z317.2 – Special requirements for heating, ventilation and air conditioning (HVAC) systems in healthcare facilities;

CSA Z317.1 – Special requirements for plumbing installations in healthcare facilities;

CSA Z314 – Canadian medical device reprocessing; and

CSA Z317.12 – Cleaning and Disinfection of Healthcare Facilities.

Design the Building to mitigate and prevent, where possible, the spread of infection, movement of dust, debris and moisture into rooms including via contaminated surfaces, through air or water.

.4 Select appropriate materials and use simple detailing leading to quality Construction workmanship and ease of accessibility for routine cleaning and maintenance.

.5 Manufacturers' cleaning protocols will be compatible with the Owner's products including those containing accelerated hydrogen peroxide bleach, alcohol and quaternary ammonia.

.6 Design the Building to allow for infection prevention and control Standards to align with IPAC best practice Standards and to allow appropriate Standards to be maintained during future alterations, modifications and additions.

The Participants will demonstrate the Design, the materials selected and the proposed Construction of the Facility aligns with IPAC best practice and meets appropriate Standards prior to installation and Construction.

3.7.2 Infection Control for Ceilings

Ceilings will limit the passage of particles from both above the ceiling plane and adjacent non-clinical areas into the clinical environment.

.2 Ceilings in areas with moisture build up will be monolithic and constructed of solid surfacing materials or drywall as a seamless and unbroken surface. Service access panels where permitted, shall be limited to the number of booms for servicing. Service access panels shall be clipped and sealed to maintain the seal after replacement to prevent the transmission of contaminant in and out of the occupied space.

Integrated pre-engineered ceiling systems may be used within areas of monolithic ceilings.

.4 Provide smooth, solid surface, non-perforated and scrubbable ceiling surfaces in clinical areas as described in CSA Z8000 and in all rooms such as:

Inpatient washrooms;

ICU/HAU washrooms;

Personal Laundry rooms;

Airborne Isolation Rooms, ante rooms and washrooms;

Perinatal and Perioperative Operating Rooms including core and racetrack;

Procedure Rooms;

g) Utility Room- Soiled;

h) Utility Room- Sterile;

i) Medication Rooms;

Public and staff washrooms;

MDRD rooms;

Repackaging room- Hazardous Drugs- Non- Sterile;

Testing/Treatment Room-Pulmonary and Ante room; and

n) any other rooms identified in Appendix 2L ROOM FINISHES.

Infection Control for Walls

Walls will limit the passage of particles from the partitions separating adjacent areas in the clinical environment;

Vinyl surface wall covering (wall protection sheets or wall paper) will not be used in locations where there is a risk of moisture migrating though the sheet into the wall; and

Provide smooth, solid surface, no-perforated and scrubbable wall surfaces in clinical areas as described in CSA Z8000.

.6 Infection Control for Floors

Floors in all areas must be washable and able to withstand routine low-level hospital disinfection.

Penetrations must be properly sealed and maintain fire separations.

Floors in all areas, except for private offices, meeting rooms and conference rooms, must be seamless and/or have homogenous heat welded seams, and integral bases. Top of integral cove base must be sealed to wall.

Sealing of cove base to walls in pressurized rooms must meet the pressurization requirements for the room and maintain a constant seal around room and at corners.

All service rooms that are accessed from within patient care areas will have finished and/or sealed flooring that is easily cleaned.

Floors in private offices, meeting rooms and conference rooms may use 150 mm resilient bases. Top and bottom of resilient base must be sealed to the wall and floor to prevent moisture penetration.

.7 Infection Control for Enclosed Spaces

Enclosed spaces above ceilings and behind walls must be thoroughly cleaned of debris and dust and inspected by IPAC prior to installation of finished enclosure.

Infection Control for Airborne Isolation Room

Air barrier sealed Construction must be used in ceiling and wall Construction in all Airborne Isolation Rooms to ensure the ceiling and wall provides an effective pressurized air seal.

b) Mechanical, electrical and IMIT services, equipment and other penetrations must be sealed in AIR pressurized rooms to ensure an effective air seal.

Ceilings and walls in Airborne Isolation Rooms, ante rooms and pressurized rooms must be Designed and constructed to meet the specific pressure requirements for such rooms.

Doors or other openings such as pass throughs into the pressurized rooms must meet and maintain the pressurization requirements for the rooms.

No operable windows permitted in Airborne Isolation Rooms.

3.7.3 Sinks and Alcohol Based Hand Rub Hand Hygiene Stations

General

Prepare workflow plans for hand hygiene sink and Alcohol Based Hand Rub (ABHR) quantities and placement in collaboration with the Owner's Infection Prevention & Control personnel.

Scrub Sinks

Provide specialized scrub sinks in the following rooms or areas:

the surgical suite, Procedure Rooms and all areas where invasive sterile procedures occur;

other rooms or areas as indicated in Appendix 2A Clinical-Specifications.

Install Alcohol Based Hand Rub (ABHR) supplied by the Owner at hand hygiene stations in consultation with IPAC:

At all entrances/exits to the Building in areas that are immediately visible upon entry and easily accessible.

In other rooms or areas as indicated in Appendix 2A Clinical Specifications or as directed by the Owner.

In the following locations:

on the external wall immediately adjacent to the entrance to every inpatient room;

on walls immediately adjacent to the entrances to any patient care areas of any sort; and

adjacent to all points-of-care in all situations, except where the presence of alcohol would be contraindicated.

In areas that compromise patient safety such as:

in any location where PPE is donned or removed;

at all entrances to dirty and clean Service Rooms; and

and in any additional location where its use is required to comply with routine hygiene practices.

.4 Wall mounted Hand Hygiene Sinks

The Participants will provide sufficient hand hygiene sinks to encourage and assist public and staff to readily conform to hand hygiene protocols.

Provide hand wash sinks at the entry to the ICU and to all Inpatient Units and other locations as identified by Appendix 2A Clinical Specifications.

Provide wall mounted hand hygiene sinks in the corridors of the inpatient units. Provide one for every three inpatient bedrooms.

3.7.4 Equipment & Storage

Provide storage shelves that are:

cleanable with Owner's approved detergents and disinfectants;

not located under sinks; and

minimum 200 mm above the floor to permit routine cleaning.

.2 Provide dedicated storage space with power outlets for charging (e.g. alcove, equipment room) for large wheeled equipment (e.g. floor lifts).

If open shelving is provided for storage, the top and bottom shelf of such shelving will be a solid surface to prevent contamination from the storage space.

Sharps disposal boxes and patient waste disposal will be secure to avoid tampering or inappropriate access.

3.7.5 Furniture and Millwork

Organic finishes such as wood and fabric upholstered furnishings will not be used in clinical patient care areas.

.2 Furniture used in clinical areas and areas where direct patient care is provided will have :

non porous surfaces;

minimal cracks and crevices;

c) impermeability to water;

seams sealed and/or double stitched;

e) minimal pleating;

f) stain resistance; and

material that does not promote the growth of microorganisms.

.3 Durable, cleanable fabrics are appropriate in low risk areas. A low level of risk applies to any office areas where staff members are not providing direct patient care or return to after providing direct patient care.

.4 Vinyl upholstery must be medical grade and treated with superior bacterial protection. Vinyl fabric treatment should guard against surface growth of fungus, mold and mildew spores and have tough abrasion capabilities, resistance to scuffing and burnishing as well as, minimal off gassing.

.5 Textiles used will be durable, fluid resistant, low linting, soil and stain resistant, and cleanable with Owner's approved detergents and disinfectants. Textiles will be accompanied with manufacturers' instructions for cleaning and disinfection.

3.8 Safety and Security

3.8.1 The Participants shall plan and construct the Facility to produce an environment of care that is safe and secure for all occupants (patients, staff, and visitors).

3.8.2 The planning and Design of the Building and Site will include systems and Designed elements that achieve the following objectives related to the safety and security of patients, staff, and visitors:

security from criminal activity, such as personal assault or theft of property (e.g. Triage);

.2 safety from errors in the delivery of care (e.g., medication room Design);

.3 safety from internal environmental hazards (e.g., mould, and chemicals);

protection of physical privacy and personal dignity (e.g. exam room planning);

safety from equipment hazards (e.g., electrocution, and fire)

.6 ergonomic protection of staff from physical hazards (e.g., overexertion, repetitive stress, excessive bending, reaching, or lifting and tripping);

emergency preparedness and management of emergency conditions;

protection from terrorism or mass incident (Refer to Section 5.3);

.9 Design in accordance with Crime Prevention Through Environmental Design (CPTED) guidelines; and

.10 protection from hazardous waste disposal such as sharps disposal boxes and patient waste disposal through secure enclosures and containers which prevent tampering or inappropriate access.

3.8.3 Pharmacy

Design the Pharmacy areas in accordance with the requirements of the National Association of Pharmacy Regulatory Authorities (NAPRA), USP 797 – Guidebooks to Pharmaceutical Compounding – Sterile Preparations, USP General Chapter 800 Hazardous Drug Handling in Healthcare Settings and the Canadian Society of Hospital Pharmacists Guidelines for the preparation of sterile products in pharmacies.

.2 Provide, install and refer to Appendix 2I Equipment and Furniture for the requirements of two Laminar Flow Hoods, Medication Dispensing Carousel and other equipment in the Pharmacy department.

Provide and install and refer to Section 6.12.11 for the Medication Dispensing Carousel.

.4 Provide, install and refer to Appendix 2I Equipment and Furniture for the requirements for two Biosafety Cabinets in the Restorative Health Acute & Ambulatory Care Therapy Services Compounding Room, Chemotherapy Agents.

3.8.4 Laboratory

Design the Laboratory areas in accordance with CSA requirements for safety and Canadian biosafety standards.

.2 Refer to Appendix 2I Equipment and Furniture for the requirements of two Biosafety Cabinets, one Laminar Flow Hood and other equipment in the Laboratory department.

3.8.5 Medical Device Reprocessing Department (MDRD)

Design the MDRD areas in accordance with CSA Z314-18 Canadian Medical Device Reprocessing and the Canadian Association of Medical Device Reprocessing (CAMDR) standards and best practices.

.2 Refer to Appendix 2I Equipment and Furniture for the requirements for the Vertical Carousel and Section 6.12.10.

3.8.6 Biomedical

Provide and install one Laminar Flow Hood in the Mechanical Work area.

4 SITE DEVELOPMENT REQUIREMENTS

4.1 Site Plan and Master Site Plan Considerations

4.1.1 The Participants will develop and submit to the ALT for approval:

a Site Plan, which illustrates the Project; and

.2 a Master Site Plan, which illustrates the future potential for expansion on the Site.

4.1.2 The Site plans will reflect and develop the Owner's vision for the Project and Building.

4.1.3 Site development and urban Design requirements described in Section 4, the Building Design planning principles described in Section 5, as well as Appendix 2C Design Guidelines will be used as guiding principles for Design.

4.1.4 The Site Plan will illustrate the full Site development and the Building siting for the Project. The Site planning will demonstrate:

Maximizing the development potential of a greenfield Site;

.2 Optimizing the location of the Building footprint; and

Locating the Service Centre and Loading Dock location so that they do not impede future incremental and major expansion.

4.1.5 The Site Plan will locate:

Principal road access to the Site including Hospital Road North and South and service road access;

.2 Separation of traffic flows: service, public, ambulance and emergency;

.3 Heliport location and flight paths;

.4 Surface parking areas;

.5 Feature landscape and community trails; and

.6 Courtyards, healing gardens and children's natural play areas.

4.1.6 The Master Site Plan will illustrate Phase 2 horizontal and/or vertical additions to the Building and expansion sites for clinical program expansion including:

Development sites for the Building and their area in square metres;

Concept sketch floor plans for all levels indicating major horizontal and vertical circulation routes and connections to the Phase 1 Building;

Clinical program areas accommodated;

.4 Additional mechanical, electrical and IMIT service spaces required, and

.5 Any renovations or relocations required in the Phase 1 Building.

.6 Expansion areas for Service Centre and its area in square metres;

.7 Future feature landscape areas and community trails;

Future parking strategy for parking displaced by Facility expansion; and

.9 Maintain the flight paths for the Heliport.

4.1.7 The Master Site Plan will illustrate Phase 3 Building expansion sites including:

Separate Building sites for a future development options and development areas in square metres;

Expansion areas for Service Centre and its area in square metres;

Future feature landscape areas and community trails;

Future parking strategy for parking displaced by Facility expansion; and

Maintain the flight paths for the Heliport and if required, relocation of the Heliport.

4.2 Pre-Construction Enabling Alliance Works

4.2.1 The Owner has completed a Phase Environmental Assessment of the Site in support of the Project.

4.3 Urban Design and Site Development

4.3.1 General

The Participants will implement requirements in the Bell McKinnon Local Area Plan (BMLAP) and the development requirements referenced in the Municipality of North Cowichan's Official Community Plan Zoning Bylaw 3717.

.2 The Bell McKinnon neighbourhood is under transition from a rural community to a suburban development with the new hospital a key generator of growth. The CDHRP will contribute to a sustainable neighbourhood where people can live, work, and play. Include Design features that will give the Facility an appropriate identity in the overall suburban context.

Minimize the impact of Site development and Building placement on adjacent neighbours and land uses.

.4 The Participants will Design and construct the Facility so that it is a suburban, pedestrian-oriented environment.

.5 Retain as many existing trees on the Site as possible to reduce the impact of the Facility on its neighbourhood context, especially adjacent to the agricultural land to the east , and to contribute to the natural healing environment for patients, visitors and staff.

.6 Minimize the adverse micro-climatic effects arising from the location and configuration of parking, walkways and Buildings, including effects of Building entrance orientation on patient, staff and visitor comfort and safety.

.7 Reinforce the physical relation of the structures with the major streets and create a legible Site layout and pattern to foster a strong sense of place and identity and to ease increased vehicular and pedestrian penetration of the Site.

The Participants will ensure furniture, landscape materials and accessories in all Facility outdoor spaces (patios/courtyards/amenity spaces) within a 30 metre vertical distance of the Heliport deck are Designed to be unaffected by helicopter rotor downwash.

Facility outdoor spaces that fall within these parameters will be equipped with an audible warning directing persons to shelter inside during helicopter arrivals and departures;

The audible warning will be configured to be activated remotely by heliport security personnel; and

Rotor downwash for the Leonardo AW139 will be considered.

4.3.2 Vehicular Circulation

Design for the functional separation of emergency vehicles from public, staff and service vehicle traffic for the purpose of minimizing interference between ambulance and other emergency vehicle access and other types of traffic.

.2 Clearances shall be provided at ambulatory and emergency entrances for simultaneous drop off and pick-up of patients and visitors without blocking the entrances.

Public access to emergency care shall be distinct from emergency vehicle access and shall be well marked to facilitate entry from public roadways. Public parking lots shall be provided near the emergency entrance and for entrances to ambulatory care services.

.4 Integrate vehicular circulation with layout of pedestrian and bicycle zones throughout the Site to provide visible connections, promote safe travel, and to minimize conflict between vehicles and other modes of travel.

Design the roadways to provide connections between the surrounding roads and the main entrances to the Buildings. Design vehicular service entrances so that they are integrated into the Building Design with minimal visual impact.

.6 Minimize grade changes for drop curbs and raised crossings. Drop curbs aligned to pedestrian crossings.

.7 Provide curb-cuts or curb let-downs in appropriate locations to facilitate convenient and direct access from the parking space(s) to the Building(s) for people with disabilities. This includes all locations where pathways cross parking areas.

Utilize paving patterns which can easily be differentiated from vehicular paving by pedestrians where they cross vehicular traffic to access the Emergency Department and main entrance.

.9 Provide emergency vehicle response access to the Site as required by Fire Department and other emergency agencies.

4.3.3 Pedestrian Circulation

Create a high-quality, vibrant, pedestrian-friendly environment, by tying the sidewalks and pathways to existing sidewalks and pathways adjacent to the Site.

.2 Provide public pedestrian network of pathways by connecting public pedestrian-oriented walkways to the main entries, public pathways, public sidewalks and transit bus drop off areas, as well as, access to parking lots.

.3 Provide safe pedestrian crossings that are clearly Designated using pavement markings and signage. In areas where a high volume of pedestrian crossings is expected, provide for changes in surface material (such as from asphalt to concrete, for example).

.4 Create access for the mobility impaired (including baby strollers, wheelchairs, scooters) by providing paths of travel with a minimum clear width of 2m connecting all open space areas. Include a tactile strip for the visually impaired wherever possible (especially near main entrances).

.5 The primary pedestrian systems, public open space, walkways and entrances to the Facility must be universally accessible to the physically challenged and be elderly

friendly. Design features which segregate circulation / areas / uses for people with disabilities from typical public usage are discouraged

Provide clear, direct pedestrian routes through parking lots that are unimpeded by parked or moving vehicles.

.7 Provide pedestrian connections from the perimeter sidewalks on Bell McKinnon Road, Hospital Road North, Hospital Road South and the regional walking trail along the East boundary to the interior of the Site. Coordinate with the Municipality for tie in with future trails and paths as required by the Municipality.

Provide a sidewalk from the transit hub on Bell McKinnon to a main entrance.

.9 Surface of sidewalks must be wheelchair accessible and capable of being cleared of snow and ice with vehicular equipment without damage.

Minimize pedestrian crossing distance at crosswalks by using curb extensions

.11 The pathway system should incorporate landscape treatments with trees and benches, lighting, and distinct paving where appropriate.

All sidewalks and other paved areas must have positive drainage to shed rainwater quickly with minimum side slope gradients of 1.0%.

.13 Major entrance walkways must be wide enough to allow for two people walking side by side and someone passing (i.e. minimum 2.5 m wide).

.14 Access doors to underground service vaults will not be located on pedestrian sidewalks.

4.3.4 Bicycle Circulation

Provide safe bicycle circulation from the perimeter of the Site to bike racks at all main entrances and to the Facility's bicycle storage and end of trip facilities.

Where possible provide separated bike lanes, separated from vehicles and pedestrians by barriers such as bollards, or Designated by markings on asphalt or changes in ground plane materials.

Provide safe and logical bicycle circulation at all intersections and where different transit modes intersect.

4.3.5 Main Building Entries and Patient Transfer Entry

.1 Ensure access to all main Building entries is visible from the roadways to assist in legibility and wayfinding.

.2 Design for maximum access into the Facility. Provide separate and distinct passenger-side drop-off areas at each of the main entrances to the Buildings and the Emergency Department walk-in entrance.

.3 Cover passenger-side drop-off areas at each of the main entrances to the Buildings and the Emergency Department walk-in entrance with a continuous canopy that is connected to the Building and provide where necessary wind breaks.

The covered entries shall include comfortable benches or chairs for people waiting outside. Provide seating for at least three groups of three people.

Provide a separate covered patient transfer entry which is separate from the Main Building Entry. Provide parking stall for transfer vehicle adjacent to entry.

.6 Provide entry plazas and planting adjacent to all main Building entries and include:

Public art, such as Welcoming Figures;

Covered canopies with weather sheltered areas for seating;

Planting with seasonal interest that is low maintenance; and

Water and electrical outlets.

.7 Differentiate Building entries by using a special ground plane treatment such as decorative architectural finished concrete, and/or natural stone, ensuring that the surface is slip-resistant and free of any tripping hazards. Avoid the use of coloured concrete and concrete unit pavers.

4.3.6 Public Realm and Open Space

Design and construct the Facility with consideration for the legibility, quality and consistency of the overall treatment of the public realm, including public open space, pedestrian corridors and streets, to achieve the urban Design objective for a unified and attractive built environment.

Achieve segregation between different open spaces through landscape barriers such as fencing, walls, hedges and planting.

.3 Situate Building so that it maximize the availability of sunlight in exterior and open spaces and areas of high pedestrian use. Maximize sunlight exposure for private and secure open spaces.

.4 Design landscape and circulation routes to have clear unobstructed views of surrounding areas for safety surveillance.

Create open landscaped spaces both urban and natural for the benefit of patients, visitors and staff which provide opportunities for recreation and contribute to a cohesive, healthy community; capitalize on opportunities for outdoor areas of respite and repose to aid in providing a healing environment.

.6 Unify the ground plane treatment through the use of common paving materials and finishes, tree grates, planting, lighting and other landscape furniture items.

.7 Provide and coordinate Design for Site furniture, including benches provided at regular intervals for ease of use particularly for the infirm. Select products on the basis of safety, comfort, Design, and materials that relate to the Facility architecture and landscape Design, durability and required maintenance.

4.3.7 Community Noise Protection

Strategically locate and/or silence mechanical and electrical equipment, outside air intake and discharge openings and emergency generators' engine exhausts to minimize public annoyance.

Design and construct the Facility so that noise levels from mechanical and electrical equipment, except emergency generators, at the nearest residential property lines do not exceed;

45 dBA between 8 pm and 8 am; and

65 dBA between 8 am and 8 pm.

.3 Ensure that electrical and mechanical noise levels in outdoor patient lounge areas and public sidewalks do not exceed dBAs in 4.3.7.2.

4.3.8 Services Screening from Public View

Screen from view as much as possible, to all refuse/recycling areas, shipping, loading or utility areas, satellite dishes, outdoor vents, mechanical equipment, transformers and other similar structures.

.2 Locate visual screens so that they also serve as noise screens for components that generate outdoor noise including transformers, mechanical equipment and shipping / loading areas.

Design the enclosure of the outdoor refuse/recycling areas to coordinate with the overall Design of the Site.

4.3.9 Site Wayfinding and Exterior Signage

Provide Site wayfinding and exterior signage in accordance with this Schedule and CSA Z317.14 Wayfinding for Health Care Facilities.

.2 Coordinate with and provide a Site signage plan for approval by the ALT.

.3 Wayfinding will start at the Site property lines with freestanding illuminated exterior signage located at each prominent Site entry location.

.4 The principle of progressive disclosure will be used in creating the information displayed on the signage.

.5 Arrange pedestrian pathways to ease wayfinding and create an amenable environment for pedestrians through the use of coordinated methods of wayfinding which inform people of routes through the Site to specific Buildings and entries or to the major street and transit nodes.

.6 Encourage pedestrians to avoid unsafe vehicle roads by providing well signed alternative pedestrian routes.

Signs to discourage inappropriate behaviour on the Site such as: violence prevention, smoking, skateboard and bike stunting.

Provide external directional signage that:

Clearly identifies the Building and its key destination components, including the Emergency Department, Restorative Health Acute & Ambulatory Care Therapy Services;

General Medical/Surgical Inpatient Units, ICU, main entry drop off area, and public and staff parking; access and egress from the Site; and

Is well illuminated, backlit, reflective or high contrast and easily visible at night; and minimizes light spillage.

.9 Supplement the entry signs with free standing signage structures located throughout the Site to give overall direction within the Site. The illuminated exterior signs must have an overall Site plan graphic and have weather protection for standing viewers.

Site banner signs to be located at strategic locations on the Building and on the Site at main entries to advertise hospital events and fundraising campaigns.

Overall Site parking signage is required to follow consistent Design intent for the Site.

Provide all necessary exterior illuminated signage to direct traffic from the access streets.

.13 Design and construct such signage so that it is visible for drivers of vehicles to identify at a far enough distance so that they can safely slow down and follow the signage to enter the Facility and the parking areas.

4.3.10 Gateway Elements

Provide a signature gateway element located at the primary approach to the Site such as at the corner of Bell McKinnon Road and Hospital Road South to add to the overall identity and character of the Site.

.2 Provide secondary gateway elements at key moments along the perimeter of the Site to define the boundary of the campus in a compelling and inviting way.

.3 Gateway elements should be highly visible and attractive features such as public art, Indigenous art, architectural Designed wayfinding structures, or icon natural landscape elements such as large trees, ornamental trees, or large boulders.

Coordinate the gateway elements with the Design of the streets and with the overall Site Design.

.5 Coordinate the gateway elements with the Site Wayfinding and Exterior Signage requirements.

4.3.11 Site Lighting

Provide lighting for public outdoor spaces to create an unobtrusive, human scale lighting concept, with a hierarchy of fixture types Designed according to functional and security needs (including CPTED).

Light fixtures within the reach of pedestrians will be vandal resistant.

Lighting on all pedestrian paths will illuminate not just the path but also the surrounding area adjacent to the path.

.4 Provide lighting to facilitate ease and safety of pedestrian access to public transit.

.5 Provide lighting for on Site roadways, walkways, drop-off and parking areas within the Site to ensure safe vehicle and pedestrian traffic with respect to collisions, personal safety, and Building access and egress.

.6 Lighting Design considerations should address patients' and neighbours' privacy from all storeys.

Prevent light trespass into inpatient rooms and neighbouring yards and windows.

Prevent lighting glare, shadow or high contrast with surrounding areas.

Site lighting will conform to LEED® light spillage requirements and shall comply with sharp cut-off (dark sky compliant) to meet LEED Certification. Match existing lamp sources on the street.

4.3.12 Wellness Pathway

.1 Provide a continuous, universally accessible pathway and sidewalks for pedestrians that encompasses the campus as well as shorter connected loops that allow for a variety of experiences.

The Wellness Pathway will include a mix of sidewalks and meandering pathways, with a continuous, surface treatment of concrete for sidewalks and asphalt for pathways in landscaped islands and landscape buffers.

The Wellness Pathway will be universally accessible and will respond to the special needs of those with challenges posed by illness, disability, or age.

.4 Design the Wellness Pathway to pass through the eastern landscape buffer with opportunities for people to connect with nature and find moments of quiet reflection.

Include seating at consistent intervals of approximately 40m along the Wellness Pathway.

Incorporate interpretive elements and signage and consider opportunities for public art at key moments along the pathways such as at intersections and transitions to the eastern landscape buffer.

Include Indigenous elements along the pathways such as interpretive signage with Indigenous plant names and stories, gathering circles, a place for smudging, and Indigenous art. Work with Indigenous rights holders to determine the best and most appropriate Indigenous elements for the Site.

.8 Provide an area for a covered structure as a destination in consultation with Indigenous rights holders.

4.3.13 Outdoor Café Courtyard

The Outdoor Café Courtyard will be directly adjacent to the interior Cafeteria with clear sightlines and clear pedestrian circulation from the interior space to the exterior space.

Provide a variety of seating options including areas for small groups to gather, areas for families, and private, quiet areas.

Provide seating for the Outdoor Café Courtyard in the form of raised planted landforms with seating edges as well as movable chairs for flexibility.

.4 Provide space for a minimum of 10 tables of that can be combined or moved to accommodate different group sizes, events, and gatherings.

.5 Plant a minimum of 4 small-medium shade trees to create seasonal interest and a comfortable microclimate throughout the seasons.

4.3.14 Indigenous Garden

The Indigenous Garden will be adjacent to the Gathering/Sacred Space with clear sight lines and clear pedestrian circulation from the interior space to the exterior space.

.2 The Indigenous Garden will be a quiet, tranquil space for reflection and healing that is welcoming to all and publicly accessible.

Work with the Indigenous rights holders to Design the space to celebrate First Nations, Metis and Indigenous people and culture, and to determine any programmatic needs that are desired for the space such as for traditional healing practices, Indigenous art, fire element, interpretive signage, and/or a storytelling circle.

.4 Provide a physical separation and protective element such as a garden wall, seat wall, decorative fence, or trellis to separate the garden from adjacent uses, especially parking, without blocking sightlines.

.5 Provide seating elements that encourage social interaction and gathering, where people are encouraged to sit together rather than apart.

Include space for growing traditional healing plants used by First Nations, Metis and Indigenous people and managed by the Owner's Indigenous health team at the Facility.

.7 Include an area that provides protection from the elements, such as a canopy off of the adjacent Building façade or a small pergola.

Include storage for equipment related to programmatic activities and maintenance.

.9 The plant palette for the Indigenous Garden is to consist exclusively of plants Indigenous to the local area as determined through consultation with the Indigenous Advisory Council.

4.3.15 Therapeutic Garden

The Therapeutic Garden is to be located near to the main entrance, with clear sightlines from the front door to the garden. The Garden will be universally accessible and at-grade.

The Therapeutic Garden will have a minimum area of 100m².

The Therapeutic Garden will provide a safe, meditative, green space for small gatherings, private moments of respite, quiet contemplations, walking, light exercise, and other therapeutic activities.

.4 The Therapeutic Garden may be located above structure and will therefore be an intensive green roof. The green roof should be Designed to provide sufficient plantings to create a garden character while carefully planning to reduce loads by placing trees above columns. Therapeutic Garden will not be placed on structural elements in area for expansion.

.5 Provide raised garden beds with edges that allow people, including people in wheelchairs, to get close to the plants as well as seating edges where people can rest underneath shade trees.

.6 Include a meditation walking path such as a labyrinth, or winding path, and integrate it as part of the Therapeutic Garden rather than a separate feature.

Use vegetation, coniferous trees and shrubs, and trellises to screen adjacent uses such as to the sheltered ambulance bays, FMO maintenance compound, and Loading Dock area.

.8 Design a garden that maximizes the biophilic, health benefits of connecting with nature. Consider seasonal interest in the planting Design, using evergreen shrubs for overall structure and perennials that reveal the cycles of the seasons.

.9 Incorporate human scaled furniture to invite individuals and small groups to sit and relax. Incorporate tranquil lighting for visitor safety and to create a calming ambience for winter evenings.

.10 Include a sheltered canopy for weather protected gathering.

4.3.16 Landscape Planting

Provide landscape for the complete Site that contributes to a liveable, healthy and responsive community.

.2 Provide low-maintenance gardens, diverse tree canopy, planted islands, and naturalized areas throughout the Site for the enjoyment of staff and visitors.

.3 Consider the experiential quality of the exterior landscape as well as views to and from green spaces, from the interior.

.4 Provide streetscape landscaping, such as street trees and boulevards, to municipal guidelines and standards (as a minimum). Verify streetscape landscape requirements with the local Municipality.

.5 Provide an open space for respite and repose dedicated to patient and family use directly accessed from the Facility without needing to cross roads or parking areas.

.6 Use native and/or locally adapted deciduous trees and coniferous trees that provide seasonal interest in association with ground covering shrub plantings and perennials.

Coordinate Site planting selection and Therapeutic Garden planting selection with Indigenous rights holders.

Provide non-invasive plant material; remove all invasive and noxious plants.

.9 Design planting to be low maintenance. Use of Indigenous flora will be considered a priority, in terms of minimizing maintenance and expressing an attitude about the local forest context.

.10 Design the Site to provide for snow and ice removal from roadways, parking and pedestrian pathways and for its storage on Site in Designated areas.

.11 Design for the requirements of safety Design principles such as CPTED.

.12 Use large numbers of single species, in groups, to help unify the landscape character, create recognizable spaces, contribute to Site orientation, and create a strong sense of place.

.13 Group plants to minimize the use of water, chemicals and fossil fuel for routine maintenance and to promote a healthy local ecosystem using sustainable measures.

.14 Unify the ground plane treatment through the use of common paving materials and finishes tree grates, planting, lighting and other landscape furniture items.

.15 Provide and coordinate Design for Site furniture, including benches provided at regular intervals for ease of use particularly for the infirm. Select products on the basis of safety, comfort, Design, and materials that relate to the Facility architecture and landscape Design, durability and required maintenance.

.16 Provide pedestrian surfaces that are suitable for use by wheelchairs, double-wide strollers, and small wheeled medical devices. Except where noted otherwise, crushed rock surfaces will not be suitable for any outdoor space surfaces. Asphalt surfaces will not be suitable for outdoor spaces surfaces in courtyards.

.17 The Site Design should provide for universal access, with the exception of the east naturalized buffer area.

.18 Provide landscape Site plans for the complete Site. Landscape plans to be prepared by a BCSLA registered landscape architect.

.19 Maximize the amount of landscape areas on the Site and minimize the amount of impervious surfaces to increase the natural absorption rate of storm water to have soft landscape, including trees, shrubs, groundcover and grass.

.20 Refer to Sections 8.2.3.7 Site Furnishings and 8.2.3.8 Planting Material for detailed descriptions of street furniture and planting requirements.

.21 Planting for Gathering/Sacred space garden to be Designed in conjunction with the Indigenous rights holders as well as review and selection of plant species in other areas.

4.3.17 Secure Outdoor Spaces

.1 The Participants will provide two separate dedicated Secure Outdoor Spaces in the Psychiatry Inpatient Unit.

One is directly accessible from the common areas of the Psychiatry Inpatient Unit; and

the other is directly accessible from the PICU.

.2 The PICU Secure Outdoor Space will be 100m².

Participants will provide a 100m² Secure Outdoor Space for the Psychiatric and Evaluation Stabilization Zone Secure in the Emergency Department.

.4 The Secure Outdoor Space for the Psychiatry Inpatient Unit will be 400m2 and must have several weatherproof roof covered areas for 6 people, with one adjacent to the Building and the others located in the courtyard.

.5 Not used.

.6 Further specifications are detailed in Section 8.2 Exterior Improvements and Landscape and in the Appendix 2A Clinical Specification.

.7 The Secure Outdoor Spaces will have vertical security screens to 3600mm height extending along any exposed perimeter that is not contained by a Building exterior wall of over 3600mm height.

The security screen will allow for vision to the outside and be absolutely non-climbable with no protrusions on the inside to provide a handhold or foothold at any height as well as having no openings for material to be passed through.

.9 The screen material used should have a non-institutional appearance, prevent ligature and be highly impact resistant.

All planting material used will prevent hiding and allow full body observation.

.11 The Secure Outdoor Spaces will be Designed to prevent patients from harming themselves or others and;

.12 All areas of the Secure Outdoor Spaces will be covered by CCTV.

4.3.18 FMO Maintenance Compound Enclosure

.1 Provide a fenced FMO maintenance compound encompassing the FMO Vehicle Storage Garage and Vehicle Carport, and exterior service equipment (bulk oxygen , transformers, generators etc.) enclosed by a minimum 2.4m high fence with lockable two (2) leaf gate.

.2 Vehicle Storage Garage will contain storage of vehicles, lawn cutters, bobcats, maintenance materials, salt, and equipment.

Construct Vehicle Storage Garage with materials that are consistent with its function. Coordinate exterior cladding colours with the Buildings on Site. Alternative cladding material can be used such as preformed metal sliding.

.4 Locate the FMO maintenance compound adjacent to a perimeter road to increase the operational efficiency of FMO related activities and servicing of the equipment.

Allow for sufficient manoeuverability within the compound for service vehicles.

.6 Construct Vehicle Carport with materials that are consistent with future function as an enclosed garage. Provide insulated, durable roof complete with 600mm soffit overhang, and foundations and footings for future enclosure.

4.3.19 Site Safety Through Design

The Participants will Design to meet:

The requirement for safety Design principles in Crime Prevention Through Environmental Design (CPTED) for all Building and exterior areas of the Site, and specific Psychiatric Secure Outdoor Space requirements (see 4.3.17 Secure Outdoor Spaces).

Follow the CPTED four key principles:

Natural Access Control;

Natural Surveillance;

Territoriality; and

Maintenance.

.2 Public spaces should be distinguishable from service spaces.

.3 Design the exteriors of the Site so that there are opportunities for people to easily view what is happening around them during the course of their everyday activities.

.4 Eliminate entrapment spots. Incorporate barriers that permit visual access without loss of privacy such as glazing in lobby doors and stairwells.

.5 Promote the "eyes on the street" concept by using windows, doors, and activity generators such as seating. Windows should be visible from the street and not hidden by vegetation or other items.

.6 Incorporate CPTED principles in the Design of all exterior areas of the Sites.

.7 Reduce opportunities for graffiti through the use of anti-graffiti coatings.

.8 Reduce opportunities for exterior hiding spaces and eliminate hiding spaces in interior spaces in particular, stairwells.

.9 Provide a method for users to readily summon for help if in distress or danger.

4.3.20 Accessibility

The Participants shall Design the Site to be universally accessible, and to be fully accessible to people with disabilities.

.2 Access, egress routes, entrances and all exterior courtyards, gardens, patios, walkways, pergolas, decks, will be accessible for persons who require mobility aides, as well as people with strollers.

.3 Provide primary and secondary pedestrian pathways.

.4 Provide structurally supported concrete apron slabs at the point of access to the Facility to ensure ongoing barrier free access.

.5 Provide ramps where grade changes necessitate it and ensure sufficient width between handrails on either side of the ramp to allow two wheelchairs to pass.

Construct stairways with a landing after a maximum of ten (10) risers and include handrails on either side of stairways.

.7 Include rest areas with accessible seating and pullout off of the primary circulation for people in wheelchairs at 40 metre intervals along the Wellness Pathway in planted islands and in landscape buffers.

Provide edge protection along pedestrian pathways to prevent wheelchairs from catching a wheel at the edge. Grading or guard rails are acceptable.

4.3.21 Children's Natural Play Garden

The Site will include a natural play garden. Natural Play Garden to be defined as use of site elements such as logs, soil, vegetation and rocks to create a play area. No prefabricated play elements to be included.

.2 The Natural Play Garden is to be located near to a main Building Entry, with clear sightlines from the exterior entry doors to the play area. The intent is not for a traditional playground design, but rather a play garden that integrates into the Site and celebrates the natural, cultural and healing context of the Site.

The Natural Play Garden will have a minimum area of 50m2, as demarked by a play appropriate ground cover determined by the designer.

.4 The Natural Play Garden will include natural play elements for children from 2-5 years old and for children from 5-12 years old. Play elements may include climbing stumps, hill slides, climbing structures, and other natural play elements as determined in consultation with the Owner to provide a playful, fun, and safe environment. Elements that are universally accessible and inclusive will be incorporated into the Design.

.5 A minimum of two benches will be provided adjacent to the Natural Play Garden for parents and caregivers.

The Natural Play Garden will be integrated into the surrounding landscape context in a sympathetic and cohesive manner, so it becomes a supporting amenity space for the Site landscape.

.7 The Natural Play Garden will be physically separated from adjacent roadways or parking areas and be connected to the Site's accessible pedestrian walkway system. The Natural Play Garden will be situated to take advantage of natural Site features such as, topography or existing trees to

.8 Trees, shrubs, perennials, play elements and features and any supporting Site furnishing will be designed to create a warm, welcoming and playful space that is fun and inviting year round.

.9 Designed elements should meet CSA standards for natural playgrounds and promote a safe and fun play environment. The Design will be reviewed and approved by a BC playground inspector for CSA compliance for safe playground design. Fall height requirements and safety surfacing are required per CSA standards.

4.4 Parking

4.4.1 General

The Participants will provide parking for the Facility in accordance with the requirements of Schedule 2 and all applicable municipal Standards.

4.4.2 Facility Specific Requirements

For the CDHR Facility

Provide 800 vehicle parking stalls as follows:

440 stalls for physicians and staff;

347 stalls for visitors;

2 handy DART bus transit stops, drop off spaces and 2 taxi stands;

3 dedicated parking stalls for ambulance s and 1 dedicated stall for police, adjacent to the Emergency Department;

3 Emergency Department patient drop off spaces;

1 dedicated parking stall for passenger and vans near entry for the Emergency Department PES Unit; and

1 transfer ambulance stall.

.2 Included in the 800 stalls provide:

a minimum of 28 accessible parking stalls located adjacent to entries;

64 stalls adjacent to the Emergency Department entrance; and

100 stalls adjacent to the Restorative Health Acute & Ambulatory Care Therapy Services entrance.

10 of the staff parking spaces must have an installed energized charging station capable of providing Level 2 charging for an electric vehicle:

Provide each charging station with a dedicated circuit.

b) A maximum of two vehicles may be charged per charging station.

.4 In addition to the 800 parking stalls required above, provide:

a) 30 motorcycle parking stalls and any additional motorcycle parking stalls as may be required by the Municipality.

secured, long term, covered bicycle parking with staff only access. Space for 40 bicycles.

c) unsecured, short-term bicycle parking for 30 bicycles.

4.4.3 Parking Stall Sizes

.1 Parking stalls will comply with the following:

minimum parking stall dimensions will be 5.8 m x 2.6 m, provided that:

a maximum 25% of the total stalls may be for small cars and have minimum dimensions of 4.6 m x 2.6 m;

ii) pick up and drop off areas, minimum stall dimensions will be 3.0 m wide x 12.0 m length with 5.0m in vertical clearance from the finished paved area;

iii) minimum dimensions for accessible stalls will be 3.7 m wide including at least 1.2 m of width, which may be shared with an adjacent parking stall; and

iv) minimum drive aisle widths will be 7.6 m.

4.4.4 Parking Design Principles

Design and construct a surface parking in accordance with the following:

provide adequate provision for ingress and egress to all parking spaces to ensure ease of mobility, ample manoeuvring clearances, and safety of vehicles and pedestrians;

apply CPTED principles and the following principles:

reduce opportunities for graffiti through the use anti-graffiti coatings and art;

ensure the parking is well-lit while minimizing light spillage into adjacent properties; and

c) clearly mark all parking spaces;

use wayfinding strategies, including signage, to allow each parking zone to be identifiable and to assist in orientation and ease of finding/identifying parking

stalls;

set parking lot layouts in an orderly and logical Design to minimize confusion and excessive internal circulation;

parking must not be located in visually remote areas of parking lots, behind blank walls, or within service or loading areas; and

g) Provide an asphalt, concrete or permeable pavement surface for parking lots. Gravel is not acceptable.

h) Where a wheel stop is provided, the portion of the parking space between the wheel stop and the front edge of the parking space may be surfaced with landscaping, provided that no landscaping exceeds 0.15m in height and provided sidewalks or other pedestrian paths are not obstructed. The pavement structure and longevity will not be compromised by the landscaping.

.2 Provide all parking lots with the following landscape requirements:

screen surface parking by plant material, and where surface parking is behind Buildings, screen such surface parking from adjacent properties with landscape planting or trellis strips;

screen the view of the bumpers of parked cars from all perimeter roadways, residences, and pathways;

incorporate safety and security measures into the landscape Design;

surface parking must contribute to the continuity of the street landscaping edge without compromising the safety and security of the public inside the lot and on the public street;

reduce the visual impacts of large surface parking lot areas by dividing the parking area into smaller 0.6 ha parking lots defined at the boundaries by drive aisles, sidewalks, trees and landscape planting; plant shrubs and small trees to define circulation routes for pedestrians and vehicles;

multiple surface parking lots must provide a direct pedestrian pathway system through the parking area to provide convenient and safe pedestrian access between Building entrances, parked cars, and sidewalks of adjoining streets.

g) see Schedule 2 Statement of Requirements Section 8 for detailed description of landscape requirements for parking lots.

4.4.5 Bicycle Parking

Provide bicycle parking facilities that are at-grade, have uniform lighting and are safe and secure. Lighting Design for the bicycle storage area shall take into account the Facility Risk Assessment and the lighting Design shall be in accordance with CPTED guidelines.

.2 Provide secured, weather protected long term bicycle parking for employees. Locate adjacent to Building entries, or within the Building.

Provide public, unsecured, short-term bicycle parking in the form of bicycle racks located within 15 m of a principal Building entry. Such bicycle parking must be situated in well-lit locations, clearly visible from principal Building entries and/or public roads.

.4 Bicycle racks must be made of sturdy, theft-resistant material and should be secured to the floor or ground. Bicycle racks should be Designed to secure the bicycle frame, not the wheels, and allow both the frame and front wheel to be locked to the rack with

a U-style lock. Bicycle racks should support the bicycle in an upright position, providing at least two points of contact with the bicycle frame and a minimum of 800 mm tall and 450 mm wide.

.5 In the secure staff bicycle parking area provide access to an integrated electrical outlet to facilitate bicycle charging to 20% of bicycle parking. A standard 110V wall receptacle is required for charging.

4.5 Utility Infrastructure -Off Site Utilities and Civil Works

4.5.1 The Participants will provide, as necessary, adequate and reliable infrastructure and necessary municipal services to the Facility.

4.5.2 Municipal Off-Site Services Infrastructure

General

a) The Participants will confirm and comply with any required off-Site services as required by the Municipality.

Design and construct all municipal off-Site services, connections or upgrading of municipal systems as needed or as required by the Municipality such that the off-Site municipal infrastructure is adequate to support the Facility, to the satisfaction of the Municipality and other governmental authorities. Refer to the applicable Municipal documents for land development and municipal servicing engineering Standards.

All Alliance Works required for excavation, exposing, backfill and surface restoration of all proposed water, sanitary sewer and storm service connections, as well as the connection of each service to the municipal system, will be the responsibility of the Participants.

4.5.3 Potable Water – Off-Site

.1 The Facility requires a redundant water supply therefore two municipal water mains are to be constructed to Site.

The details pertaining to the connections to the Municipality owned water system must be acceptable to the Municipality of North Cowichan's engineering department.

.3 The extent to which provision for on-Site pumping is required to suit either domestic demand or fire-fighting demand, or both, will be determined, in part, by the final Building floor area, Building height and the pressure supplied by the municipal water system.

.4 Water mains owned by the Municipality shall be upgraded to the extent required to provide the Facility with the volume and pressure necessary to meet the requirements of the Fire Underwriters Survey (FUS) calculation, the BC Building Code and be acceptable to the Municipality of North Cowichan's engineering department. See Section 7 Mechanical Fire requirements.

Construction of municipal water infrastructure as follows:

Upgrade the watermain on Herd Road from TransCanada Highway to the eastern limit of construction of the Heard Road/TransCanada intersection improvements with a 250 mm diameter PVC main and all associated appurtenances.

Upgrade the watermain on Herd Road from the western limit of construction of the Bell McKinnon Road/Herd Road roundabout to Bell McKinnon Road with a 250 mm diameter PVC main and all associated appurtenances.

Upgrade the watermain on Herd Road from Bell McKinnon Road to the eastern limit of construction of the Bell McKinnon Road/Herd Road roundabout with a 300 mm diameter PVC main and all associated appurtenances.

Upgrade the watermain on Bell McKinnon Road from the existing 300mm ductile iron watermain approximately 110m north of Drinkwater Road to the northern limit of construction of the Bell McKinnon Road/Herd Road roundabout with a 400 mm diameter PVC main and all associated appurtenances.

Construct a 200 mm diameter PVC watermain loop on Hospital Road North, Hospital Road South and the main north-south roadway through the Site.

Connections at Norcross Road, Fairfield Road and Ortona Rd to be 200 mm diameter PVC watermain then transitioned to connect with the existing watermain.

g) Maintain existing offsite hydrant spacing.

h) Replace existing water services up to meter box. Existing meter boxes and meters to remain.

.6 Valving shall be provided on the municipal watermains to permit either water service to be isolated for maintenance without affecting Facility operations.

Valving is to be provided to allow for uninterrupted water service to the Facility. Scenarios to be considered include disruption to:

the watermain north on Bell McKinnon Road;

the looped watermain on Hospital Road North and South;

c) the watermain along the hospital frontage; or

the watermain south on Bell McKinnon Road.

4.5.4 Sanitary Sewer – Off-Site

.1 The Facility requires a sanitary sewer connection.

.2 The details pertaining to the connections to the Municipality owned sanitary system must be acceptable to the Municipality of North Cowichan's engineering department.

Construct the following sanitary sewer upgrades:

From Drinkwater Road to the Norcross Road, crossing private property through the Municipality of North Cowichan's 10 meter Statutory Right of Way, a 450mm diameter PVC sanitary main;

From Norcross Road to the northern limit of Herd Road/ Bell McKinnon Road roundabout improvements, a 300mm diameter PVC sanitary main;

c) From the Herd Road / Bell McKinnon Road roundabout to the eastern limit of the road improvements, a 250mm diameter PVC sanitary main; and

A 200mm diameter PVC sanitary sewer main under Hospital Road South from the sanitary sewer under Bell McKinnon Road to the limits of the road improvements.

4.5.5 Storm Drainage – Off-Site

Storm water modelling and analysis to be completed as described in the municipal standards and account for the effects of climate change by incorporating adjusted rainfall volumes into the drainage analysis.

.2 The off-Site storm system connection will be to the existing storm main in Bell McKinnon Road subject to the approval of the Municipality of North Cowichan.

The Participants must employ on-Site storm water management strategies which result in no net increase in peak storm water discharge rates up to the 5 year recurrence interval event.

.4 Flows in excess of the 5 year storm event are to be discharged from Site via an overland flow route. Flows are to be directed to municipal roadways or drainage rights of way.

Construction of municipal storm water infrastructure as follows:

Upgrade the existing 600 mm diameter culvert that crosses through the property 6767 Trans Canada Highway (storage units Facility). The upgrade shall accommodate a 10 year event with HW/D equal to or less than 1.0 (no surcharge), and a 200 year event with maximum surcharge of HW/D equal to or less than 2.0 (surcharge of one pipe diameter) if Site conditions permit, otherwise size for 200 year event with HW/D less than or equal to 1.0.

b) Upgrade the existing 750 mm diameter culvert that crosses under the railroad tracks west of the Trans Canada Highway and 330 meters south of Cowichan Valley Highway. The upgrade shall accommodate a 10 year event with HW/D equal to or less than 1.0 (no surcharge), and a 200 year event with maximum surcharge of HW/D equal to or less than 2.0 (surcharge of one pipe diameter) if Site conditions permit, otherwise size for 200 year event with HW/D equal to or less than 1.0.

4.5.6 Road Alliance Works – Off-Site

The Participants is responsible for the following off-Site roadwork:

Upgrades to the TransCanada and Herd Road intersection to add a new westbound left turn lane at the Herd Road and TransCanada Highway intersection. Upgrade the signal controls and infrastructure as required to accommodate the new left turn lane and signal operation.

b) Temporary improvements to the Bell McKinnon Road and Herd Road intersection to enable WB-20 vehicle access southbound on Bell McKinnon Road during hospital Construction.

c) The permanent, single lane roundabout at the Bell McKinnon Road and Herd Road intersection. Completion to be concurrent with substantial completion of the hospital. The roundabout design will include the following elements:

Curb and gutter in the ultimate build-out location.

A temporary 2.0m sidewalk behind the curb. Sidewalk width measured from the face of the curb. Sidewalk structure to be 150mm base and 60mm asphalt. Sidewalk to connect with walkable shoulders on Herd Road and Bell McKinnon Road.

Signed and marked crosswalks on all legs of the roundabout.

iv) Design of the ultimate boulevard, bike lane, sidewalks and right-of-way limits.

Construction of the following frontage improvements on Bell McKinnon Road for the full length of the Site frontage. The vertical profile shall be Designed to include a smooth grade line with gradual changes:

Existing ditch;

1.2 meter paved shoulder;

3.5 meter travel lane;

3.5 meter travel lane;

2.5 meter parallel parking lane;

Concrete curb and gutter;

2.0 meter grass boulevard;

2.0 meter cycling lane;

2.65 meter sidewalk;

x) A northbound multi-modal transit hub north of Hospital Road South, including an illuminated transit shelter, seating and bicycle racks;

A mid-block crosswalk between Hospital Road North and Hospital Road south, connecting with the future laneway on the west side of Bell McKinnon Road;

xii) Transit hub to align with BC Transit requirements and is to include the following elements:

- Concrete bus pad;
- Bus stop pole;
- Illuminated transit shelter;
- Seating; and
- Bike racks.

The Transit hub is to be located on northbound Bell McKinnon Rd, north of the Bell McKinnon Rd and Hospital Road South intersection.

xiv) Participants are required to provide an optional alternate transit routing along Hospital Road South and Hospital Road North and through the site with a bus stop located near the Emergency Department and the Main Entry.

e) Construction of the following frontage improvements on the north and south Site boundaries from Bell McKinnon Road to the eastern terminus. From the existing property line to the future property line:

i) 1.0 meter paved shoulder;

3.5 meter travel lane;

3.5 meter travel lane;

iv) 2.5 meter parking lane;

concrete curb and gutter; and

2.0 meter sidewalk.

Hospital Road North to be constructed such that a WB-20 vehicle can enter from Bell McKinnon Road, access the Loading Dock and exit onto Bell McKinnon Road.

g) Existing overhead utilities shall be located underground on all frontage improvements.

h) Controlled intersections at Bell McKinnon Road and Hospital Road North and Hospital Road South.

i) Construction of driveway access letdowns on the north and south boundary roads.

Participants will incorporate visual surface changes that allow for delineation of cyclists, vehicles, pedestrians and larger truck traffic routing at accesses and intersection (for example, green cyclist conflict zone surface treatment).

k) Participants to provide an option for transit routing along Hospital Road North and Hospital Road South.

Construction of the following cross section on Bell McKinnon Road from the north site boundary to the Bell McKinnon Road and Herd Road intersection:

Existing ditch or boulevard;

1.2 meter paved shoulder;

3.5 meter travel lane;

3.5 meter travel lane;

1.2 meter paved shoulder;

Existing ditch or boulevard.

4.5.7 Streetlighting – Off-Site

Off-Site street lighting illumination levels and other related operations characteristics will conform to the respective municipal Standards. In order to achieve this, relocation of existing lighting and additional off-Site lighting are both to be expected and to be required.

.2 Streetlights are to be positioned on municipal roads as required by Municipality.

Street lighting shall be Designed according to dark sky principles and all fixtures shall be shielded or full cut-off with no up-lighting to preserve night sky viewing.

4.6 Site Infrastructure (Division 33)

4.6.1 General

Design and construct all on-Site servicing to meet or exceed the Design and quality requirements for the corresponding municipal off-Site services and to meet the needs of the Facility.

4.6.2 Sanitary Sewers – On-Site

Provide sanitary sewers of a diameter, grade and depth to safely convey all effluent from the Facility. The sanitary sewers shall gravity drain to the municipal system. The sanitary sewer system will include the pipes, manholes and all other required appurtenances to comply with applicable municipal and provincial Standards.

Sanitary sewer should not be beneath Buildings, foundations, and permanent structures. Sanitary sewer shall be far enough from Buildings, foundations or permanent structures that following substantial completion the sewer can be excavated with an open trench with 1:1 side slopes.

Not used.

.4 Not used.

Not used.

4.6.3 Storm Sewers and Drainage – On-Site

Storm water modelling and analysis to be completed as described in the municipal standards and account for the effects of climate change by incorporating adjusted rainfall volumes into the drainage analysis.

.2 Provide storm sewers, storm sewer management strategies and a drainage system to safely manage and convey all storm water on-Site to the retention Facility then the municipal system. Site drainage shall employ a system of storm water management features which reduce the Site's effective impervious area to a maximum of 10%.

Not used.

Provide an on-Site storm water management system Designed to meet the Municipality's requirement for storm water quality.

.5 Storm water quality: Comply with the federal / provincial land development guidelines and Stormwater planning: a Guidebook for British Columbia.

The Participants will ensure that neighbouring properties are protected from flooding and nuisance runoff issues and existing municipal system capacities are not exceeded.

.7 Provide adequately sized water quality / sediment control components to meet or exceed the discharge requirements of the Municipality of North Cowichan.

.8 The Participants must employ on-site storm water management strategies which result in no net increase in peak storm water discharge rates up to the 5 year recurrence interval event. Flows in excess of the 10 year storm event are to be controlled and directed via overland flow routes off of the Site.

.9 It is preferred that the lower floor level, loading bay areas and foundation drains are gravity drained into the storm system. Provide permanent pumping if required.

The Loading Dock catchment area shall be minimized through Site grading and interceptor catch basins at top of ramp to loading area.

.11 Provide an underground containment tank for runoff from the Heliport. Tank shall be capable of holding fuel, fire suppression foam and water. Tank shall be sized to contain 100% of the fuel volume of the largest helicopter that can use the heliport and the volume of fire suppression foam discharged in 10 minutes.

.12 Heliport containment tank to have an access manhole for sample collection and a connection for pumping out. Containment tank to be in a location that a pumper truck can park in the parking lot without obstructing traffic or hospital operations.

.13 Heliport containment tank to include an overflow route and berming to prevent environmental damage or risk to public safety in the event of the tank overflowing.

.14 Service spaces and any occupied spaces that are at the same elevation as the lowest point of the Loading Dock area shall be raised 200mm above the lowest point.

.15 Storm sewers should not be beneath Buildings, foundations, and permanent structures. Storm sewers shall be far enough from Buildings, foundations or permanent structures that following substantial completion the sewer can be excavated with an open trench with 1:1 side slopes.

4.6.4 Green Infrastructure – On Site

Incorporate green infrastructure solutions as part of the overall stormwater management strategy to help meet municipal, provincial, and federal requirements and guidelines for stormwater management. (See Section 4.6.3 Storm Sewers and Drainage On-Site).

.2 Include a stormwater wetland in the low part of the Site at the south-west corner.

Integrate the stormwater wetland into the overall Site Design as a natural amenity feature, showcasing locally adapted and appropriate wetland, emergent, and shoreline vegetation.

.4 Design planting at the stormwater wetland considering Indigenous plants, visual interest, seasonal colour, and pollinator friendliness as part of the overall Design.

.5 Connect the stormwater wetland to the Site with a 3.0 minimum width pedestrian pathway, with bench seating at regular intervals for patients, staff, and visitor enjoyment.

Provide an amenity feature for views and enjoyment of the wetland.

Include a bioswale to convey and infiltrate stormwater from the parking lot to the stormwater wetland along the southern landscape buffer, working with the natural grades. Bioswale should not allow standing water. Use rock, naturalized weirs to slow down water and reduce runoff.

4.6.5 Potable Water – On Site

Provide two separate water service connections, complete with ancillary components. Each service shall be independently capable of providing all required demands and firefighting capacity and redundancy for the Facility.

.2 The Facility water service connections shall include metering and backflow prevention. The primary and secondary water services are to be 200mm diameter pipes connected to the looped water main.

.3 The provision of on-Site pumping of the water services will be determined by the municipal system pressures, the final Building floor area and the Building height.

.4 Firefighting volumetric demands are to be calculated using the Fire Underwriters Survey (FUS) method.

If required to meet the FUS fire flow demands, the Participants will provide back-up, permanent fire-fighting equipment.

.6 The water services will include approved backflow preventers to protect the municipal system and on-Site facilities from contaminants.

.7 For the purposes of redundancy, one of the water services to the Facility will operate as a secondary connection to the municipal water system.

Both water main services, from separate off-Site connection points are to converge into a common mechanical room, wherein metering and splitting off of fire suppression flows will occur.

Water mains and services routes shall not be beneath Buildings, foundations, and permanent structures. Water mains and services routes shall be far enough from Buildings, foundations or permanent structures that following substantial completion the mains can be excavated with an open trench with 1:1 side slopes.

Fire Hydrants are to be provided on Site to meet the BC Building Code Requirements.

4.6.6 Road Alliance Works – On-Site

Design and construct on-Site roadways, including the pavement, curbs, gutters, sidewalks, signage, pavement markings, and traffic calming devices that are accessible and wheelchair friendly. Provide safe passage between parking areas, loading areas, emergency vehicle areas and drop off areas without requiring the driver

to enter the municipal roadway. The minimum roadway width for 2-way traffic is 7.0 meters.

.2 All roadways will accommodate fire truck access in accordance with the requirements of the Municipality of North Cowichan's fire department or municipal bylaw requirements.

Design vehicle for Loading Dock access and egress to be a WB-20.

All internal roadways must safely accommodate the largest fire truck in use by the Municipality.

.5 Internal Site truck movements will be Designed such that loading bays are easily accessible, limiting the requirement for truck manoeuvring into and out of loading bay areas.

.6 Use Site surfacing materials which will meet intended use and minimize the heat island effect, where possible. Concrete should be used on the Loading Dock, fuel filling area and propane filling area.

.7 Participants are to provide an option for transit routing through the site between Hospital Road South and Hospital Road North, including an illuminated transit shelter, seating and bicycle racks.

4.6.7 Street Lighting – On-Site

Provide lighting for on-Site roadways, walkways and parking areas to ensure safe vehicle and pedestrian traffic with respect to collisions, personal safety, and Building access/egress. Lighting will be sympathetic to any existing or future Buildings at each Site, as well as all neighbouring properties. All Site lighting to be 'dark skies' compliant.

Refer to Electrical Specifications for detailed on-Site lighting specifications.

5 BUILDING DESIGN REQUIREMENTS

5.1 Adaptability and Flexibility

5.1.1 The Participants will:

Provide a Building systems, services and components that will accommodate changes to use, function and equipment with minimum required changes or interference with the Building's structure and Building systems.

Locate permanent Building elements, such as stairs, elevators and duct shafts, to maximize unrestricted clinical planning areas and minimize planning constraints on changes to the Facility.

Minimize the number of interior structural columns for ease of planning and re-planning of care areas.

.4 Minimize the placement of structural shear walls in interior areas.

.5 Locate the vertical and horizontal distribution of electrical and mechanical services to maximize free floor area for clinical planning requirements.

.6 Accommodate the vertical and horizontal distribution of electrical and mechanical services to allow maintenance and changes to occur with the least disruption to clinical service delivery, especially in areas such as, the Emergency Department, Medical Imaging, Perioperative Services and ICU/HAU.

.7 Provide service access points to Building service systems in key locations in critical care areas so that service disruption is minimized.

.8 No electrical or water lines to be embedded in concrete slabs.

.9 Provide a cable tray system to allow for easy servicing and access.

Do not use raised access flooring.

.11 Standardize the Design and layout of recurrent room types. Refer to Schedule 2A Clinical Specifications for complete list of standardized rooms.

.12 Provide excess capacity (Refer to Section 7) in vertical and horizontal distribution shafts and plenums to accommodate service system improvements, new equipment and current and future technologies.

5.2 Expandability

5.2.1 The Participants will:

Locate primary circulation corridors and exit stairs to allow expansion without increasing the complexity of the circulation system as a whole; and

.2 Provide floor component zoning that allows for expansion of programs and services, for example, by locating administrative or other non-clinical functions adjacent to clinical areas that are likely to expand.

Refer to requirements for Master Site Plan expansion for future Building and Site expansion Section 4.

5.3 Catastrophic Event Management

5.3.1 In undertaking the Design, the Participants will consider the need to protect the life and safety of all Building occupants and the need for continuing services following an earthquake or other disaster, including extreme weather event, epidemic, chemical spill, extended power interruption and contamination or loss of water supply. Design will address maintaining systems critical to patient care such as water supply emergency generators, Heliport systems, transformers, service connections and transportation connections.

5.3.2 Design and construct the Buildings, generators, transformers and service connections, structure, structural components, non-structural components, anchorages, and equipment to post disaster Standards as defined in the BC Building Code.

5.3.3 Design and construct essential services servicing the Facility including the electrical system, steam, domestic water and medical gases to post disaster Standards as defined in the BC Building Code. Locate these services in utilities enclosures that meet post disaster Standards as defined in the BC Building Code.

5.3.4 Design and construct the Building so that it is capable of meeting its functional requirements, for lights, power, data, gas, water and sewer (for a minimum period of 72 hours for power) following a natural disaster or other incident. Additional storage tanks are not required for potable water as water will be trucked into the Site.

5.3.5 See Section 7.1.4 Catastrophic Event Management for mechanical post disaster requirements.

5.3.6 See Section 7.6.3 Post-Disaster Design Criteria for electrical post disaster requirements.

5.3.7 Design and construct the Facility so that it includes an exterior area capable of accommodating temporary tents in case of a mass casualty event requiring the decontamination and treatment of patients (the "Mass Casualty Tent Area").

5.3.8 The "Mass Casualty Tent Area" must be adjacent to the Emergency Department and have exterior water, oxygen, power, and communication hookups located in a kiosk.

5.3.9 Design and construct the Site to support a supplied and installed emergency communications antennae tower. Refer to specific requirements in Section 7.

5.3.10 The Participants will Design and construct the Building so that it includes a command centre for coordinating emergency services in response to a major disaster. Refer to component OS-GP-01 Central Education and Conference Facilities in Appendix 2A Clinical Specifications.

5.3.11 Provide a Meeting Cluster Area that is capable of being used as an Emergency Operations Centre (EOC) during an emergency The EOC will:

Be located in a post-disaster structure on a floor at grade with minimal glazing to the exterior.

Be located so that it is accessible directly from the exterior with a dedicated door as well as from the interior.

.3 Be Designed so that the Communications Centre has the potential to be segregated from the main EOC operational area to minimize noise.

.4 Have Storage -EOC room for emergency communications equipment.

.5 Provide a high density of power outlets to accommodate the equipment identified in this section, plus additional outlets to support operational flexibility and adaptability.

.6 The Meeting Room -Large -EOC will be sized to accommodate 40 seats and will:

be able to be subdivided into two meeting rooms of 20 seats each by a full height, sound isolating operable partition (electronically controlled) capable of being used as a whiteboard on both sides in a closed position complete with access man doors.

.7 The Meeting Room -Large -EOC will be located:

adjacent to a Video -Conferencing & Communication Equipment Room capable of supporting the Communications Tower systems and equipment;

near a locked supply storage area (complete with power and network outlets for charging equipment);

c) near a separate EOC-Radio Room capable of supporting the Communications Tower systems and equipment. Refer to Section 7.7.30

;

adjacent to a food preparation area; and

close to staff shower and change facilities in the Building.

The Meeting Room -Large -EOC will:

have a multifunction printer/scanner/fax machine with 2 fax lines (one for outgoing messages and one for incoming messages) that are both Telus 1B lines (which are in addition to the Telus 1B lines described in Section 7);

have 5 multifunction display/whiteboards on Vital and UPS power;

have teleconferencing and videoconferencing capability; and

have 4 wall-mounted displays with cabling to support viewing and monitoring of internet and cable TV news channels.

.9 The Video Conferencing & Communication Equipment Room will have two workstations; each workstation will have:

4 power outlets (2 on Vital, 2 on UPS);

3 telecommunications outlets;

2 Telus 1B phone lines; and

d) Satellite phone capability for each of the Telus 1B phone lines.

.10 The Storage -EOC room will have charging shelves and receptacles for the following:

a) VHF Radio System, consisting of 1 digital antenna and 1 voice antenna;

HF Radio System, consisting of 1 digital antenna and 1 voice antenna;

Satellite phone system;

d) Commercial Radio System; and

FMO/PS Radios.

5.3.12 The sheltered ambulance bays will be Designed to act as a post disaster receiving area with mechanical and electrical services as described in Section 7.

5.4 Architecture

5.4.1 Building Form and Character

The architecture of the Facility will be iconic for the surrounding neighbourhood and set a civic Building Design precedent for a health care Facility in the community. The Facility Design will illustrate Island Health's corporate values and demonstrably promote healthy living, community relations and sustainability.

.2 The Facility character will be perceived as welcoming, understandable, accessible and effective by the public it serves.

It is acknowledged that the Site is in the traditional territory of the Cowichan Alliance and this understanding will be reflected in the Design of the campus and the Facility demonstrating culturally appropriate references to Indigenous communities.

.4 The Facility will consist of two masses that are directly connected by spatial adjacency and by Building services. There will be an Inpatient Unit (IPU) Tower and a Diagnostic and Treatment (D&T) Block.

The Inpatient Unit Tower will contain the following functional components:

General Medical/Surgical Units;

Perinatal & Pediatric Inpatient Unit;

c) Psychiatric Inpatient Unit;

Public Main Entry, Gift Shop, Registration;

Cardio-Pulmonary Diagnostic Services; and

Additional clinical and non-clinical support services.

.6 The D&T Block will contain the following functional components:

Perioperative Services (including Ambulatory Care Procedures);

Medical Device Reprocessing Department (MDRD);

Intensive Care / High Acuity Unit (ICU/ HAU);

Emergency Department (ED);

Medical Imaging;

Restorative Health Acute & Ambulatory Care Therapy Services; and

g) Additional clinical and non-clinical support services as required.

.7 The Facility Design will demonstrate the following features:

The Building form will be articulated and detailed to ensure the Building envelopes are robust.

b) Utilize glazing to optimize occupant comfort, views and daylight penetration, and to reduce energy consumption through day lighting, solar heat gain in winter and minimized envelope thermal losses.

Consider using exterior shading mechanisms such as louvers or fins to reduce overheating interiors by direct sunlight and to reduce energy consumption required for cooling. Provide glass with improved window performance for these Building elevations with U-value and Solar Heat Gain Co-efficient to reduce overheating interiors by direct sunlight and to reduce energy consumption required for cooling.

d) Roof top mechanical / electrical equipment to be enclosed within a mechanical penthouse and incorporated within architectural cladding elements, and consistent in form, and detail with the rest of the Building.

Roof top and on Site mechanical / electrical equipment will be provided with noise attenuation in Section 7.1.5. Refer to Section 4.3.7 for db levels.

5.4.2 Exterior Building Materials and Colour

Vertical exterior materials on the Building will be high quality, durable finished materials suitable for a 50 year Building lifecycle.

Roofing materials for the Building will be high quality, durable finished materials suitable for a 25-30 year Building lifecycle.

Roofing systems will be Designed to be completely watertight with drainage to prevent water accumulation on the roof. Sloped roof assembly will be installed with underlayment to intervene and drain the incidental water entry past the finish material.

.4 Roofing materials and vertical exterior materials on the FMO maintenance compound will be high quality, durable finished materials suitable for the function.

Cladding and exterior glazing will be Designed with robust detailing, applied in a rain-screen fashion and suitable to withstand future climate change demands.

Cladding and roofing systems will maintain envelope performance during extreme weather conditions and major catastrophic events according to manufacturers' recommendations.

.7 Cladding materials may be: architectural concrete, brick or stone masonry, glass, phenolic panels, ceramic cladding, and aluminum composite panels.

Glue laminated wood and flat cross laminated timber may be used as exterior structural elements as long as they are treated for weathering, with flashing on surface elements where moisture can land and not exposed to the climatic elements.

.9 The use of vinyl siding, Hardie plank, stucco, EIFS acrylic stucco, insulated metal panels, mirrored glass and large expanses of plain unfinished concrete is prohibited on the main Building, except for insulated metal panels or metal cladding for penthouses and Service Centre exterior walls.

The Participants will minimize the number of exterior cladding materials to reduce the number of envelope joints. The envelope system will incorporate durable materials with ability to allow differential movement at the joints.

.11 Wood used on the exterior is to be selected, located and treated to minimize ongoing maintenance and optimize its life span. Wood is to be physically located to optimize easy access of ongoing maintenance.

.12 Wood on the exterior is to be used adjacent to the main entry at pedestrian level.

5.4.3 Roof Assemblies

Roof Assemblies to be Designed and installed per the RCABC guidelines.

.2 Roof assemblies to be Designed and installed to meet the dynamic wind uplift requirements of CSA A123.2 and per Heliport requirements.

No loose materials, landscaping or other "green" treatments on roof below Heliport. Roof area below and area within a 6m radius surrounding Heliport to be engineered to withstand uplift from rotors.

.4 Provide stair access to all major roof areas larger than 100m2 with ladder access to smaller roof areas only.

.5 Provide access from two exit stairs for Heliport use.

.6 Use of roof hatch accesses to be approved by ALT.

.7 Provide service elevator access to all mechanical penthouses to service equipment.

.8 No requirement for high parapets for regular roof access for maintenance by operational staff.

Provide roof hatch access 1.8m away from the roof perimeter.

There will be a requirement for fall prevention where required by the Owner's operations and WorkSafe BC.

Permanent fall arrest anchorage and connection points as required by the Owner's operations.

.12 Light coloured roof materials to be provided in areas which receive sunlight throughout the day. Darker colours may be used in other areas where moisture can accumulate without daytime evaporation of surface.

.13 Complete roof drainage of standing water must be achieved through roof Construction slope Design. Minimum slope required, including valleys, is 2%.

.14 Roof areas adjacent to air intakes must not contain standing water.

.15 Any roof exposed at main floor level to be landscaped with a patio and/or raised planted areas and any roof that is to be used as part of a Secure Outdoor Space will be landscaped.

.16 Roof membrane upturns at all penetrations and terminations will be minimum 200mm off the drainage plane.

.17 Roof area dividers will be installed to contain and drain water effectively.

.18 Roof perimeter curbs will be installed with roof curbs at all locations.

.19 Sheet metal flashing to be installed with a minimum 6% slope towards the roof.

.20 Overflow scuppers to be installed at all roof areas except where roof curbs are less than 89 mm above the drainage plain.

.21 Mechanical equipment heavier than 90.7 kg (200lbs) or over 105PSF point load will be mounted on curbs.

.22 Mechanical equipment less than 90.7 kg (200lbs) or over 105PSF point load if floated on roof membrane will be protected with polystyrene insulation with adequate compressive strength.

.23 Inverted roof assemblies to be installed with ballasts that are sized to provide adequate load to restrain the floating of insulation and resist wind uplift.

.24 Inverted roof assemblies with concrete faced insulation will not be installed.

.25 Mechanical and electrical conduits, ducts and pipes to be installed on top of neoprene pad supports.

.26 Walkway pads, pavers or membrane strips will be provided for maintenance.

5.4.4 Building Day Lighting

Provide direct access to daylight and views in:

All inpatient bedrooms;

Patient treatment spaces as appropriate;

Patient lounges; and

Main entry lobbies.

.2 Provide access to daylight and views in:

Clinical patient waiting areas;

Teamwork areas;

Staff lounges; and

Conference and meeting rooms.

In general, window size to be consistent with Project sustainability objectives and space utilization.

.4 Maximize glazing size in inpatient bedrooms. Minimum size 1800mm height x 1500mm wide.

Maximum sill height from floor in inpatient rooms to be 600mm to allow for view from patient bed in prone position.

Consider using external shade and provide glare control at all windows that experience any sun penetration during all times of the year.

.7 All inpatient rooms will have roller shades covering the exterior window from the inside of the room.

One operable window in each inpatient bedroom will be an operable window with restricted opening size of 110mm. No operable windows permitted in Airborne Isolation Rooms.

.9 Psychiatric inpatient, PICU and Secure rooms will use a thermal ventilator window with a trickle vent or approved equivalent.

.10 All principal horizontal public circulation routes will include direct natural light and access to views in the form of windows.

5.4.5 Glare Control

The Participants will Design and construct the Facility so there is minimum glare in all regularly occupied Building areas.

.2 The Participants will Design and construct the Heliport control area so there is no glare to interfere with operations. Refer to Section 5.13 for detail requirements.

.3 The Participants will provide glare control and minimize heat gain with the provision of sunshades and other solar control measures at windows facing the sun throughout the day and year at any time of day.

.4 The Participants will provide a glare and heat gain control strategy, through Building form and layout and Building Design measures such as:

Integrated Building Design measures such as overhangs or Projections;

External shading or brise soleil;

High performance window glazing composition, and low E coatings; and

Occupant control devices such as internal blinds.

The use or location of shading should not conflict with the operation of lighting control systems.

External and/or integrated measures are required to control glare and heat gain in addition to interior solutions.

5.4.6 Building External Entrances

Building Entrances

a) All entry doors into the Building from the exterior will be protected from snow and rain by canopies or Building overhangs.

Provide wind protection at Building entrances exposed to prevailing winds. Orient Building generally to minimize wind induced by adjacent Buildings on Site.

c) Entryways must be illuminated to allow safe entering and exiting.

Vestibules

Entrance vestibules will provide complete transparency from the exterior to the interior, and from the interior immediately in front of the vestibule on the exterior.

Entrance vestibules will be configured and sized in order to preserve an airlock effect for climate control. Ensure a minimum 3 metre distance between the sets of doors to allow stretchers and wheelchairs to fit lengthwise into the vestibule with the exterior doors closed.

c) Provide a heated air curtain system over the exterior doors to control the temperature loss during winter months.

Provide Staxi transport chairs and wheelchair alcoves visible and accessible to the main entry vestibules.

Exterior Doors

Use sliding doors at all public entrances. Use doors that can be activated by handicapped accessible push-button controls located on the inside and outside of both sets of doors.

Doors will be configured for push-pull manual operation in addition to automatic operation.

c) Entrance doors to/from the Emergency Department, patient transfer entry and to/from the Heliport will be sufficiently wide (min clear 1800mm opening) to allow access for stretchers surrounded by medical staff.

5.4.7 Building Envelope

Utilize a Building envelope professional (whose credentials as a Building envelope professional are recognized by the Architectural Institute of British Columbia or the Association of Professional Engineers and Geoscientists of British Columbia) to advise on Building envelope Design and Construction.

.2 Design and construct the Building envelope to withstand climate change for the next 50 years in the Cowichan Valley. Utilize the latest climate change information and resources to inform the Design and Construction provided by the Owner.

.3 Complete the Design and Construction so as to prevent the accumulation and stagnation of rain, snow, ice and dirt on the horizontal and vertical surfaces of the Building envelope(s) appropriate for the climate in which the Facility is situated.

.4 Complete the Design and Construction so as to prevent both the ingress of exterior moisture and the trapping of condensation from infiltrating humid air within the envelope for a 50 year lifecycle.

Design exterior walls in accordance with the 'rain-screen principle'.

.6 Ensure that materials and systems of the wall and roof assemblies contribute to reducing heat gains and losses with minimal decline in performance over their expected lifespan.

.7 Ensure continuity of the air barrier, vapour retarder, thermal barrier and water resistive barrier across the entire envelope.

Design Building envelope details to prevent thermal bridging. Canopy and other Projected Building structural elements to be Designed to thermally break structural elements that Project or attach within and outside Building envelope.

.9 Design Building envelope so that the inside of patient rooms exposed to noise from hospital related equipment, delivery / loading bays, emergency intake areas, and busy road traffic areas are exposed to noise levels:

less than 30 dBA from steady sources of noise such as HVAC equipment and transformers;

less than 45 dBA for noises associated with brief intermittent events (sirens, loading bay noise events); and

are protected from helicopter noise levels as recommended by acoustical consultant for patient rooms exposed to helicopter flights.

.10 Provide removable openings for MRI unit replacement and future expansion as part of the envelope Construction for the Magnetic Resonance Imaging Room and area.

Provide removeable openings in Penthouses for major mechanical and electrical service replacement and access.

.12 Where required provide spatial separation and buffer zones for areas such as Loading Dock and associated Environmental Service rooms opening onto the Loading Dock by detailing an interior wall as an air and thermal barrier, and provide vestibules in the service circulation corridors to separate the exterior Loading Dock area from the interior space.

.13 Provide vestibules at all entries to the Building.

.14 The Participants will meet the minimum B.C. Energy Step Code targets and will follow the requirements of Section 2.4 Infiltration in the City of Vancouver Energy Modelling Guidelines Version 2. These requirements will be confirmed through mandatory air tightness testing.

5.4.8 Interior Walls and Partitions

Use interior walls and partition systems that provide acoustic separations as required for the specific functions to be carried out in the spaces affected, and in accordance with the requirements of CSA Z8000.

.2 Design and select interior walls and partitions, partition systems and interior finishes to comply with the following criteria as may be relevant for the particular or specific functions enclosed:

cleaning, maintenance and infection prevention and control;

compatible with the Owner's disinfectant products, including those that contain accelerated hydrogen peroxide, quatemary ammonia, bleach and alcohol;

permanence and durability including impact resistance; and

low VOC emissions so as to minimize adverse impact on indoor air quality and indoor environmental quality.

.3 All interior partition walls to go from floor to underside of slab, except in areas that are unrated according to code and where sound transmission requirements can be achieved through alternative measures in non clinical areas.

In the Psychiatry Inpatient Unit, PICU and the Psychiatric Evaluation and Stabilization Zone (P.E.S.) in the Emergency Department construct the walls to suit the purposes unique to those areas in compliance with the British Columbia Ministry of Health Standards for Hospital-Based Psychiatric Emergency Services: Observations Units.

.5 Interior partition in Airborne Isolation Rooms, ante rooms and pressurized rooms must be Designed and constructed to meet the specific pressure requirements for such rooms. Refer to CSA Z8000 and CSA 317.2.

.6 Provide wall finishes that are smooth, seamless, washable, waterproof, durable, in all wet areas, including Operating Rooms, Procedure Rooms, clean and soiled utility rooms, housekeeping rooms and MDRD rooms.

.7 Provide wall and partition Construction that provide protection from cart and stretcher traffic damage in all Food Services areas, Materiel Management, Equipment Depot, Environmental Services, service corridors, and MDRD rooms, and as follows:

Provide impact resistant gypsum board up to 900 mm above finished floor height;

Provide stainless steel bumper rails; and

c) Provide stainless steel corner guards.

Provide fittings, attachments and internal bracing/backup as required to accommodate and support wall mounted equipment. Ensure any exposed fittings and attachments are easily cleaned, with smooth surfaces and minimal cracks or crevices, and are compatible with disinfectants used by the Owner.

.9 Provide fully sealed stainless steel corner guards at all corner wall intersections and at other locations where service, supply, patient transfer, (i.e. carts, stretchers, beds) and equipment traffic occurs.

Provide for the Pharmacy narcotics vault in accordance with Pharmacy Construction standards.

5.4.9 Interior Glazing

Provide either door sidelights and glazing in all doors consistent with the space use to increase daylight within interior spaces.

Provide interior curtainwall systems and interior glazing frames with 25 mm frame profile.

Provide door sidelights in the following spaces:

Conference rooms;

b) Meeting rooms;

Offices, private and shared; and

d) Workrooms.

.4 Provide privacy film with a grid of opaque dots on interior glazing where required by functional and clinical requirements.

5.4.10 Doors and Frames

Provide doors with standard profile frames.

Provide all doors and door frame edges with protection in cart, beds and stretcher path of travel.

Doors and frames shall be large enough to accommodate staff, public, equipment and patient stretcher transfers.

Doors and frames into patient rooms should be large enough to accommodate patient bed movement including medical equipment. Pair doors with one door minimum 1000mm. Provide a minimum 1300mm clear opening measured from face of open door to open door face to patient bedroom. Provide 1050mm washroom door.

.5 Provide 100mm x 300mm glazing in General Medical/Surgical inpatient bedroom doors, Perinatal & Paediatric Inpatient Unit bedroom doors and MHSU bedroom doors. The glazing will be at eye level to allow staff to see the head of the bed. The window will have integral blinds.

.6 Provide fully sealed stainless steel door protection from bottom of door to 600 mm above finish floor level in inpatient bedroom door.

.7 Refer to Section 6.9 Openings for detail door requirements.

Provide a door width of 1220mm in addition to a 305mm side leaf for Bariatric bedrooms, washrooms, shower/tub rooms to allow for adequate clearance and manoeuverability for staff when transferring Bariatric patients in stretchers or beds.

.9 Provide clear door opening width of minimum 1500mm in any Bariatric path of travel.

Provide automatic slider doors at all main entries to Facility.

.11 Provide double doors for those areas that house larger equipment that will need repairs or maintenance or will need to be removed and replaced, including general storage, workshops and physical plant service space.

.12 Provide trackless, 3 panel breakaway doors for ICU/HAU, Trauma Rooms, Operating Rooms specified in Section 6. Provide hardware which allows doors for pressurized rooms to maintain pressurization of rooms when closed.

.13 Coordinate doors, frames and hardware with security systems, electrical systems and Building operations systems to ensure operational requirements and access controls are provided according to Owner's operational requirements.

.14 Coordinate and install access controls, card readers, intercoms, and override switches and request exit devices as required for the Owner's operational requirements.

5.4.11 Ceilings

Ceiling systems will comprise a major component of the acoustic or sound attenuation function as required in the spaces in which they are installed and will comply with the requirements in CSA Z8000 and all other applicable provisions in this Schedule 2. Refer to Appendix 2I Room Finishes Matrix.

.2 Ceiling height will not be less than 2750 mm in all areas of the Building except for the following:

Psychiatric Patient Room - Seclusion rooms will have a minimum ceiling height of 3000 mm;

Ceiling heights in rooms with ceiling mounted or overhead equipment will be based on specific equipment requirements including ceiling lifts but no less than 2750 mm or 3000mm in Psychiatric Inpatient rooms;

c) Ceilings in mechanical, electrical, plumbing, and telecommunication rooms will be open, unless required otherwise by code to meet fire ratings;

Public Lobbies will have a minimum ceiling height of 3600 mm;

Gathering/Sacred Space ceiling height will be determined through consultation;

The sheltered ambulance bays will have a minimum ceiling height of 4500 mm;

Operating Rooms, Medical Imaging rooms, and rooms with overhead patient gantry lifts (except inpatient rooms) to have a minimum ceiling height of 3000 mm. Refer to Appendix 2M Patient Lift Matrix for list of gantry lift locations;

h) Provide open ceilings in Materiel Management Storage Room – Bulk area (except for Storage Room – Clinical Supplies), and Facilities Management & Operation shops;

Ceiling height in public corridors and service corridors will be not less than 2750mm;

j) Ceiling height in all washrooms to be a minimum of 2400mm; and

Ceiling height in storage rooms to be a minimum of 2400mm unless required by functional and storage shelving requirements.

Suspended structure located for mounting and supporting overhead equipment will be located above finished ceiling.

.4 Ceilings will allow access to equipment where necessary. Coordinate access panel locations with IPAC requirements in patient care areas.

Exposed Building services are not permitted in lobbies and patient accessible areas.

.6 Ceilings in public areas and Patient common areas will be Designed to avoid plain and featureless ceilings. Ceilings in these spaces will use feature materials and provide visual Design interest.

.7 Provide washable, impermeable, monolithic, painted gypsum board ceilings in the Central Kitchen Facilities and Ware washing areas of Food Services.

.8 Provide washable impermeable, monolithic, painted gypsum board ceilings in Morgue, MDRD, Operating Rooms, clean and soiled utility rooms, and Procedure Rooms. Refer to Appendix 2A Clinical Specifications for complete list and Appendix 2L Room Finishes Matrix.

.9 Provide ceilings compatible with the Owner's disinfectant products, including those that contain accelerated hydrogen peroxide, quatemary ammonia, bleach and alcohol.

.10 In the Psychiatry Inpatient Unit, and the Psychiatric Evaluation and Stabilization Zone (P.E.S.) in the Emergency Department, construct the ceiling to suit the purposes unique to those areas in compliance with the British Columbia ministry of Health Standards for Hospital-Based Psychiatric Emergency Services: Observations Units.

Participants to provide ceiling access plan for service access points. Ceiling tiles to be colour coded with small dots for the Owner's operational requirements.

5.4.12 Patient Lift Tracks

.1 Patient lift tracks can be mounted to the underside of the ceiling grid in the inpatient bedrooms not designated for Mental Health. Patient lift tracks will be flush with ceiling in all patient washrooms.

.2 Access into patient washroom with ceiling lift track locating patient directly above and centred on toilet. Centre track in middle of washroom door opening.

5.4.13 Virtual Skylight Ceiling Systems

Provide virtual skylight ceiling systems in internal rooms that would provide a positive distraction for patients undergoing treatment:

Computed Tomography (CT) Room;

Magnetic Resonance Imaging Room; and

c) Fluoroscopy/Interventional Radiology Rooms.

5.4.14 Corridors

Public corridors or where patients will be transported by bed or stretcher will be a minimum of 2400 mm wide clear, except:

in Restorative Health Acute & Ambulatory Care Therapy Services areas corridors will be a minimum of 1800 mm wide to allow for stretcher traffic;

major clean and soiled service supply corridor connecting Materiel Management Loading Dock to service elevators in the D&T Block and Inpatient Tower will be a minimum of 3000 mm wide if it is a single corridor and traffic flows in two directions and 2400mm if there are two corridors with one way traffic flow;

in administrative offices and staff areas corridors will be a minimum of 1500 mm wide; and

in areas where there maybe potential congestion provide a greater width as

required to provide for passing and turning of cart, stretcher and bed traffic.

.2 Provide access to the ceiling plenum for Building systems maintenance only from corridors in clinical areas. Access will be secure and convenient for maintenance staff. If ceiling tiles are used, provide the ceiling tile layout such that access to the plenum requiring a hoarded area in the corridor below will not reduce the clear corridor to less than half its original width.

Provide patient care and treatment corridors with the following:

Corridors in patient care treatment areas and in inpatient units will have alcoves for storage of equipment. The alcoves will be dispersed between patient rooms allowing corridors to be kept clear of equipment and supplies. The alcoves to contain linen carts, supply carts, and blanket warmers as identified in Appendix 2A- Clinical Specification.

b) Corridors in patient care treatment areas and in inpatient units will have alcoves for handwash stations and IPAC supplies as identified in Appendix 2A- Clinical Specification.

Provide the alcoves with power outlets for charging electronics and data ports, each at waist height for ease of access.

Corridors will have recessed rest areas for patients to promote mobility and activity. Alcoves to be every 50m along patient travel.

Alcoves for portable diagnostic imaging equipment and crash carts to be coordinated with the Owner on each floor level. Install power and data outlets sufficient for such equipment.

Alcoves in corridors to be finished with 2200mm height abuse resistant finishes.

.4 All access panels located on corridor walls and ceilings in public and patient accessible areas will be consistent in form, material, and detail with the rest of the adjacent corridor materials and finishes.

5.4.15 Exit Stairs

.1 Locate exit stairs strategically for the convenience of staff moving between related clinical departments and as required by code requirements.

.2 Locate exit stairs conveniently accessible from circulation routes.

.3 Avoid stair locations that negatively impact future planning flexibility or constrain desirable views from patient care and staff work areas.

.4 Provide windows with views to the exterior at each level for orientation and amenity and provide adequate lighting into stairwells for staff security at night.

.5 Provide exposed concrete surfaces in exit stairwells with a smooth formed finish. Fill any depressions or holes to a flush surface. Finish gypsum board surfaces to a Level 4 finish.

Provide tactile indicator nosing strips on each step and at the top of the stairs to indicate level change.

Terminate handrails at wall, post or floor surface.

Provide colour contrasted handrail with surrounding surfaces.

5.4.16 Convenience Stairs

Include convenience stairs where appropriate, located strategically to reduce dependence on elevator use for both public and staff.

.2 Provide convenience stairs that may also function as required exit stairs, approximate to all elevator core locations.

.3 Provide metal convenience stairs to mezzanines.

.4 Provide exposed concrete surfaces in stairwells with a smooth formed finish. Fill any depressions or holes to a flush surface. Paint finish concrete and finish gypsum board surfaces to a Level 4 finish.

.5 Provide tactile indicator nosing strips on each step and at the top of the stairs to indicate level change.

.6 Terminate handrails at wall, post or floor surface.

.7 Provide colour contrasted handrail with surrounding surfaces.

5.4.17 Courtyard Design Principles

Courtyard placement will maximize solar access.

Building materials in the courtyards will minimize glare.

Courtyards will be fully accessible.

Courtyards will have appropriate access for maintenance.

Courtyards will have a minimum clear dimension of 4 metres.

Courtyards will have minimum areas as required by Section 4.3.17 Secure Outdoor Spaces.

.7 Courtyards will have landscape treatments as identified in Section 8.4.

5.4.18 Sheltered Ambulance Bays

The sheltered ambulance bays will be located adjacent to the Emergency Department and have a direct vestibule entry into the Emergency Department.

The sheltered ambulance bays will allow for the parking for 4 ambulance s parked in four lanes with clearance for ambulance stretchers behind each ambulance.

The sheltered ambulance bays will have a separate entry and exit for the ambulance s which does not cross any public circulation route.

.4 The sheltered ambulance bays will contain the disaster supply storage. Refer to Appendix 2A-Clinical Specification.

.5 The sheltered ambulance bays will be used in catastrophic event management and will be Designed with additional mechanical and electrical services as required in Section 7.

.6 The sheltered ambulance bays will contain a Designated clean storage for ambulance equipment and supplies.

.7 The sheltered ambulance bays will contain a decontamination area complete with water supply, hose and drainage.

The sheltered ambulance bays will contain cleaning equipment for the ambulance s, including a hose and drain.

.9 Finishes and surfaces shall be able to be cleaned with hospital grade disinfectants. Manufacturer's cleaning protocols will be compatible with the Owner’s products

including those containing accelerated hydrogen peroxide bleach, alcohol and quaternary ammonia.

.10 Flooring shall be slip resistant in both wet and dry conditions, durable and impervious to oil and grease.

.11 Refer to Section 7 for mechanical and electrical service requirements.

.12 The sheltered ambulance bays will have a permanent roof. The roof extent will cover all ambulance parking bays, areas for patient stretcher unloading and access into the Emergency Department, all storage areas and decontamination areas.

.13 The sheltered ambulance bays will have temporary PVC exterior walls, including exterior windows and access doors. The temporary walls will be able to be removed or rolled up when not in use. The purpose of the temporary walls is to enclose the ambulance bays to use the space for triage or mass decontamination.

.14 The PVC enclosed ambulance sheltered bays space will seal weather, water leakage and airflow from the exterior.

.15 The temporary PVC walls will be rip proof and fire resistant.

5.4.19 Loading Dock

Provide equipment which meets the following Loading Dock requirements:

Exterior raised (1200mm above grade) Loading Dock platform (minimum width 3000mm) directly connected to the Materiel Management component at the same floor level.

Access to Dock through one (1) overhead lift door and one (1) man door.

Provide bumper guards and wall protection.

d) Provide two 1500 mm wide ramps at either end of the Loading Dock platform to grade.

e) Provide two lane exterior ramp to Loading Dock with maximum slope of 10%.

f) Provide four (4) loading bays for semi-trailer trucks (53 ft / 1615 mm); one is dedicated for food deliveries and pick-ups. the other 3 are for linen and laundry, and general supplies.

Provide one (1) loading bay for garbage compactor container and tipper. Allow for space for removal of container and replacement container at the same time.

h) Dock collection area to be directly connected to Materiel Management:

Medical Gas Bottle Storage;

Flammable Storage Room – Clean; and

Flammable Storage Room – Contaminated.

i) Dock Collection to be directly connected to Environmental Services/ Laundry:

Walk in refrigerated Organic Waste Holding Room with dedicated exhausting;

Walk in refrigerated Biomedical Waste Holding Room with dedicated exhausting.

j) Provide one (1) Cardboard Compactor bay and tipper;

The linen bay will have an extended covered Dock area that allows for the marshalling of 20 linen carts.

l) Locate bays to provide a clean delivery zone separated from a soiled zone along the Dock;

Not used.

Provide Trench drainage at lowest point of ramp and at Dock;

o) The Loading Dock will be an external covered area with a minimum 4.267 m (14') high overhead clearance;

p) Provide 3 pit style Dock levelers in each semi-truck bay complete with hydraulic lift system and a push button remote control;

q) Provide each Dock leveler with a minimum lifting capacity of 22,727 kg; and

r) Provide one loading bay with a scissor lift best suited to accommodate a variety of delivery vehicle heights. The lift should have guard rails for when it is lowered so that it does not restrict dock movement of goods and materials.

.2 Provide spaces in the Loading Dock area for the following:

Recycling station and pick up area with room for 3 open topped 6 yard sorting containers (paper, plastic, cans);

Provide 5 parking spots for courier vehicles, one for a cube van and two spots for service vehicles;

c) Provide one parking spot for funerary services vehicle; and

Provide standard pallet storage and broken pallet storage area.

Provide security, lighting, mechanical and electrical services. See Section 7.

5.4.20 Elevators

.1 The D&T Block will have at a minimum two passenger elevators and three service elevators.

.2 The Inpatient Unit Tower will have at a minimum three passenger elevators and three service elevators.

.3 The 4000 lb passenger elevators are intended to serve ambulatory patients, visitors and staff, but are not intended to handle any vehicular traffic other than wheelchairs.

.4 Finishes in the passenger elevators will be in keeping with the interior Design finishes of the public areas of the Building and IPAC best practises.

.5 Provide colour contrasted and graspable handrails in passenger cabs.

.6 Provide mirror in back of cab mounted to assist users in wheelchairs in backing out.

.7 The 8000lb service elevators are to be provided for patient transfer and staff, Food Services and clinical and nonclinical support services, such as Environmental Services, laundry, Pharmacy and supplies.

.8 Restricted access to service elevators will be provided via a card access system. The service elevators are non-standard elevators with very large platform size and door opening to accommodate, carts and other vehicular traffic.

.9 The service elevators will accommodate Bariatric patient beds with associated ventilator and other equipment as well as accompanying staff.

.10 The service elevators are to be Designed in accordance with Code Blue requirements.

.11 Finishes in the service elevators will withstand heavy use and abuse from cart, pallet and bed traffic and align with IPAC requirements.

.12 Two dedicated service elevators (one dedicated clean, one dedicated soiled) will deliver/return case carts and supplies from the MDRD to the Perioperative Services.

.13 Not Used

5.4.21 Pneumatic Tube System

The Participants will provide a 6" diameter computerized Pneumatic Tube System (PTS) suitable for the secure on-demand transport of light materials and healthcare products.

.2 The Participants will provide all necessary transfer units, recessed user stations, carriers and strategically Designed network of tubing.

Refer to Schedule 2A Clinical Specifications for Pneumatic tube station locations.

.4 Plan of tube circulating system and head end area location to achieve the Owner's operational requirements.

5.4.22 Facility Maintenance and Operations Compound (FMO Compound)

.1 The Participants will provide a FMO maintenance compound on the Site. The FMO compound will include a vehicle garage. Not all components of the FMO maintenance compound need to be co-located provided that they are located in and around the Loading Dock maneuvering area and individually secured.

.2 The Construction and exterior cladding of the Vehicle Garage and of the Vehicle Carport is to be a quality consistent with its required function, but is to be in keeping with the general aesthetic appearance for the Site.

The Vehicle Garage will contain:

Two storage bays for landscape and snow removal equipment, including two lawn tractors;

b) One bay for parked service van vehicle; and

c) Storage shelving for equipment and supplies.

.4 The FMO compound will contain Site services infrastructure such as:

diesel storage;

incoming high voltage gear and 2 transformers;

c) 2 FMO garbage containers; and

bulk oxygen equipment.

The FMO compound will be in a fenced and secure area with an electronic operable gate entry. There will be exterior lighting.

The FMO compound will be large enough so that service vehicles can enter and service, refuel etc. the equipment located in the compound without conflicting with other uses of the area.

.7 The FMO compound must be accessible from the Facility Maintenance and Operations component within the Building.

.8 The Vehicle Carport will contain:

Three bays for parked service van vehicles.

5.4.23 Service Centre

The Service Centre will contain the main mechanical (other than HVAC) and electrical services and emergency generators required for the Facility. The medical gas source equipment room will be located in the D&T Block.

.2 It will be located adjacent to Loading Dock in order to receive equipment and equipment replacement. An overhead door sized to accommodate equipment access is required as well as a man door at the Loading Dock level.

If required for maintenance and operations a mezzanine will be provided over one half of the area reached by stairs and a gantry crane.

The floor level of the Service Centre will be raised a minimum 200mm above the lowest level of the Loading Dock to prevent water access.

.5 The main Electrical Room and IMIT server room are to be located proximate to the mechanical room in a location and elevation that prevents flooding or water entry.

5.4.24 Public Space

Services at the Lobby, the patient transfer entry and the Emergency entry should be for the primary use of patients and community.

Information directories and registration kiosks should be located at main entries.

.3 Hand hygiene stations will be located at every entry/exit to the Facility.

.4 The Participants will permit/prevent access to Building retail components in the Lobby such as the Café Bistro through the means of a securable storefront grille.

.5 The Participants will provide public washrooms located in visible, logical locations which include family friendly washrooms with baby change tables. One public washroom will contain an adult change table.

.6 The Lobby must be acoustically treated to control excessive noise or sound reverberation that can prevent effective space communication, facilitate the spread of noise from the Lobby to adjacent noise sensitive interior spaces and / or make spending time in the Lobby uncomfortable.

5.5 Interior Design

5.5.1 Colour

.1 The Participants will:

a) provide departmental color palettes appropriate for the emotional and psychological needs of patients and staff for review;

provide colour palettes that contribute to the creation of a healing environment;

c) provide distribution of ambient full-spectral colour within typical staff and patient environments;

provide colour palettes that supports the architectural and interior narrative; and

provide colour palettes that are selected in consultation with Indigenous Advisory Council.

.2 The Participants will avoid colours that:

interfere with the clinical assessment of a patients' skin;

disorient the elderly or impaired patients;

agitate patients and staff; and

create glare.

5.5.2 Design Feature Elements

Design feature elements will not have devices, signage, ABHR and equipment located on the feature or conflicting with the overall aesthetic

Design feature element locations will be coordinated with all disciplines to ensure the Design feature is not compromised by extraneous and conflicting equipment and services placement, nor impede clinical and safety function.

5.5.3 Interior Building Materials / Finishes

General

Provide interior materials and finishes that:

provide a high-grade durable environment;

are appropriate in terms of aesthetics, quality, scale, durability, colour, and environmental requirements, and are replaceable within reason;

are appropriate for the locality including consideration of noise, vibration, dust, fumes and environmental conditions;

easy to maintain, repair and clean;

resistant to microbial spread and growth;

non-porous and smooth;

constructed in a way that they do no soak up or harbour moisture;

water impermeable in areas where water or dampness may be present; and

compatible with the disinfectant products used by the Owner for environmental cleaning, such that protective coatings will not be removed.

Zoning

Finish application may vary between zones within the Facility: clinical/patient zone, staff zone, and public zone. Each zone may have varying levels of IPAC concerns and should be coordinated with IPAC to ensure the appropriate finishes are applied to meet IPAC standards as well as the Design concept.

Clinical/Patient zone:

is an area where treatment is provided to patients; and

examples include exam rooms, Procedure Rooms, medication rooms, charting etc.

c) Staff zone:

is an area only accessible to staff;

is not located within a department where patients are seen (example: a single office within the Emergency Department); and

examples include a staff lounge, office area, locker rooms etc.

Public zone:

is an area where the general public has access to but is not within a clinical/treatment department; and

examples include lobby, public washrooms, café, gift shop, Gathering/Sacred Space.

.3 Floor Finishes

The Participants will provide flooring that is complementary and integral to the functional and aesthetic requirements of the interior space.

The Participants will select floor finishes to suit types and concentration of pedestrian and/or vehicular/wheel traffic to be anticipated with special consideration to high volume traffic areas for finishes that are durable and require minimum maintenance.

The Participants will reference Elder friendly and dementia requirements where applicable in selecting colour and patterning.

Continuous integral cove base is required with all sheet flooring in all areas except as referenced in Appendix 2L Room Finishes Matrix. Base height is minimum 150 mm.

The Participants will Design and select floor finishes to comply with the following criteria:

Provide for ergonomic comfort in area where staff may stand for extensive periods of time;

Provide for cleaning, maintenance and infection prevention and control, Minimize frequency of joints and seaming. Heat and or chemical seal joints. Allow for ease of replacement if and when required;

iii) imperviousness to concentrations of moisture anticipated to be existing on the floors and for the duration of that moisture;

permanence and durability and resistance to concentrated service traffic both pedestrian and vehicular;

low VOC emissions so as to minimize adverse impact on indoor air quality and indoor environmental quality; and

compatibility of patterns and textures with the requirements for pedestrian safety and elderly friendly Design.

Non-slip flooring will be used in all wet areas including: central cleaning and sterilizing, wash and change rooms, bathing/shower areas, patient washrooms, laundry, soiled utility and housekeeping rooms.

g) Non-slip flooring will be cleanable to IPC standards and include a waterproof membrane underneath in all wet areas.

Heavy-duty non-slip flooring, impervious to food acids and oils, suitable for rolling equipment will be used in all Food Service areas.

Provide electrostatic-free, slip resistant flooring material throughout Laboratory services.

All rooms with floor drains including patient shower floors and floors in tub rooms will slope to drain and be flush-walk-in without ridges for water retention. Minimum slope will be 2% and a maximum slope that allows for controlled movement of wheeled equipment and safety for patients and staff.

All rooms where there is risk of flooding or liquids accumulation on the floors will be provided with floor drainage system and a minimum of 2% slope to drain or by curbs and drains.

All rooms and floor areas with a risk to flooding spaces located below and/or beside and with a risk of water migrating into adjacent or lower floors, ceilings and walls will be Designed to contain any leakages within the room and on the floor to protect the floor below.

All exterior wall details at the floor level will prevent water migration from spaces above to spaces below.

Install flooring over materials that contain no more than the maximum percentage of moisture as recommended by the flooring manufacturer.

o) Moisture and humidity testing is required for any flooring to be placed over a slab on grade. Tests will demonstrate appropriate level of moisture content in the slab to suit flooring manufacturers' requirements. Flooring will not be placed/ laid until these requirements are met.

p) Provide sealed concrete hardened surface to all Material Management stores areas and storage rooms, as well as corridors to and from the Loading Dock area.

q) Flooring patterns should be scaled appropriately to avoid small cuts/insets that are susceptible to failure.

r) Floor patterns and seams should be Designed to prevent seams located at a junction where stretchers or heavy equipment is turning.

s) Flooring will not have specs or flecks in Laboratories where work with paraffin is conducted.

t) No carpet is acceptable in any areas of the Building.

u) Carpet tile flooring may be used in consultation with IPAC in non-clinical administration offices only, not in corridors or meeting rooms.

.4 Wall Protection

Select wall protection with smooth texture in clinical areas.

Provide contrast between handrail and backdrop surface to aid those who are visually impaired.

Ensure all mounting hardware is concealed. Accessories should be smooth and easily cleanable without multiple extrusions and ledges.

Thermoplastic sheet seams should be caulked with waterproof caulking. Do not use trim.

Semi-Rigid Panel wall coverings shall be welded together.

f) Corners of semi-rigid panel wall coverings shall be thermoformed where installed in wet areas.

g) Wall protection must be able to withstand frequent cleaning with hospital grade cleaning and disinfectant products.

h) Vinyl surface wall covering will not be used in locations where there is a risk of moisture migration through the covering into the wall or partition behind.

5.5.4 Millwork

No exposed substrate is acceptable. All edges must be finished.

.2 Solid surface sinks and counters will have a preformed coved integral backsplash.

Stainless steel counters are to be integrated with sinks and have a continuous integral backsplash minimum 150mm height.

.4 Height and depth of millwork should be Designed to ergonomics best practices.

Stainless steel counters to have a marine edge.

.6 All Projecting corners to be rounded.

5.5.5 Showers

Showers will meet the following requirements:

the shower room flooring will be integrally sealed with the shower base or wall finish so that water cannot penetrate under any section of the flooring, or out of the shower area and onto the floor or into the adjacent room or corridor.

wall bases will be integral with the floor, tightly sealed against the wall and constructed without voids.

c) All wall ceiling and floor finishes will be seamless.

the wall, ceiling and floor finishes will be cohesive and be detailed to create a water-resistant finish system.

flooring should be comfortable to the bare foot while still providing the security to prevent slipping.

Coordinate any accessories (ex: grab bars) and millwork with the wall finish to ensure a water-resistant system is not compromised.

5.5.6 Operating and Procedure Rooms

.1 Finishes in operating and Procedure Rooms need to be:

Monolithic with minimal seams;

bonded to adjacent materials to avoid gaps, seams and cervices;

stain resistant;

nonporous; and

compatible with the cleaning and disinfectant products used for environmental cleaning.

.2 Wall finishes will be smooth, continuous and without joints and fissures to avoid the accumulation of bioburden.

5.5.7 Alcohol Base Hand Rub (ABHR) hand hygiene stations

Coordinate wall and floor finishes with the location of ABHR hand hygiene stations. Ensure the selected finishes will not be compromised by any dripping or puddling of excess ABHR.

Ensure no ABHR hand hygiene stations are located on plastic laminate wall panels, graphics, or Design features.

5.5.8 Graphics

The Participants will:

Provide opportunities to incorporate graphics throughout the Facility to enhance the patient experience.

provide images appropriate for the emotional and psychological needs of patients and staff;

provide images that contribute to the creation of a healing environment;

provide graphics that supports the architectural narrative.

provide graphics and images that are selected in consultation with Indigenous Advisory Council;

.2 Where graphics are located in clinical areas ensure image ink, image substrate and image overlaminates are compatible with the disinfectant used for environmental cleaning.

Image content should not be disorienting to patients.

5.5.9 Art Works

.1 Refer to Appendix 2C Design Guidelines and Appendix 2K Art, for additional art information.

.2 The Owner intends to procure various art works for display within the Facility. The Design should allow for the display of artwork as follows:

in the interior allow for Designated wall surfaces to display art:

in internal public spaces such as reception areas, meeting rooms, gathering spaces, waiting areas;

ii) in circulation spaces including main areas of public access wayfinding nodes and corridors; and

in semi-private internal spaces including inpatient bedrooms and staff lounges

in the exterior allow for accommodation of Welcome Figures to be installed at grade;

c) allow for the development of local community art Projects to be included as part of Project Design;

d) provide specific corridors and display spaces for art;

e) Provide lighting, power and structural support to enhance the display of art works on the interior and in the exterior;

Provide millwork framing or cases with integrated single piece glazing for art works where necessary; and

g) All art works and their display will meet IPAC standards and requirements.

.3 The Participants will:

Design the Facility to support the Owner's art program by providing and identifying for the Owner effective and appropriate locations for major and minor art works throughout the Facility;

coordinate the delivery (including timing of delivery) of art works with the Owner and install all art works procured by the Owner;

provide lighting to enhance the display of all art works; and

provide all necessary structural support, seismic restraint, vandal- proof mounting

and other protective measures required for particular art works.

.4 The Participants will provide four outdoor locations for art such as sculptures, including mounting pad, power and lighting.

5.5.10 Ergonomic Design

.1 The Participants will provide:

detail Design elements, to facilitate the physical activities of the staff and patients and to increase their safety, efficiency and general well-being, as well as, to assist in eliminating ergonomic risk factors;

for all inpatient care rooms (including washrooms) to accommodate lifting and transfer devices;

c) ergonomic Design, consistent with good industry practice, of all work spaces including millwork, furniture, lighting, and finishes to eliminate strain and injury to health care workers; and

adjustable work surfaces and shelves to allow for flexibility of use in Team Care Stations.

workspaces conducive to effective and efficient workflows and processes.

ergonomic solutions to millwork with fully coordinated technology locations (ex: CPU, monitor, keyboard tray etc.).

5.5.11 Storage Shelving - Clinical

.1 Provide storage shelves for clinical and sterile supplies that:

Are cleanable with required cleaning and disinfectant products;

Are at a minimum of 460mm from ceiling to ensure adequate functioning of fire sprinklers or full height;

Are 250mm from the floor and 50mm from an exterior wall;

Are seismically restrained;

If open storage shelving is provided for storage the bottom and top shelf of such shelving will be a solid surface;

Consult with IPAC and Owner to determine if storage should be open or closed.

g) Storage shelving should not be directly exposed to direct airflow from the HVAC system; and

h) Shelving should be made of non-porous materials on all surfaces, no shedding, and free from burs, and sharp or rough edges.

5.6 Acoustic Requirements

5.6.1 The CDHRP will be Designed to ensure that the acoustic environment of the Building is compatible with the general needs and comfort of the occupants and the surrounding residential community.

5.6.2 The planning of the Building will not locate inpatient bedrooms, Operating Rooms, Procedure Rooms, ICU patient rooms, Maternity and newborn patient rooms and labour and delivery rooms adjacent to high noise producing areas. Appropriate horizontal and vertical acoustic Construction will separate acoustically conflicting occupancies.

5.6.3 The siting of the Heliport will be located and Designed to consider the acoustic requirements of the surrounding patient occupied spaces (both indoor and outdoor within a 50m diameter of the Heliport) and provide for mitigation measures where required.

5.6.4 Vibration isolation will be provided for and including mechanical systems, electrical systems and plumbing equipment.

5.6.5 Participants will adhere to municipal noise bylaws.

5.6.6 Recommended standards of horizontal and vertical acoustic Construction will separate acoustically conflicting occupancies. The minimum sound transmission class (STC) of walls for various rooms will follow CSA Z8000 Section 12.2.7 as well as the requirements for glazing and doors.

5.6.7 Single wall Construction with the corresponding STC rating confirmed by an acoustic consultant may be used between public washrooms and adjacent occupied spaces as an alternative to double walled construction.

5.6.8 Refer to Appendix 2F UBC Faculty of Medicine Design Guidelines and Functional Requirements for acoustic requirements.

5.7 Interior Wayfinding and Signage Requirements

5.7.1 Overriding Principles

The Participants will:

Design a wayfinding system and signage to be fully integrated with the Design of the Facility and to be Site specific;

Refer to Island Health Interior Signage Guide Island Health Facilities for requirements;

The Participants will use a strategy of progressive disclosure for signage information for the Facility.

The Participants will use multimodal signage information as part of the wayfinding and signage strategy.

Comply with the requirements of CSA Z 317.14 Wayfinding for HealthCare Facilities;

f) Coordinate in consultation to determine any additional wayfinding Standards and wayfinding language that the Participants will have to follow;

locate major destinations, such as department entrances, directly off of entry lobbies and/or along primary circulation paths for easy access. Make waiting areas as open as possible to circulation routes without requiring wayfinders to pass through waiting areas;

h) provide significant recognizable, easily named and identified elements in key and easily found locations that will become 'meeting points' for patients and visitors; and

i) provide clear and direct circulation systems so that wayfinding is inherently easy;

Design waiting areas to be distinct from circulation routes;

Design public elevator and stair lobbies and public circulation routes to be visually distinct from service and from other non-public routes;

l) provide all signage required for Facility operations and as required by the BC Building Code;

m) Design signage such that the materials, colours, letter fonts, sizes and other aesthetic and functional considerations, such as braille, conform to a conceptually coherent overall wayfinding Design system and respect the wall finishes;

n) provide signage that is resistant to graffiti and physical damage complete with concealed fasteners;

o) provide signage that is easy to replace when necessary;

p) use international symbols where required;

q) Use universal symbols for healthcare in consultation with the Owner;

r) orient all Facility plan directories to reflect the direction from which they are viewed;

s) provide signage that directs visitors to departments and rooms within;

t) provide signage that is clearly visible day or night;

u) avoid multi-layered naming hierarchies and complex numbering systems;

v) use a professional signage/wayfinding Designer to prepare a unified signage/wayfinding concept submittal as part of a Design review;

w) incorporate signage and wayfinding into the overall exterior and interior Facility Design;

x) Design signage that addresses the needs of those with limited mobility, impaired vision and/or cognitive ability; and

y) place all signage to be withing a vision cone of a person standing or sitting in a wheelchair.

5.7.2 Design Requirements

.1 The Participants will provide main directories, installed at the main public entrances to the Facility, that indicate the location of every area and department within the Facility that is accessible to the public;

.2 The Participants will provide elevator floor directories at all elevator lobbies. They will include floor level listing of departments;

The Participants will provide:

a continuous 'trail' of signage from the entrances to each of the reception/information points listed on the directories;

installation of signage at each point at which a directional decision is required; and

c) consistent terminology;

.4 Overhead directional signage must either be suspended from a ceiling or bulkhead or be mounted directly over doors.

No directional signage will be incorporated into flooring.

The Participants will provide:

door signage to indicate restrictions on entry and warn of hazards including "Laser in Use" and "X-ray in Use" signage;

door signage which is not obscured by emergency systems or other functional

elements of the Facility;

door signage that will identify every space (e.g. rooms, alcoves, corridors and stairwells) in the Facility;

door signage that will be located in a consistent location for every room in the Facility;

door signage that is consistent with the following room numbering protocol:

each room and space has a unique identifier number;

rooms are numbered in a manner that reflects normal movement through the Facility;

labelling anticipates a person attempting to follow numbering along corridors in sequence;

blocks of numbers are periodically skipped to allow for future flexibility of the numbering system if rooms are added through renovations;

corridors numbered with unique, two-digit numbers;

stairwells numbered with unique, single-digit numbers; and

is not obscured by any other infrastructure, including the emergency systems and Code Blue call system.

Design external directional signage to:

clearly indicate access for the public;

clearly indicate restrictions to 'after-hours' access and closest accessible entrance;

iii) be well illuminated, backlit, reflective or high contrast and easily visible at night; and

g) ensure that illuminated external Facility signage:

i) clearly identifies the Facility;

minimizes light spillage; and

iii) indicates the accesses, parking and restrictions for various vehicle types, as required.

.7 Each room requires a number for service reasons and since many rooms will not have formal wall numbering panels, each door frame will be equipped with a lamacoid, or approved equivalent, number plate approximately 25 mm high by 50 mm long, attached to the head of the door frame on the hinge side; and as this numbering system is used for deliveries, repairs, fire alarm notifications.

Room numbers are to be determined early in Design and in consultation with the Owner. Room numbering protocol be approved prior to implementation. Follow the same numbering system on Design and Construction documentation for all disciplines.

.9 Additional signage holders are to be provided for temporary notices such as IPAC notices in clinical and patient care areas and rooms.

5.8 Exterior Site Signage

5.8.1 Provide as many exterior Site signs at grade to identify the Facility and to comply with the Owner's operational requirements.

5.8.2 Place signage along Bell McKinnon Road and Hospital Road North and South.

5.8.3 Design and construct signage to withstand weather conditions and be provided with adequate lighting after dark.

5.8.4 Provide appropriate directional signage at grade onto property. Number and location of signs to be determined in consultation with the Owner and illustrated on Site plan.

5.9 Exterior Facility Signage

5.9.1 Provide aluminum cut out letters, backlit signage with the name of the Facility on three faces of the Building envelope, in consultation with the Owner.

5.9.2 Signage Letters to be a minimum of 600mm high and to be seen and read from Bell McKinnon Road by day and night.

5.9.3 Provide "Emergency" signage at exterior entry to Emergency Department.

5.10 Permanent Donor Wall

5.10.1 In consultation with the Owner and the Foundation provide a permanent donor wall:

That is accessible and can be viewed from a prominent public area in or adjacent to the Lobby;

.2 Is technology enabled with video technology, power, lighting and network capabilities; and

.3 Is 7620mm wide and 2000mm tall, installed at eye level and the text is legible from 1800mm away.

.4 The Foundation will provide the content and display items for the wall.

5.11 Territorial Acknowledgement Walls

5.11.1 In consultation with the Cowichan Nation representatives Design and provide permanent Territorial Acknowledgement Walls. These walls will acknowledge the First Nations' traditional Ownership of the land on which the Facility is built and illustrate in words and graphics the messages that the representatives want to present to the public about their histories and cultures.

5.11.2 At the front entry provide for a wall length of approximately 5m (16 ft) that is accessible and can be viewed from a prominent public area when first entering the Building. Provide for full wall length and height that is clear of other notices and mechanical and electrical services that would interfere with the presentation.

5.11.3 The wall is to be technology enabled with with video technology, power, lighting and network capabilities;

5.11.4 At the Emergency Department entry provide for a clear full wall length of 2m and full height that is accessible and can be viewed from a prominent pubic area; and

5.11.5 Provide additional walls that are accessible and can be viewed from a prominent pubic area on each upper and lower floors at public elevators. Provide for a wall length of 2m and full height clear of other notices and mechanical and electrical services that would interfere with the presentation.

5.11.6 The messaging content and how it will be displayed on the Territorial Acknowledgement Walls will be arrived at through consultation with the Cowichan Nation and Owner representatives. The displays are expected to be high quality crafted and artistic elements that are provided by First Nation's artisans and/or crafts people. The Territorial Acknowledgement Walls will be provided by The Participants.

5.12 Structural Design

5.12.1 Structural Design Principles

.1 The structural systems are to be selected to provide a comfortable and safe environment for patients, visitors, and staff, well suited to meet the requirements of the identified program and patient care needs in an efficient manner, and adaptable to future reallocation of space and functions.

.2 The Participants' structural engineer of record will be a Designated structural engineer with "Struct. Eng." standing with EGBC and licensed to practice in the Province of British Columbia with demonstrated experience in undertaking the structural Design of Buildings similar in size and complexity to the Facility.

Prior to starting Construction of the Facility, the Participants' structural engineer of record will have a qualified second Professional Engineer licensed in the Province of British Columbia perform a concept review satisfying the requirements of the EGBC Quality Management By-Law.

.4 The structural Design, including minimum Design loads and general provisions and material specifications, will satisfy the more stringent requirements of the BC Building Code supplemented by the climatic forecasting requirements noted in Section 3.4.3.1, other applicable or referenced Design Standards, loading criteria required by equipment suppliers or Construction techniques, and the principles detailed in this Section.

The Facility structures will conform to the requirements of post-disaster Buildings as outlined in the BC Building Code.

.6 The structural engineer of record will review pertinent shop drawings, perform Construction field review of sufficient frequency, and review inspection and materials test reports to confirm that the Facility structure has been constructed in substantial conformance with the approved Construction documents.

.7 The structural engineer of record will establish and maintain a quality management program throughout Design and Construction.

The Participants will ensure that all structures are self-supporting and do not derive structural support or restraint from existing Buildings or assets, unless discussed and agreed with the ALT.

.9 Structural analyses used to demonstrate compliance of the primary structural frame with performance criteria will only consider the contribution of primary structural frames. Secondary structural elements, such as masonry, metal studs, purlins, unreinforced concrete, facades, partitions, barriers, balustrades and low-strength concrete will not contribute to the primary structural frame meeting the performance criteria outlined in this document.

.10 The Facility will be Designed to achieve LEED Gold certification in accordance with Section 3.4. The Participants will investigate and incorporate the following strategies into the structural systems as appropriate to support the sustainable Design of the Facility:

efficient selection and use of structural materials to reduce the non-renewable resources required for the manufacture of structural components;

completion of a life-cycle analysis for the structural system and materials selections;

use of structural steel and reinforcing steel consisting of greater than 90% recycled content;

consideration of thermal mass of the structural elements and the ability to act as a thermal fly-wheel to reduce peak demands on mechanical and electrical systems;

re-use of waste materials from industrial processes, including the use of fly-ash and carbon capture (waste CO_2) in concrete mix Designs;

f) minimization of thermal bridging effects, including at doorways, canopies, mechanical equipment supports, and other locations where the structure meets and/or passes through the Building envelope;

control of dust, water and erosion during Construction; and

protection and/or relocation of existing mature trees from the Site.

No in-floor conduit is permitted in suspended concrete floor systems. Conduit may be embedded within concrete toppings placed above and non-integral to the primary structural floor systems.

Carry out the Construction so that Construction-caused settlement of existing Buildings and structures does not exceed 6mm at any location.

.13 The Participants to limit noise and vibration transfer to adjacent existing facilities due to Construction activities to the satisfaction of the ALT.

.14 This section is to be read in conjunction with all Appendices.

5.12.2 Structural Systems

The preferred structural system for the suspended floors consists of cast-in-place concrete flat slab Construction. Any other proposed system will provide similar performance for adaptability or change, vibration control, fire rating, acoustic separation, ceiling space available for services, and overall Building height.

All Facility substructures will be exclusively cast-in-place concrete.

Lateral seismic and wind loads will be resisted by strategically placed reinforced concrete shear walls that encompass stair wells and elevator shafts. Shear wall placement will be in accordance with Section 5.12.4 to maximize flexibility for future change within the Building.

Roofs shall be structural steel or concrete slab Construction. Structural steel roofs can be part of the Facility Design and massing strategy to reduce settlements of adjacent Buildings. Open-web steel joists are not permitted in areas containing clinical spaces, storage of materials related to Facility functions, or where elements, including ducts, piping and equipment, are suspended from the floor or roof structure and may need lateral restraint for seismic loading.

.5 The Design will incorporate an additional 100mm thick non-composite concrete topping slab within all diagnostic imaging areas to facilitate the integration and easy relocation of conduit and services to equipment.

.6 Prestressed concrete Construction is not permitted for the Facility.

.7 Post-tensioned reinforcement will not be used as a reinforcing element in any structural member.

5.12.3 Foundations, Substructures and Earth Retaining Structures

Building foundation system and Site preparation Design will be in accordance with recommendations from a qualified geotechnical engineer registered in the Province of British Columbia.

.2 The impact of foundation settlement on both the Service Limit State and Ultimate Limit State of structures will be considered.

Foundations will be Designed by the Participants' structural engineer of record together with the Participants' geotechnical engineer. The Participants will cause their structural and geotechnical engineers to be jointly responsible for foundation Design (including causing both to sign the appropriate sections of Schedules B & C of the Building Permit submission).

.4 The Participants will ensure that the short-term and long-term settlement (lateral, vertical and rotational) of foundations under all service loads and factored load combinations will be limited such that they do not adversely impact the intended use and occupancy of the structure, nor damage the Facility's structural and non-structural elements, including but not limited to equipment, partitions, façade, glazing, and finishes.

The long-term differential settlement in any structural bay will not exceed the lesser of 20mm or 1/500 the distance between adjacent walls and/or columns.

.6 The Design of the Facility foundation systems will be appropriate for the adjacency of the foundations and excavation to existing assets, including Buildings, utilities, and roads. The Participants are responsible for executing all temporary (and permanent) works, including excavation and shoring, in a manner that minimizes impact to adjacent assets. The Participants will identify and assess all assets for potential damage based on estimated ground movement associated with excavation and shoring, dewatering, and vibrations. Acceptable criteria for limiting impact on assets and services/operations provided in these assets will be developed as part of the detailed Design and monitoring and instrumentation will be required throughout the Construction to ensure these limits are not exceeded. Acceptable criteria are subject to discussion and agreement with the Owner prior to commencement of the Alliance Works.

During Site preparation and Construction, the Participants will cause their structural and geotechnical engineers to provide Site reviews and oversee appropriate testing (by the Participants) to confirm that the general intent of the foundation and Site preparation Design recommendations are carried out.

.8 The Participants will make provision for adequate frost protection, as well as adfreezing between the soil and exterior foundations, in the foundation Design. This will be achieved by placing foundations at adequate depth or by utilizing alternative solutions acceptable to the Owner.

.9 If driven piles or cased piles are adopted for the Building foundation, the Participants will demonstrate that the vibration and noise impact of pile driving or casing installation or withdrawal will not cause disruption to function, use or occupancy of adjacent properties and existing assets.

.10 The Participants will not use tie-back earth retaining systems as an essential part of the permanent structure.

If expected movements of a grade-supported floor slab cannot justifiably be accommodated or tolerated, a structural slab is to be provided. If a slab is constructed over void form, ensure that buried plumbing is adequately suspended from the floor slab, and that it is isolated from the soil such that soil movement will not damage the piping or induce loads into the slab.

.12 The Participants will minimize the ingress of soil gas, including radon, in accordance with the BC Building Code.

.13 The Participants will ensure that:

a) the waterproofing liners and concrete admixtures have been appropriately selected and installed to mitigate water ingress into below grade portions of the Facility;

Construction joints are Designed to prevent water ingress;

there is no water penetration into any basement areas (including crawlspace areas) as described in CIRIA R139 minimum performance level of Grade 2; and

the water tightness achieved in all areas is appropriate for the intended use and occupancy of such areas.

.14 If drained structures are adopted, the Participants will demonstrate that:

Long-term inflows (water seepage rate) are sufficiently low and can be managed by a permanent drainage and pumping system;

The pumping system has an appropriate level of redundancy and emergency power supply;

c) on-going maintenance costs do not exceed what is considered acceptable to the ALT; and

The entire weeping tile system/grid has been inspected and cleaned prior to Substantial Completion. If sections of the weeping tile/grid are damaged by Construction, they will be replaced prior to turning the Facility over to the Owner.

5.12.4 Flexibility for Future Change

.1 The structural form must be conducive to the future reallocation of space and functions. Incorporate into the Design and Construction the principle that change will be a constant and inevitable throughout the life of the structure. The structural systems will permit change while minimizing the cost of future changes and the interruption of the Facility activities.

.2 The structure of the Facility will be designed to accommodate the future masterplan expansion outlined in Section 3.2, complete with inclusion of appropriate allowances in the design of structural members and systems for future expansion loading, including but not limited to expansion dead loads, occupancy loads, lateral loads, and snow drifting effects.

The lateral stability elements for the Facility will be stacked in plan and the system for the Facility Designed to provide the most adaptable floor plate arrangement possible, with shear walls and bracing elements located around stairs and elevator cores and if necessary, around the perimeter of the Facility.

.4 The number and size of columns will be minimized to maximize the clear floor space available.

The structure will be capable of accommodating the loads from equipment associated with a component anywhere on the floor area allocated to that component.

.6 The structure will be capable of supporting the future access, transport, installation and removal of plant and other equipment, while the new plant and other equipment remains operational and without impacting vertically or horizontally adjacent areas. Identify on the drawings an equipment travel path for replacement of all major equipment.

Live load reduction factors will not be used in the Design of the structural systems, except for the Design of columns and foundations.

The sizes of all service riser penetrations in the Facility floor structure will have an additional 25% capacity for future renovations.

.9 Design the floor structure to be able to accommodate one (1) 150mm diameter cored hole per structural bay at almost any location in the floor plate. The Design of the concrete floors will assume at least one reinforcing bar in each direction at each core location is cut.

.10 Design the floor structure with a minimum of one (1) 200mm diameter knock-out openings on two sides of each column for future use (two total knock-out openings per column); the knockout openings will be in addition to any openings required for current services and must be readily identifiable in the future.

Include anchor points for roof access and activities such as window washing and replacement of heavy equipment on multi-storey Buildings. Anchor points will also be provided in mechanical areas with heavy equipment and to access interior tall atria.

.12 Within the lowest level of the Facility, utility trenches with removable covers are to be set into the slab on grade for the below-slab electrical and communications distribution networks, sized to provide an additional 25% capacity for future renovations and expansion.

.13 See Sections 3.6 and 5.1 for additional adaptability and flexibility requirements.

5.12.5 Design Loads

Live Loads

Use the following minimum floor Design specified live loads except where the specific use and occupancy of a space requires higher live load – structural Design is to consider both uniform distributed loads and concentrated loads, governed by whichever produces more critical effects:

i) Basement and Main (ground) Floor

- General: 4.8 kPa or 9.0 kN;
- Other as below.

ii) Upper Floors

- General: 3.6 kPa or 9.0 kN;
- Corridors and Exits: 4.8 kPa or 9.0 kN;
- Other as below.

Medical Imaging and Perioperative Services Surgical Suites: 4.8 kPa or 18.0 kN;

Major Equipment Travel Path: 4.8 kPa or 30.0 kN;

Materiel Management / Service Centre: 7.2 kPa or 25.0 kN;

Mechanical/Electrical Service Rooms: 7.2 kPa or 15.0 kN;

Medical Records Storage/Mobile Shelving: 12.0 kPa or 25.0 kN;

Plaza, Driveways and sidewalks over basement: 12.0 kPa or 54 kN

Roof

- General: 1.5 kPa or 1.5 kN;
- Above Mechanical/Electrical Rooms: 2.0 kPa or 4.5 kN;
- Heliport: 4.8kPa or 126.78 kN (includes impact multiplier)

Sheltered ambulance bays and Loading Dock: 12.0 kPa or 54.0 kN.

Mechanical Penthouses: 6.0kPa or 12kN.

Design upper floors to accommodate concentrated loads from equipment, fixtures, and machinery (including medical equipment and patient lifting devices), whether floor, wall or ceiling-mounted, anywhere within the area designated for that equipment use. The design of ceiling slabs for rooms designated as Perioperative Services Surgical Suites space are to be designed to accommodate the loads from equipment (typical C-Arm) associated with a component anywhere on the ceiling area allocated to that component. Additional below slab structural supports and mounting bracing will not be required for ceiling mounted equipment.

c) Roofs will be Designed to accommodate concentrated loads from equipment, machinery and features, whether roof or ceiling-mounted, including medical equipment and patient lifting devices in addition to the specified live load above.

d) The Heliport Design load must be reviewed against the certified Heliport capacity in coordination with the Owner. In accordance with Transport Canada requirements, the structure supporting the Heliport must be Designed to accommodate the static load of the helicopter's maximum certified take-off weight applied through the contact area of the wheels or skids, and the dynamic load equal to at least 150% of the maximum take-off weight applied through the contact area of the main wheels or the contact area of the skid, for the largest Designated helicopter to be permitted access to the Site. Refer also to section 5.14.11 for additional Heliport loading requirements.

Superimposed Dead Loads

Design floors for a minimum superimposed specified dead load allowance of 1.0 kPa to allow for partitions, and 0.5 kPa to allow for ceilings and mechanical equipment (other than medical equipment) and as otherwise required for the actual partition, ceiling and mechanical equipment loading. On main floor partition loading allowance is to be increased to minimum 2.0 kPa to accommodate larger floor to floor height.

Partition superimposed dead load allowance is to be increased as required to accommodate actual partition loads that exceed the above allowance due to material selection and/or higher than typical floor-to-floor heights.

Design roofs for the superimposed specified dead load of roofing materials, ceilings, mechanical equipment, and photovoltaic (PV) arrays, but not less than 2.0 kPa.

Design floors and roofs above mechanical and electrical service rooms, including telecommunication and computer rooms, for an additional superimposed suspended equipment specified dead load equal to the greater of 2.0 kPa or the actual weight of the suspended equipment, whichever produces the more critical

effect, in addition to the minimum dead load allowances specified above.

The Design of floors for rooms Designated as mechanical or electrical space will allow for a minimum 100mm thick concrete housekeeping pad or 100mm thick concrete floating slab, as well as any additional treatment or finishes required to meet the Facility performance criteria.

The Design of floors for rooms Designated as Medical/Diagnostic Imaging space will allow for a minimum 100mm thick concrete topping, as well as any treatment or finishes required to meet the Facility performance criteria. The allowance for 100mm thick concrete topping may be omitted for Medical/Diagnostic Imaging spaces located on slabs-on-grade.

g) Design Building roof structure to accommodate the weight of the Heliport structure, appropriate to the system selected, in addition to the live load requirements of the helicopter.

h) Adequate allowance will be made for heavy equipment loads, in access ways, aisles or spaces where equipment, mechanical equipment, and electrical equipment is likely to be moved or located. This allowance will include provision for future items of equipment being installed while the adjacent equipment being replaced remains in operation.

Adequate allowance will be made for the suspension of medical equipment in addition to the loading noted above, including gantry lifts in every inpatient room. For Bariatric rooms, allowance will be made for the suspension of patients lifts suitable for the support of a minimum 454kg (1,000lbs).

.3 Wind Loads

Design the structure, secondary structural elements, and cladding for wind loading in accordance with the BC Building Code and referenced Standards, supplemented by the climatic forecasting outlined in Section 3.4 Sustainability and Resilience including gust and uplift effects.

The structural Design and calculation of the Design wind loads will consider the potential for the future installation of operable windows, as incorporated in the architectural Design.

The Design of secondary structural elements (e.g. partitions) will consider the potential for windows broken during storms creating significant pressure differentials and the impact of mechanical ventilation pressure differentials. The structural design shall conform to the following:

For the Design of interior partitions in spaces adjacent to exterior walls, internal pressure coefficients outlined in Design Category 3 of the National Building Code Structural Commentary, with a minimum unfactored pressure difference of 0.5 kPa will be used.

For the Design of other interior partitions, internal pressure coefficients outlined in Design Category 3 of the National Building Code Structural Commentary, with a minimum factored pressure difference of 0.5 kPa will be used.

Deflection limits to be per the National Building Code and the National Building Code Structural Commentary, using an importance factor Iw of 0.75.

Design roofs for a minimum unfactored applied uplift wind load of 2.0 kPa, and as required to accommodate the PV arrays, and as required to meet the BC Building Code and referenced Standards.

Design the roof structure to accommodate wind and uplift loading for PV arrays.

The Participants will complete wind tunnel testing to determine service ultimate wind loads on the Facility where Building form or shape prevents the determination of wind loads from the BC Building Code with reasonable certainty.

.4 Snow and Rain Loads

Design roofs for snow and rain loading in accordance with the BC Building Code and referenced Standards, supplemented by the climatic forecasting outlined in Section 3.4 Sustainability and Resilience, including drifting effects adjacent to high roofs and obstructions and ponding effects caused by blockage of roof drain(s).

b) Design the roof structure to accommodate snow accumulation and drifting for PV arrays.

The Participants will not incorporate melting systems to reduce the Design snow load, below the requirements of the BC Building Code. Refer also to Section 5.14 for Heliport ice-melt system; structural Design is to assume Heliport ice-melt system is non-operational for basis of Design load calculation.

.5 Other Loads

In addition to loads due to soil, foundation walls will be Designed for a minimum surcharge specified live load of 12.0 kPa.

Structural columns and walls adjacent to vehicle traffic (roadways, Loading Dock, and driveways) will be Designed for vehicle impact loads, including both accidental and intentional impact, unless it can be demonstrated that the structure is adequately protected from impact (e.g. by bollards).

Design floor, wall and roof structures to support the loads from all equipment and all artwork, irrespective of whether the equipment or artwork is supplied by the Participants or Owner. Applicable loadings will include gravity, seismic, wind and operational loads.

d) Specific loading allowances will be made for patient lifting rails above beds, lift rails in to washrooms, equipment booms, hung equipment on rails, and ceiling mounted exam/surgical lights, IV tracks, theatre pendants, artwork, internal signage, external signage, and display material in public areas, inpatient units and corridors.

Structural elements are to be Designed for exterior temperature ranges determined using the 1% January and 2.5% July air temperatures.

f) The Participants will consider the deformation properties and temperature ranges as described in the National Building Code Structural Commentaries in the structural Design and analysis.

Specific loading allowances will be made for window washing anchors and other roof access activities such as replacing heavy equipment on multi-storey Buildings. Loading allowances will also be made for lifting anchor points provided in mechanical areas with heavy equipment.

5.12.6 Deflection Limitations

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 2.3.6 as a minimum and as appropriate for equipment requirements and other non-structural components of the Facility.

.2 Notwithstanding the above, the vertical deflection limits will not exceed the following requirements:

for concrete floor or roof Construction, the maximum deflection occurring after the installation of non-structural elements, including long-term creep deflection and live load deflection, will not exceed span/480 and total short and long-term combined deflection will not exceed span/360, in no case exceeding a limit of 20mm relative movement between adjacent floors;

for steel or timber floor Construction, the maximum live load deflection will not exceed span/480 with the total load deflection not exceeding span/360, in no case exceeding a limit of 20mm relative movement between adjacent floors. Total load deflection is to include effects of shrinkage of concrete topping slabs;

for steel or timber roof Construction, the maximum live load deflection will not exceed span/360 and the total load deflection will not exceed span/240; 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 20mm.

.3 Notwithstanding the above, the horizontal deflection limits will not exceed the following requirements:

the maximum deflection under specified wind and seismic loading of members supporting curtain wall will not exceed span/360, and in no case more than 20mm;

the maximum deflection under specified wind and seismic loading of members support masonry veneer will not exceed span/720, and in no case more than 12mm;

storey drift due to specified wind load will not exceed height/500; and

storey drift due to seismic load will not exceed height/100.

5.12.7 Vibration Limitations

.1 Design the structural system to minimize the effects of floor vibration due to use, occupancy, and equipment. Vibration is to be limited to acceptable levels for the use and occupancy of the floors.

.2 Floor system vibration characteristics are to be in accordance with Commentary D of the NBCC 2015 Edition.

.3 Performance Criteria

The Participants will ensure that the structure, including lightweight elements, facades, partitions, shelving, glazing, mechanical systems and light fittings do not exhibit any adverse response to vibration.

The Participants will ensure that vibrations and resonances do not adversely affect performance, serviceability, safety, stability, or appearances of the structure, services, equipment, applied finishes or secondary Construction (e.g. partitions).

c) Select and Design floor structural systems to have a vibration acceleration maximum limit of 0.5%g with a damping ratio of 0.02 when an excitation force of 0.29 kN is applied.

Machinery that could be a source of vibration is to be mounted using vibration isolation techniques; this includes the potential dynamic loads associated with the use of the Heliport.

In areas supporting sensitive equipment and occupancies, Design the structure for vibration limitations specified by the manufacturer of the specified equipment or required by the planned use and occupancy of the floor space. In-situ measurement verification of floor vibration characteristics is to be carried out where specified by the equipment manufacturer.

Design roof mounted platforms and walkways to avoid transmission of sound or vibration through the roof to occupied spaces below.

Design roof and Heliport support structure to mitigate vibration in accordance with Section 5.14.16.

h) Consult with users about the locations of sensitive equipment and Design the structure to support the equipment per the equipment specifications.

i) To verify compliance with the vibration requirements a qualified testing firm will be retained. The testing firm will measure the vibration using instrumentation which may include transducers, accelerometers, signal-conditioning equipment, data recorders, and analysis systems. Measured vibration performance characteristics for the structure must meet the requirements set out in these specifications. The following table indicates acceptable vibration levels for various typical medical and non-medical Facility spaces:

Occupancy or Equipment Requirements	Vibrational Velocity (1)		Floor Stiffness KFn (2)
	µin/s	µm/s	Kips/in-sec
Mechanical rooms on an unoccupied floor above or below an occupied floor	To match the most stringent occupied space directly above or below the mechanical room		Not Applicable
Office areas, waiting rooms and corridors	8000	200	250-1500
Mechanical rooms on the same floor as an occupied area	To match the most stringent occupied space directly adjacent to the mechanical room		Not Applicable
Computer areas; patient care areas (daytime) – threshold of human perception	8000	200	500-3000
Patient rooms and other sleep areas	5600	140	700-4200
Operating Rooms and critical work areas; bench microscopes up to 100x magnification	4000	100	1000-6000
Bench microscopes up to 400x magnification; optical and other	2000	50	2000-12,000

precision balances; optical comparators			
Microsurgery, eye surgery; bench microscopes at magnification greater than 400x; optical equipment on isolation tables	1000	25	4000-25,000
Magnetic resonance imagers	500	12	8000-50,000
Mass spectrometers	250	6	16,000-100,000
(1) Value of constant velocity regions measured in one-third octave bands of frequency range 8 to 100 Hz. Based on ASHRAE, AISC and ISO criteria. (2) KFn depends on walker weight and gait. Ranges indicated reflect average to conservative Designs. Average walker (150lbs, 75 steps/min). Conservative walker (185lbs, 100 steps/min)			

5.12.8 Durability

The structure will meet or exceed the requirements of CSA S478 Guideline on Durability in Buildings for a Long Life Category Design Service Life (50 to 99 years), including all primary structure and all secondary structure supporting cladding systems.

.2 Design the structure and structural components of the Facility to minimize the effects of corrosion and deterioration due to the environment and use in accordance with the following:

provide adequate concrete crack control joints and expansion / contraction joints: reinforce concrete for crack control.

Design all areas subject to vehicle traffic or parking to CSA S413, including use of concrete conforming to Exposure Class C-1 for slabs and unprotected walls and columns.

provide embedded steel protection angles to exposed columns in areas subjected to vehicular traffic;

provide protection against the effects of anti-icing agents;

hot-dip galvanize exterior exposed steel and any steel that may be subject to spills or leaks of corrosive solutions;

hot-dip galvanize embedded steel protection angles, ladders, exterior platforms, exterior anchor rods, and skid plates for Loading Docks and garbage compactors; and

g) all connection hardware for exterior wood framing will be hot-dipped galvanized.

5.12.9 Member Design Criteria

Design all floor and roof structural framing members to have sufficient strength and stability so that the factored member resistance is equal to or greater than the effects of the factored loads.

.2 Design all floor and roof structural framing members to have sufficient stiffness so as to remain serviceable under the specified loads.

.3 All secondary structural elements attached to the base-Building structure will be Designed by a Professional Engineer. Shop drawings of such elements will be reviewed by the engineer of record. Sealed schedules will be submitted for all secondary structural elements.

.4 Design all structural members supporting the cladding systems to have sufficient strength and stability so that the factored member resistance is equal to or greater than the effects of the factored loads.

.5 Design all structural members supporting cladding system with sufficient stiffness so as to remain serviceable under the specified gravity and lateral loads and to prevent transfer of undue stresses to the cladding elements.

.6 Design the structure and its members to have sufficient structural capacity and structural integrity to safely and effectively resist all loads and effects of loads and influences that may reasonably be expected over the intended service life of the structure.

5.12.10 Medical Equipment Supports

.1 Design and provide for support/anchorage of all supplied equipment. Medical equipment will be supported, anchored, and braced to resist gravity, operational, and seismic loads in a manner appropriate for the functional and service requirements for the specific equipment.

.2 The Design for medical equipment supports, anchorage, and bracing will be carried out by a qualified Professional Engineer registered in the Province of British Columbia. Installation will be field reviewed by the Design Engineer.

Design and provide support/anchorage for patient lifts in all rooms noted in Appendix 2M Patient Lift Matrix, in accordance with the manufacturer's requirements. For bariatric rooms, design and provide support/anchorage for patient lifts suitable to support a safe working load of 454 kg (1000lbs), in accordance with the manufacturer's requirements.

Provide overhead monorail lifting beams (of a length suitable for the purpose of the space) that are attached to the ceiling, complete with trolley and hoists, each rated for a safe working load of 454 kg (1000lbs) in the following area:

Service Centre mechanical room.

Design floor and roof assemblies to support the gravity and seismic loads for floor, wall, or ceiling-mounted medical equipment. Ensure that steel content of structural members is compatible with equipment which is sensitive to steel content of surrounding structure.

Design the structure for the vibration limitations specified by the manufacturer of the specified equipment or required by the planned use and occupancy of the floor space and carry out in-situ vibration testing when specified by the equipment manufacturer.

.7 Where practical, Design the supports for ceiling-mounted equipment to be universal so that the supports may be used for various types of equipment.

Drilled insert-type anchors for medical equipment supports and anchorage are to be rated by the insert manufacturer for seismic and cyclic loading applications.

5.12.11 Mezzanines

Provide a mezzanine in the Service Centre if required.

For all mezzanines:

the mezzanine will be Designed to store equipment with a Design live load of 4.8 kPa;

provide a convenience stair to access the mezzanine;

c) the mezzanine floor surface will be smooth concrete;

provide a detachable guardrail section for the edge of the mezzanine where the hoist beam needs to access the mezzanine;

provide lift and equipment access to the mezzanine; and

provide mezzanines with minimum clear headroom of 2.4m above and below.

As an alternative to the requirement to provide a mezzanine in the area specified in section 5.12.11.1, the Participants may provide the total floor area equal to that required by the mezzanine under section 5.12.11.1 on the same floor level as the applicable area(s) specified in 5.12.11.1.

5.13 Exterior Improvements and Landscape

5.13.1 Soft Landscaping and Planting Design

Prepare a comprehensive Site landscape plan under the supervision of a BCSLA registered landscape architect.

.2 Develop a planting strategy using native and/or locally adapted deciduous trees and coniferous trees that provide seasonal interest in association with ground covers, shrub plantings, and perennials.

.3 Large scale turf areas are discouraged, areas of naturalized planting that reflects the Site context is encouraged.

.4 Determine if a high efficiency irrigation system connected to the Building Management System is required.

.5 Design planting to be low maintenance. Use of Indigenous flora will be considered a priority, in terms of minimizing maintenance and expressing an attitude about the local forest context.

5.13.2 Pedestrian and Vehicular Circulation

Create a high quality, vibrant, pedestrian-oriented environment that includes a connected network of pedestrian walkways, shared use paths, and trails that links into the surrounding context, following the principles of the Bell McKinnon Area Plan.

Design for functional separation of pedestrians and emergency, servicing, and public vehicles where possible.

Site signage and wayfinding will be used to distinguish between pedestrian, cyclist, and shared facilities. Vehicle entrances and circulation should be intuitive and focus on efficient layout and pedestrian safety.

Provide zebra markings and signage at all pedestrian crossings. In areas of high traffic, provide material surface changes to communicate to vehicles the need to slow down.

Drop curbs and curb ramps are required in appropriate locations, to facilitate safe, convenient, and efficient movement for those with mobility restrictions. Align drop curbs and crosswalks with Facility entrances.

.6 Provide safe and adequate pedestrian refuge space behind curb ramps.

.7 Slope hard surfaced pedestrian and vehicular provide positive drainage, with a minimum slope of 0.8% and a maximum slope of 3.5%.

.8 Provide slip resistant surface materials.

.9 Avoid exterior stairs where possible.

5.13.3 Stormwater Management Pond

Integrate the stormwater management Facility into the overall Site Design as a natural amenity feature, showcasing locally adapted and appropriate wetland, emergent, and shoreline vegetation.

Design planting at the stormwater management Facility considering visual interest, seasonal colour, and pollinator friendliness as part of the overall Design.

Connect the stormwater management Facility to the Site with a 3.0m minimum width pedestrian pathway, with bench seating provided at regular intervals for patients, staff, and visitor enjoyment.

.4 Provide an overlook or other architectural amenity feature, for views and enjoyment of this pond.

5.13.4 Secure Outdoor Courtyards

The Participants will provide two separate dedicated Secure Outdoor Spaces directly accessible from the common areas and/or corridors of the Psychiatry Inpatient Unit. One space is for the Psychiatry Inpatient Unit and the other is for the Psychiatric Intensive Care Unit (PICU).

.2 The Participants will provide one separate dedicated Secure Outdoor Spaces directly accessible from the common areas and/or corridors of the Psychiatric Evaluation and Stabilization Zone in the Emergency Department.

Provide vertical security screens in secure outdoor spaces in any locations along any exposed perimeter that is not contained by a Building exterior wall of over 3000 mm, and as follows:

Provide screen constructed of material that has a non-institutional, decorative appearance. Prevent ligature or other forms of self harm, and be highly impact resistant.

.4 Design raised garden beds with plant material that does not permit hiding and allows full body observation. If the raised beds are adjacent to the vertical screen, then the screen shall be increased in height to maintain a 3600mm protection.

.5 Seating nodes accommodating 2-4 people, as well as individual seating spaces are required.

.6 A covered area or free-standing trellis will provide the feeling of an outdoor room. The trellis Design will restrict climbing, prevent ligature, or other forms of self harm and shall have a minimum clear height of 3000mm.

.7 All areas of the Secure Outdoor Spaces will be covered by security cameras.

All areas of the Secure Outdoor Spaces will be lit to a minimum level of 100 lux.

.9 Secure Outdoor Spaces shall be irrigated with a high efficiency drip irrigation system that is inaccessible (i.e. direct burial) from patients and tied into the Building Management System (BMS).

.10 At least one hose bib, and one electrical outlet, are required for each secure courtyard. All mechanical appurtenances such as the aforementioned shall be secured, concealed, and Designed such that they can only be activated by staff.

.11 Provide ground surface materials that are solid, immovable, stable and smooth to prevent falls and tripping by patients and staff.

5.13.5 Site Furnishings

Site furnishings shall include a combination of fixed and movable benches, tables, and chairs, bollards, bike racks, waste and recycling receptacles, smoking ash trays, and Site lighting.

Provide Site furnishings that are not easily disassembled or destroyed such that components could be used as weapons.

Site furnishings shall be selected based on appearance, form, function, durability, weather resistance, accessibility, user comfort, and support.

.4 Seating and rest area nodes are encouraged every 40m.

Waste Receptacles are encouraged every 20m.

5.13.6 Landscape Maintenance

Landscape Maintenance shall begin upon installation as 'Establishment Maintenance' as per the Canadian Landscape Standard (CLS). Establishment Maintenance shall continue until the end of the Defect Correction Period.

.2 Lawn areas of the Project will be mowed a minimum of 4 times before handing over the lawn maintenance to the Owner.

.3 All landscape areas other than lawn will be maintained by the Participants until Substantial Completion. This includes all planted areas (e.g. courtyards, buffer areas). Snow removal is excluded from the landscape maintenance obligations.

Landscape Maintenance shall be level 'Well Groomed' as per the CLS (Canadian Landscape Standard).

The Participants shall warrantee the plant material until Substantial Completion. 100% of the installed plants shall be alive and thriving.

.6 The ALT has the ultimate decision on the health or replacement of the plant material. All plants deemed dead or showing decline shall be replaced immediately. All replaced plants shall have a warranty until the end of the Defects Correction Period.

The Participants shall provide a monthly 'Site Maintenance Inspection Form' as per the CLS for monthly inspection. Failure to provide the form shall have a direct bearing on payments.

5.14 Heliport Design

5.14.1 Overview and Goals

The intent of this section is to provide all pertinent information to allow the Participants to bid on and install a complete Heliport, however, it is the responsibility of the Participants to propose in their bid any and all items required to provide a certified Heliport if not identified in this Schedule 2.

.2 The Heliport is a critical part of the Facility, the Design of which involves collaboration with most disciplines including but not limited to architectural, mechanical, civil, structural, electrical and ICAT.

The Heliport will be located and designed to allow for the highest level of usability and safety for helicopter operations. Environmental factors including wind must be factored into the Facility design to ensure maximum usability is attained.

.4 The Owner's heliport representative will be responsible for providing documentation and arranging testing with Transport Canada to meet certification requirements. This section contains detailed document and reporting responsibilities for the Participants to assist in navigating through the Transport Canada certification process. Meeting Transport Canada document submission timelines is critical. This will require the Participants to implement and maintain a high degree of coordination and collaboration with the Owner.

5.14.2 General Scope

This section defines the Heliport and related systems.

.2 This section also outlines the Heliport requirements that may not be addressed by the applicable codes and Standards.

.3 Related Sections: The following sections are included for reference only and will not be presumed complete:

Refer to Section 5.12.5 – Design Loads

Refer to Section 7.3 – Plumbing

Refer to Section 7.2 – Fire Suppression

Refer to Section 7.7 – Communications

Refer to Section 4.6.3 – Storm Sewers and Drainage – On-Site

Refer to Section 5.12.7 – Vibration Limitations

Refer to Section 6.10.2.5 – Acoustic Treatment

h) Refer to Section 7.8 – Electronic Safety and Security

5.14.3 Submittals

Submittals will be provided to the Owner's heliport representative.

Product Data Sheets: Submit product information for all work.

Certificates:

Engineering certification of the Heliport load bearing capacity and point loading.

b) Engineering certification of the Heliport fuel containment capacity.

c) Engineering certification the safety net meets the minimum loading.

Certificate of compliance that the foam discharge rate meets CAR Standard 325 and NFPA 418.

Certificate of compliance that the foam used in the Heliport fire suppression

system meets CAR Standard 325.

Certificate of compliance (in the case of an aluminum deck) that the Heliport deck aluminum has been tested and has passed ASTM test methods pursuant to NFPA 418 and with reference to Transport Canada AC 305-002.

Verification the installed foam suppression system meets the required Standards and with reference to Transport Canada AC 305-002, NFPA412, NFPA 11, NFPA 16, NFPA 25, the manufacturer's guidelines and to the satisfaction of Transport Canada, and specifically:

Water/foam flow volume;

Foam physical characteristics including solution concentration, foam expansion and foam drainage time; and

The foam will be sampled during foam suppression pre-test and during the Transport Canada foam suppression system test.

The Heliport will conform to all applicable legislation, codes, Standards, regulations and guidelines for mechanical and electrical systems, structural, material, Construction, airspace, dimensions, Design and documentation.

5.14.4 Transport Canada

The Owner's heliport representative will be the point of contact with Transport Canada.

.2 This does not preclude the Participants from making submissions to or contacting Transport Canada directly for interpretation of Standards and regulations.

Should the Participants contact Transport Canada relating to an aspect of the Project, the Participants will record and provide copies to the Owner's heliport representative of any correspondence or communications with Transport Canada.

.4 For greater certainty, the following table provides a list of the document submissions, inspections anticipated, interim timelines and the entity responsible for Transport Canada contact. The Participants will be responsible to coordinate and meet all timelines identified in the table.

Requirement	Entity Responsible to Prepare/Schedule/ Advise	Entity Responsible to Submit/Advise Transport Canada	Timeline
Initial application	Owner	Owner	Completed
Letter of Non-Opposition from City	Owner	Owner	Completed
Heliport Foam & Leak Test Completed and Ready for Inspection	The Participants	Owner	1 month Prior to foam test
Foam test date provided	The Participants	Owner	6 months

(foam test will occur a minimum 1 month prior to Transport Canada certification date)			Prior to certification date
Engineering load-bearing report	The Participants	Owner	3 months Prior to certification date
Engineering fuel/foam/water containment tank capacity report	The Participants	Owner	3 months Prior to certification date
ARCAL frequency assigned	Owner	Owner	4 months Prior to certification date
CFS Submission	Owner	Owner	4 months Prior to certification date
Heliport Operations Manual submitted	Owner	Owner	4 months Prior to certification date
H1 survey and obstacle assessment	Owner	Owner	4 months Prior to certification date
Aerial Assessment Scheduling	Owner	Owner	3 months prior to assessment date
Aerial Assessment Helicopter Booking	Owner	Owner	2 months prior to assessment date
Aerial Assessment Planning Complete	Owner	Helicopter Operator & Owner	2 weeks prior to assessment date
Safety Personnel Training completed, and records submitted	The Participants	Owner	4 months Prior to certification date
Certification Date Scheduling	The Participants	Owner	6 months Prior to certification date

The Participants will:

Prepare and forward direct to Transport Canada, all required Aeronautical Assessment Forms (AAF) for Buildings, structures and cranes being built or

erected by The Participants;

Meet AAF submission timelines and provide copies of all submissions to the Owner's heliport representative;

Provide to the Owner's heliport representative dates when the Heliport components will be ready for inspection; and

Ensure and provide confirmation to the Owner's heliport representative that all aspects of the Heliport components to be inspected are ready prior to the assigned inspection date.

5.14.5 Aerial Assessment

A day and night aerial assessment by Transport Canada will be conducted during certification. The helicopter charter company and helicopter will be selected by the Owner's heliport representative and approved by Transport Canada. The cost of the helicopter charter will be a Reimbursable Cost to the Participants.

The Participants will:

Have completed all works and Construction activities related to the Heliport prior to the aerial assessment;

b) Have completed both the foam suppression system pre-test and passed the Transport Canada foam test prior to the aerial assessment;

c) Ensure that all Construction debris on the Inpatient Tower roof has been disposed of and all installations are secure and will withstand the rotor downwash prior to the aerial assessment; and

Ensure that all lighting is operational and there is no foreign object debris (FOD) on the roof prior to the aerial assessment.

The Participants will ensure the Owner's heliport representative is provided all documentation required for the aerial assessment, including but not limited to:

Engineering certification that the Building and Heliport are structurally sound and can accept the weight of the helicopter; and

Evidence that the Heliport fire suppression system has been tested and is fully operational.

5.14.6 Nav Canada Land Use Submission

The Participants will:

Prepare and forward to Nav Canada, all required Land Use Submissions related to the Buildings and structures being built and cranes erected by the Participants;

Request and maintain Notices to Airmen (NOTAM) through Nav Canada for tower and mobile cranes and any other Construction equipment and activities as identified in the Nav Canada NOTAM Procedures Manual as being the responsibility of the equipment Owner or operator; and

Meet all submission and NOTAM timelines and provide copies of all submissions and NOTAMs to the Owner's heliport representative.

5.14.7 Location and Design

The Heliport will be an H1 classification, Designed for day and night operations.

The Heliport will be positioned on the roof of the Inpatient Tower.

The Heliport will be positioned to allow adequate lateral clearance to accommodate a secondary egress stairway from the Heliport Touch Down and Lift-Off Area (TLOF) to the roof, located on the opposite side of the TLOF from the elevator vestibule ramp.

.4 The Heliport deck may be sloped a maximum 2.0% for the purpose of fuel drainage. The low side of the slope will be at the opposite end of the TLOF from the vestibule ramp.

A minimum 4.0 m clear air gap or greater if determined by wind tunnel testing, will be provided beneath the TLOF deck. The air gap will be measured between the lowest part of the underside of the TLOF deck and the top of the roof parapet, if adjacent a building roof edge.

Meteorological analysis and wind tunnel testing shall be conducted in respect to turbulence over the Heliport deck with the standard deviation of the vertical airflow velocity of 1.75 m/s not exceeded; and

b) Vertical airflow velocity testing shall reach to a minimum of 100 feet above the Heliport deck.

.6 The Heliport deck will meet the specifications in NFPA Standard 418 and CAR Standard 325 with reference to AC305-002 Rooftop Heliport Firefighting Protection.

In the case of an aluminum deck, acceptable Heliport deck manufacturers are listed in5.14.24; and

The deck will be Designed with a non-slip, non-reflective coating.

.7 A ramp connecting the Heliport deck with the elevator vestibule will be a minimum width of 2.6 metres with the same characteristics as the TLOF deck. It will:

Have sufficient edge protection to prevent stretcher wheels from rolling over the edge;

Have centreline and edge marking of a contrasting colour to that of the ramp surface;

c) Have a maximum longitudinal slope of 5%, with a minimum upward slope from the Heliport deck to the vestibule of 1.5% for the first 3.3m;

Have a maximum lateral slope of 1%; and

Be Designed with a non-slip, non-reflective coating.

.8 TLOF Egress Stairways

There will be a minimum of one egress stairway from the TLOF to the roof;

b) The egress stairway will be located on the opposite side of the TLOF from the elevator vestibule ramp.

The location and characteristics of this egress stairway shall meet the requirements under CAR standard 325 and NFPA 418 (2021);

The TLOF egress stairway shall be open grate tread, galvanized or aluminum, that shall provide a non-slip surface with minimal snow or ice accretion.

Heat trace shall be installed if tread Design does not ensure a snow and ice-free surface;

High-visibility, non-slip step edge marking shall be provided on all stairways leading from the TLOF; and

f) Railings shall be installed on each egress, ensuring the railing remains flush or below the TLOF level. For the sections of the stairways that do not have the

clearance for installation of a railing, safety netting shall be installed that meets Standards and otherwise specified in this Schedule.

.9 Glycol Heating System

The Design will include a glycol under deck heating system for the TLOF and ramp;

The Design will ensure snow and ice melt considering the winter temperatures and wind conditions;

The glycol tubing installation will be protected from the elements to ensure heating energy is not lost; and

The glycol heating system shall be connected to the Facility mechanical and Building automation systems.

5.14.8 Dimensions

The Heliport Final Approach and Take-off Area (FATO) and Safety Area declared dimensions will be based on a Design helicopter with an overall length of 18.3 m.

The Final Approach and Take-off area (FATO) will have a minimum dimension of 27.45 m x 27.45 m

The Safety Area will have a minimum dimension of 36.60 m x 36.60 m

c) The TLOF will have a minimum load bearing (solid-surface) dimension of 21.5 m x 21.5 m

5.14.9 Design Loads

.1 Refer also to Section 5.12.5 – Design Loads.

.2 The Heliport will be Designed for a helicopter static weight of 84.52 kN (19,000 lbs) times a factor of 1.5 for landing impact (dynamic load).

Point loading for a Leonardo AW139 will be calculated for the dynamic load.

5.14.10 Safety Netting

Safety netting will Project a minimum of 2.0 metres beyond the edge of the TLOF, ramp edges and any fuel containment gutter. For greater certainty the measurement will be the horizontal distance and does not include the outer framework of the safety netting.

.2 The TLOF egress stairway will have safety netting of the same dimensions as 5.14.11.1, installed where railings are not present.

The safety netting materials will be galvanized steel or aluminum with a minimum load rating of 122kg/sqm.

.4 If larger safety netting is required by OHSA, the safety netting will meet those Standards.

5.14.11 Flight Paths and Obstacle Limitation Surface (OLS)

A 360-degree H1 classification Obstacle Limitation Surface (OLS) will be designed.

.2 Two 90 degree opposing flight path arcs within the H1 OLS will be designed to meet the following requirements:

They will be aligned with and include the prevailing winds. For greater certainty, the prevailing winds are from the west-northwest and east-southeast.

They will be obstacle free with a 0% slope measured from the edge of the declared safety area. The obstacle free area will only apply to the Facility property.

With the exception of the Heliport elevator vestibule and the area behind and shielded by the vestibule, there will be no Buildings or obstacles Designed or erected by the Participants higher than the Heliport deck.

5.14.12 Building Rooftop Installations

.1 Pedestrian surfaces will be installed on the route from the secondary TLOF egress stairway to the rooftop access stairwells.

Pedestrian surfaces will be open grate tread, galvanized or aluminum, that will provide a non-slip surface, minimal snow and ice accretion and ease of snow clearing.

.2 Roof walkway guidance markings and lighting will be provided to direct persons from the secondary TLOF egresses to the rooftop access stairwell.

Building edge railings will be installed along the Heliport egress routes as required by code or otherwise stated in this Schedule.

.4 There will be no antennas or other protrusions other than those required for Heliport operations, located on the Inpatient Tower roof.

.5 All rooftop installations, extrusions, fittings and roof covering will withstand ongoing exposure to helicopter rotor downwash. Roof coverings that shed gravel, grit or other particles are not suitable.

.6 A Fall Arrest System will be provided on the roof and TLOF for use of workers to use during maintenance of the heliport systems and heliport.

No obstacles, including any attachments to the elevator vestibule exterior walls and doors, both open and closed, ramp and railings shall penetrate the safety area, unless allowed by Standards and otherwise specified in this Schedule.

.8 The Participants will ensure furniture, landscape materials and accessories in all Facility outdoor spaces (patios/courtyards/amenity spaces) and green roofs within a 30 metre vertical distance of the Heliport deck are Designed to be unaffected by helicopter rotor downwash.

Facility outdoor spaces that fall within these parameters will be equipped with an audible warning directing persons to shelter inside during helicopter arrivals and departures;

The audible warning will be configured to be activated remotely by heliport security personnel;

c) Rotor downwash for the Leonardo AW139 will be considered.

.9 The Participants shall provide two rooftop stairwells that can access and lead to the TLOF egress points.

.10 All rooftop installations and materials will minimize glare from sun reflection. Refer to 6.7.2.6a)ii).

5.14.13 Elevator Vestibule

The following features will be provided within the elevator vestibule:

A work-station suitable for installation of portable radios, permanent radio base station, AC receptacles, telephone for internal and external calls, IP wall-mounted video monitor and desk with space for document filing and a writing surface;

A washroom including sink and toilet;

A separate hand wash sink shall be provided in the vestibule along with receptacles for the disposal of contaminated Personal Protective Equipment (PPE), PPE dispensers and helicopter disinfection and cleaning materials used by pilots or flight paramedics;

A Utility Room-Fire Suppression, suitable to store all equipment required by the North Cowichan Fire Department (NCFD).

A Utility Room-Storage, suitable to store all Personal Protective Equipment (PPE) required for use by safety personnel, pilots and flight paramedics.

The vestibule will be provided with the following Design features:

a) Windows on each side to allow for viewing all quadrants of the approach/departure paths.

Viewing the TLOF can be through windows integrated in the ramp doors;

All windows will be designed to withstand helicopter rotor downwash and provide noise mitigation. Refer to 6.9.4.12; and

All windows will be Designed to eliminate interior window reflections and for viewing heliport during night operations.

Interior vestibule lighting shall be able to be switched to dimmable red lighting during night helicopter approaches and departures. Night lighting shall be Designed to not affect pilot's night vision or night vision goggle (NVG) operations.

Vestibule Ramp Access Doors will meet the following requirements:

The vestibule entrance doors will be automatic opening, double with a clear opening of 1800 mm;

Exit from the vestibule to the TLOF will be controlled with card readers, locking hardware and hand wave actuator;

Entrance from the TLOF to the vestibule will be with a push button actuator with the doors opening into the vestibule; and

iv) All features will be in compliance with 7.8.2 Access Control System.

The vestibule roof will not extend any higher than required for provision of elevator mechanical system requirements.

e) No additional antennas or extrusions other than those required for Heliport operations will be installed on the vestibule roof.

A Fall Arrest System will be provided on the roof for use by all workers that may have to access or service roof mounted installations.

Exterior vestibule cladding will be of a colour and surface texture that will not reflect sunlight or helicopter landing lights to prevent dazzling for pilots.

h) Interior vestibule will be arranged in such a manner that all controls, including but not limited to lighting control, foam suppression activation and shut off switches, foam countdown timers, fire alarm pull stations and video monitor are in a location that allows for simultaneous viewing of the TLOF and activation or monitoring of these installations.

i) The vestibule shall have a fire separation from the Heliport landing area that conforms to the National Fire Code (NFC).

No portion of the vestibule, vestibule doors when open or closed or any attachments or fixtures mounted on the vestibule or walkway will penetrate the safety area.

5.14.14 Acoustic Treatment and Vibration Isolation

The performance criteria in Section 5.12.7 – Vibration Limitations and Section 6.10.2.5 – Acoustic Treatment will apply to helicopter noise, rotor downwash and vibration transmitted through the Heliport deck from helicopter landings and ground running.

.2 The Heliport deck will be designed with vibration isolation devices for vibration control.

The Participants will be responsible for acoustic and vibration testing during live helicopter landings and ground running which can occur in conjunction with the helicopter aerial assessment conducted during the Transport Canada certification inspection. The helicopter charter company and helicopter will be selected by the Owner's heliport representative. The cost of the helicopter charter will be a Reimbursable Cost.

5.14.15 Video Surveillance

Refer also to Section 7.8 – Electronic Safety and Security

.2 The elevator vestibule will be equipped with CCTV cameras providing views of the TLOF, flight path quadrants and vestibule interior. All cameras are to be connected to Protection Services Dispatch centre and will be displayed at the local protection services workstation and from a monitor in the vestibule.

5.14.16 Communications Equipment

.1 The Participants will equip the Heliport with portable radios and a permanent base station. It will be used by security personnel to communicate with the aircrew on helicopter approaches and departures. The Heliport communication system will integrate with the existing radio communications systems, frequencies and radio types which are in use and approved by the Owner's heliport representative. The Participants will install the following provisions for the communications system:

Antenna mounted on the Heliport elevator vestibule roof;

Antenna cable run from the antenna to the location within the vestibule where the radio will be mounted;

c) The radio mounting location will be such that the radio operator can view the Heliport deck while operating the radio;

Linear 12V DC 15 amp continuous power supply connected to a 120V AC receptacle at the radio mounting location;

Additional radio speaker and wiring shall be provided and installed at a location inside the vestibule and remote to the radio location that will enable radio transmissions to be heard throughout the vestibule.

.2 The radio must be installed and operating prior to the Transport Canada certification inspection and aerial assessment.

.3 Weather Sensing and Reporting System

The Participants will provide a weather sensing and reporting system which will be a complete "turn-key" solution including all hardware and software. Sensors shall consist of separate components allowing for ease of maintenance, service and recalibration;

Weather sensing shall include ambient air temperature, relative humidity, wind direction and speed;

The system shall be Designed to meet the expected environmental conditions expected at the Site, including heated sensors for cold weather operations;

The tower shall be Designed and installed to withstand the environmental conditions expected at the Site;

The tower shall hinge to allow for ease of maintenance, service and recalibration of components; and

The tower shall be installed on the elevator vestibule roof at the point farthest from the TLOF.

d) The weather reporting system output shall be able to be accessed over an internet connection;

The weather reporting system output shall have a screen display mounted within the vestibule that can be viewed by heliport personnel.

.4 The Participants will ensure conditions are in place such that electromagnetic radiation from the Heliport installations are within acceptable limits per CSA guidelines to protect proper functioning of medical equipment onboard the helicopter and not cause interference with any medical equipment within the Facility. Refer to CSA 60601-1-2.

5.14.17 Building Exhaust Outlets, Chillers, Cooling Towers and Air Intakes

Hospital exhaust outlets, chillers and cooling towers will not be located under or near the Heliport flight path in such proximity that may cause condensation, obscuring of visibility or turbulence, that may affect the safety of flight operations.

a) The assessment of turbulence of the plumes from the exhausts located near the Heliport will be conducted to confirm they will not affect airflow patterns within the two 90degree flight paths; and

Vertical airflow velocity testing shall reach to a minimum of 100 feet above the Heliport deck elevation.

Building fresh air intakes will be located and Designed to not entrain contaminants from helicopter exhaust during Heliport operations.

5.14.18 Heliport Lighting

The Participants will provide all lighting and electrical systems for the Heliport in accordance with applicable Standards.

Heliport lighting, connectors, wiring and hardware will be appropriate to the Design and in accordance with lighting manufacturer's recommendations and all applicable codes.

Heliport lighting, signage and lighting control will be connected to emergency power.

.4 Any lighting required to remain activated during night operations shall be shielded or otherwise not affect pilot's night vision or the use of NVGs.

TLOF perimeter lighting will be LED, NVG compliant, variable intensity, green in colour and meet CAR Standard 325 with reference as applicable to TP 312 5th Edition, ICAO Annex 14 Volume II and FAA AC 150/5345-46. For the purpose of TLOF lighting specifications, the TLOF and FATO will be considered coincidental and lighting will not exceed "Medium" intensity.

TLOF perimeter lights will be equally spaced a maximum 3.0 metres apart,

ensuring that the spacing is not compromised by the ramp and secondary egress stairway;

Intensity control will be provided for the TLOF lighting with three intensity levels that are acceptable to Transport Canada;

Aircraft Radio Control of Aerodrome Lighting (ARCAL) Type K will be installed for the activation and intensity control of TLOF perimeter lighting; and

A manual over-ride switch shall be provided within the lighting control panel to allow testing of the TLOF lighting and intensity control.

.6 Provide white auxiliary exterior flood lighting of the TLOF and connection ramp for patient transfer from the Heliport to the dedicated elevators and for maintenance purposes. The lighting fixtures are to be installed on the vestibule walls or roof. Manual activation by safety personnel of the white lighting will be provided with a dedicated switch located in the vestibule control panel.

.7 Provide white auxiliary exterior flood lighting installed on the vestibule walls or roof to illuminate all quadrants of the roof. Manual activation by safety personnel of the white lighting will be provided with a dedicated switch located in the vestibule.

.8 Provide auxiliary white edge lighting for the TLOF to vestibule connection ramp, sufficient to identify ramp edges.

Provide auxiliary white lighting for the Heliport secondary egress stairway.

Lighting for the ramp and secondary egress is to be LED, directed downwards, shielded from the helicopter pilots view and subdued to prevent dazzling for night NVG or unaided operations. Lighting is to be activated automatically by photoelectric control with manual override.

.11 The lighting system will include a control panel located inside the vestibule adjacent the ramp doorway or at a suitable location that will allow simultaneous viewing of the TLOF and activation of control panel switches.

a) The control panel will have separate on/off switches and activation indicator lights for the following circuits:

TLOF perimeter lights with a manual over-ride switch to allow testing of the TLOF lighting and intensity control;

TLOF and ramp floodlights for patient transfer;

Floodlights for roof illumination; and

Manual override to the automatic photo electric activation for ramp and secondary egress guidance lighting, both on the same circuit.

.12 Guidance lighting will be provided along the route from the secondary TLOF egress to the rooftop access staircore. The lighting will:

Be subdued, shielded or otherwise not affect pilot's night vision or the use of NVG.

Project down and not be affected by snow accumulation or environmental conditions.

Be activated automatically by photocell.

.13 Provide internal lighted exit signage for ramp, secondary egress and rooftop access stairways. Ramp and secondary egress exit signage will be visible from the Heliport centre. Signage lighting will be activated by photoelectric control or on 24/7.

5.14.19 Obstacle Marking and Lighting

The Participants will:

Complete all obstacle marking and lighting at the facility and assess for marking and lighting all off-site obstacles to 1000 metres as required by CAR 305, Standard 325, Standard 621 and Transport Canada.

Provide the Owner's heliport representative with an obstacle marking and lighting plan for approval, prior to marking or lighting installation.

Install obstruction lighting in compliance with CARs Standard 325 and Standard 621, utilizing CL810 dual red LED lamps, NVG compliant with both lamps illuminated simultaneously, 24/7.

5.14.20 Visual Aids

The Participants will provide all visual aids as required by Standards.

.2 Warning Signs

The Heliport will have helicopter warning, restricted access and no smoking signs installed inside and outside each Building roof egress and inside and outside the vestibule;

b) Fire extinguisher signs or appropriately marked cabinets are to be visible from the TLOF and vestibule; and

"No Drone Zone" signs will be installed at strategic ground level locations surrounding the hospital property and visible to the public when approaching the Facility. The "No Drone Zone" signs will be of a form similar to that provided to airports by Transport Canada.

.3 Heliport Closed Banner

a) A heliport closed banner will be provided that meets CAR Standard 325; and

The banner can be securely installed on the Heliport deck to identify short term Heliport closures.

.4 Wayfinding

In consultation with NCFD, yellow guidance lines shall be painted on the interior floors and stairs that lead to the rooftop access points, for guidance when NCFD is responding to a heliport incident.

Wind Direction Indicator

The Participants will provide an internally lighted wind direction indicator (WDI) on the vestibule roof that will:

Be visible from the TLOF;

Be of a Design that allows for lowering of the WDI for service and maintenance;

Be visible from the centre of the TLOF and located a sufficient distance from the rood edge to comply with OSHA Standards; and

Have a CL810 dual red LED, NVG compliant obstruction light installed on the WDI with both lamps illuminated simultaneously, 24/7.

5.14.21 Fire Protection

The Participants will:

Provide all required fire protection and fire suppression equipment for the Heliport. Fire protection systems shall comply with CAR Standard 325, NFPA 418 and referenced codes.

Consult with the North Cowichan Fire Department (NCFD), on the Heliport Fire Protection design and ensure NCFD is satisfied with the Heliport Fire Protection. Specifically, NCFD must be satisfied that the Heliport and Facility fire protection will be sufficient to enable NCFD to fight a helicopter fire occurring on the Heliport deck or on the roof of the Inpatient Tower. The Owner's heliport representative will be included in the consultation with the NCFD.

In addition to the requirements in this Schedule, provide any additional standpipes, foam capacity and appliances and helicopter crash equipment as requested by and for the use of the NCFD.

Be responsible for scheduling, performing and all costs related to Heliport foam fire suppression testing prior to and as part of the Heliport certification process.

Conduct testing of water and foam discharge to confirm the integrity of the catchment, drainage and containment system and the correct adjustment of the system, to the approval of the Owner's heliport representative and prior to Transport Canada attendance for the certification foam test.

Provide training opportunities and orientation to the NCFD on the fire protection system and suppression equipment.

g) Provide a combined fuel/foam/water containment tank, a fuel containment berm on the perimeter of the TLOF and diverters to ensure 100% catchment of the fuel load of the largest helicopter that can use the Heliport. Fuel slosh from a ruptured fuel tank will be considered in the containment Design.

.2 Above ground flammable liquids, compressed gas, medical gas and liquified gas tanks and exposed natural gas supply valving will not be situated within or below the Heliport flight paths, within 150m from the FATO edge.

.3 The contiguous Building roof cover within 50 feet (15.2 metres) of the TLOF edge will have a Class A fire resistance rating for exterior fire exposure.

.4 Electric heat tracing for freeze protection will be provided for all mechanical piping, drainage or other system components that may be subject to freezing temperatures.

Self-regulating heat tracing cables will be used that will be compatible with the products with which they may come into contact with;

Heat tracing temperature controllers will be used to ensure that heat tracing is turned off when the temperatures are above freezing, and mounted in locations that minimize their exposure to damage and spilled fuel;

Heat tracing circuits will be equipped with pilot lights that indicate when the heat tracing is energized and will be located where they will be visible from inside the heliport elevator vestibule.

All components of the Heliport Fire Protection System will be connected to emergency power sources.

.6 The TLOF will be Designed with:

Fuel tight deck that prevents fuel from reaching the Heliport support structures or rooftop;

100% water and fuel tight fuel containment gutters, connection joints and plumbing, employing petroleum resistant and fire rated materials;

In the case of an aluminum deck, a Deck Integrated Fire Fighting System (DIFFS) with foam deployment;

In the case of an aluminum deck, a passive fire protection grid surface (passive fire retarding surface);

A fuel containment berm no higher than 7.5cm around the perimeter. The berm may also serve the purpose of containing or redirecting foam from a foam deployment; and

TLOF to ramp and TLOF to secondary egress connections that prevent fuel from a ruptured fuel tank crossing into these entry/exit points. Grating over a perimeter fuel containment gutter or alternate method will be used.

.7 A TLOF foam system will be provided that will:

Be a dry system that is freeze protected and equipped with sufficient low point drains to maintain dry system integrity by allowing drainage of residual water or condensation from piping.

Be Designed for full deployment of water and foam occurring within 15 seconds of switch activation.

Cover the entire TLOF surface for a duration of ten minutes.

Deploy by foam activation switches that are clearly labelled, yellow in colour to be easily distinguishable from a Building fire alarm pull, and located:

Inside and outside the elevator vestibule ramp doors;

At the secondary egress from the TLOF;

Be connected to the Building fire alarm; and

Be Designed with a foam shut off switch located in the Heliport vestibule, which will be easily accessible and clearly labelled.

.8 The Participants will ensure 100% containment of foam during any TLOF foam activation.

No foam shall enter the municipal storm drain system; and

Containment must be effective and to the satisfaction of the AHJ.

A separate foam supply will be provided for connection to a standpipe and hose for use by NCFD first responders.

a) The standpipe will be located inside the elevator vestibule adjacent the ramp doors or at a location identified by the NCFD;

The standpipe location will not interfere with stretcher movement within the Heliport vestibule;

Activation switch will be provided adjacent the vestibule standpipe or at a location identified by the NCFD;

The standpipe foam system will be Designed with a foam shut off switch located in the Heliport vestibule, which will be accessible and clearly labelled;

The capacity of the foam supply will allow for a minimum of five minutes of foam/water discharge or a greater capacity if required by NCFD; and

Be connected to the Building fire alarm.

.10 Both foam systems shall have countdown timers and activation audio alarms installed within the vestibule. The countdown timers will be sized to allow for easy viewing and

which indicate the foam deployment time remaining in each system. The displays shall be red LED, easily visible during the day with night dimming capability.

The Participants will provide portable fire extinguishers that meet 10A-120B specifications and be:

Secured within weatherproof cabinets, red in colour and marked in such a manner that clearly identifies the contents; and

Installed inside and outside the Heliport vestibule, outside the secondary TLOF egresses and outside the secondary roof access stairwells.

.12 Dedicated fire alarm pull stations will be provided in the vestibule and at each roof access location. All dedicated fire alarm pull stations will be red and clearly labelled.

.13 Pull stations located in outdoor locations will be equipped with clear view weatherproof covers that are suitable for the expected weather conditions.

.14 A drainage system will be provided and Designed such that:

When the heliport is not in use, stormwater from the TLOF catchment system will be directed to roof drains; and

When the heliport is in use, the surrounding roof drains within 10.0m of the TLOF edge to be directed/valved to a combined fuel/water/foam containment tank by way of manual activation from the vestibule, automatic activation with the heliport lighting system and automatic activation with the foam suppression systems.

.15 The combined fuel/water/foam containment tank will be provided and will meet the following requirements:

Effective capacity determined by hydraulic calculations to include water/foam mixture from the deck foam nozzles and foam standpipe activations, helicopter fuel load, rainfall occurring during a foam activation occurrence in accordance with MNC Storm Water and Rain Water Design Guidelines and deck and roof wash down water to remove all foam.

A helicopter fuel load of 3,000 litres;

Below ground installation and located in such a manner that it can be easily emptied from grade;

Appropriate ULC listings and be equipped with inlet port(s), vent(s) and suction outlet port(s) to allow for pumper truck suction at a remote suction port external to the Building;

Submersible pump(s) or drains with non-return and isolation valves to allow discharge of rainwater not contaminated by foam or fuel, to the storm system;

Designed to allow testing for contaminants prior to pump out or discharge to Site storm system;

The tank will have mid and high level liquid sensors that will initiate alarm conditions to a local alarm panel to the BMS;

Designed to prevent back flow into the Facility and Site storm system; and

Containment tank and all related piping, fittings, connections and equipment that may come into contact with fuel shall be petroleum rated.

5.14.22 Manufacturers

Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

In the case of aluminum heliport deck and systems:

Bayards Aluminum Constructions; https://www.bayards.com/en/

Aluminum Offshore; https://www.aluminium-offshore.com

Weather Station

Campbell Scientific; https://www.campbellsci.ca/

6 FACILITIES CONSTRUCTION SUBGROUP SPECIFICATIONS

6.1 Procurement and Contracting Requirements (Division 1) – NOT USED

6.2 Existing Conditions (Division 2) - NOT USED

6.3 Concrete (Division 3)

6.3.1 Basic Requirements

Design and construct cast in place or precast concrete of appropriate properties for the intended use in accordance with the BC Building Code, CAN/CSA A23.1/A23.2, A23.3, A23.4, S413, all requirements of all applicable codes and Standards, and these specifications.

.2 Design for the applicable concrete exposure class and provide high sulphate resistant performance where applicable.

.3 The structural engineer of record will review concrete reinforcing and mix Design shop drawings, perform Construction field review of concrete reinforcing at sufficient frequency, and review inspection and materials test reports to confirm that the Building structure has been constructed in substantial conformance with the approved Construction documents.

.4 Use of fly ash or other supplementary cementitious materials is encouraged but will be limited to 25% of cementitious materials by mass except as follows:

40% for footings, piles, walls and columns;

b) 20% for slabs receiving ground and polished finish where densifier and hardener is used; and

c) 0% for concrete subjected to saturated freeze-thaw cycles or de-icing agents.

Use wood formwork for cast in place concrete, in accordance with Appendix 2B – Wood First Appropriate Matrix.

Proportion reinforcement of concrete elements to meet or exceed strength Design requirements, durability, serviceability, and the minimum steel area requirements as outlined in applicable codes and Standards.

.7 All concrete elements, including topping slabs, will be reinforced. Sufficient reinforcement will be provided in all concrete elements to accommodate the applied loading and to provide crack control, such that crack widths are limited in accordance with the intended importance (visual and physical) and finish of the structural elements.

Provide a durable concrete floor finish, including the use of sealers and hardeners as required to meet the anticipated use and occupancy.

.9 Post-tensioned reinforcement will not be used as a reinforcing element in any structural member.

Precast hollow-core slabs (or equivalent systems) will not be used for the Facility.

.11 Fill all bug holes, and forming marks on cast concrete walls, to provide a smooth substrate for paint finish.

6.3.2 Quality Requirements

Cast in place concrete and concrete materials are to be inspected and tested by a CSA certified testing laboratory in accordance with CAN/CSA A23.1/A23.2.

Precast concrete materials to be inspected and tested by a CSA certified testing laboratory in accordance with CSA A23.4. Maintain plant records and ensure quality control as required by CSA A251 and in accordance with this specification.

The precast concrete manufacturer will be a current member of the Canadian Precast/Prestressed Concrete Institute (CPCI).

.4 Precast concrete materials and workmanship to be inspected and tested by the precast concrete manufacture as part of its quality control program in accordance with all applicable Standards.

.5 Place, support, and secure reinforcement within tolerances and against displacement in accordance with CAN/CSA A23.1 and to Design requirements. Ensure that any welding of reinforcement is performed by individuals certified by the Canadian Welding Bureau under the requirements of W186.

.6 For reinforcement from Canadian manufacture, provide a certified copy of the mill test reports for reinforcing steel showing physical and chemical analysis. For reinforcement from other than Canadian manufacture, provide test data from a Canadian Testing Laboratory proving that each size and grade of reinforcement meets the Standards set out in these Design and Construction Specifications. The acceptability and use of non-Canadian manufacture reinforcement is at the sole discretion of the Owner .

.7 Embedded hardware will be tested by a suitably experienced, independent testing agency in conformance with all applicable CSA Standards.

.8 The Participants will provide a detailed shoring and re-shoring of formwork proposal submittal to the Owner. Surveys of top of formwork prior to pour and top of slab immediately following finishing of the slab as well as immediately following the initial release of the shoring under the slab prior to re-shore shall be provided by the Participants to the Owner as the Alliance Works progresses. A further survey using the same survey points will be provided 3 months following the removal of shoring for the slab.

6.3.3 Performance Criteria

Finish concrete floors with a smooth, dense, steel trowel finish with a Class F2 Flatness Classification in accordance with CAN/CSA A23.1/A23.2, except where more strict requirements are needed to suit the proposed floor covering, occupancy, or equipment that will be located in the space. Overlay toppings to level floors will not be used.

.2 Adhere to all manufacturer guidelines and recommendations for the use, application, and maintenance of sealers, hardeners, and such.

.3 Repair cracks in concrete floors and walls to suit the floor finish and long-term serviceability requirements of the floor.

.4 Water proof all foundation walls for below-grade occupied spaces and crawl spaces to prevent groundwater ingress. Waterproofing will include but not be limited to exterior-applied water-proofing from top of footing or pile to exterior grade level for all below-grade exterior foundation walls and retaining walls. All Construction joints will have

purpose-made water stops tied in place prior to concrete pours. A perimeter drainage system will be installed around any below-grade spaces and additionally as directed by the geotechnical consultant.

Provide weeping tile as required to ensure proper drainage of the sub surface foundations and walls.

The Participants will ensure that expansion, movement and seismic joints are water and vapour tight and excluded from areas where aseptic conditions need to be maintained, located along partition lines and across corridors to limit their impact on trolley, wheelchair and patient stretcher traffic.

.7 All concrete exposed in areas used by staff, patients or public will be architectural concrete.

Exposed architectural concrete will comply with CAN/CSA A23.1/23.2 to minimize honey combing or patching and achieve a smooth and flat surface of uniform colour. Sandblast all concrete exposed to view in public areas on the interior and exterior.

Construct and pour joint locations to minimize disruptions to floor finishes and where possible to run perpendicular to corridors and along partition framing. Where joints cross corridors or passageways, joint covers will be detailed to allow trolleys, wheelchairs, and patient stretchers to pass over the joints with ease.

The Participants will ensure that the structure includes all set-downs as necessary to accommodate all wet areas, including cool rooms, freezer rooms, shower bases and similar areas.

.11 Provide vapour barrier under slabs-on-grade in the form of continuous, cross-linked, minimum 10 mil polyethylene sheet.

.12 See Section 6.5.3.3 for concrete topping on metal deck requirements.

.13 Pharmacy vault ceilings/floor/walls must consist of:

Cast-in-place concrete ceiling/floors: nominal 101mm (4") poured concrete (20.7 MPa (3000 lb/in2) minimum) reinforced with N 5 (15 mm (5/8")) deformed steel reinforcing bars every 20 cm (8") in both directions or reinforced with 3.5 mm (10 gauge) expanded metal mesh which has opening 5 x 2.5 cm (2" x 1"), in accordance with Health Canada Directive On Physical Security Requirements For Controlled Substances, edition 1999.

6.4 Masonry (Division 4)

6.4.1 Basic Requirements

Masonry Construction may be considered for exterior walls and wall systems where permanence of finishes, both visually and functionally, and ease of maintenance are primary considerations in the exterior fabric of the Facility.

.2 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.

Masonry Design and Construction will comply with the Building Code, CSA S304-14, CSA A371-14, and all other applicable Standards.

.4 Unless approved otherwise by the ALT, load-bearing masonry will not be used for exterior walls and wall systems.

All masonry, mortar and grout will be tested by a suitably experienced, independent testing agency in conformance with the code.

.6 Masonry work will be completed by experienced and appropriately qualified placers and foremen.

Masonry work will be built level, plumb and to the dimensions specified in the Construction documents.

Design non-load bearing masonry end connections to accommodate floor/roof deflections and to ensure masonry is not loaded axially.

.9 Design masonry to take into account the anchorage of other materials, equipment, and other secondary loads.

Design masonry to accommodate erection tolerances of the structure.

6.4.2 Concrete Masonry Units

Concrete unit masonry may be considered for both independent exterior walls and in exterior wall systems as a structural backing to other finish materials or systems.

.2 Concrete unit masonry for interior applications may be considered as an integrally finished material, as a base for applied finish, and as a structural backing to other finish systems.

.3 Painted or unpainted concrete unit masonry will not be used as an exposed finish in clinical, inpatient, or public areas.

.4 Where concrete unit masonry is used as the exposed finish, all exposed corners will have rounded or chamfered corners.

In special areas such as Psychiatry, construct walls as required by the British Columbia Ministry of Health Standards for Hospital-Based Psychiatric Emergency Services: Observation Units.

Masonry Design and Construction will comply with the Canadian Masonry Contractors Associate (CMCA) Masonry Practices Manual and all applicable Standards.

6.4.3 Brick Masonry

.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.

.2 Brick masonry below grade for exterior applications is not permitted.

.3 Brick masonry in interior applications is to have integral finish and Construction compatible with the Owner's infection prevention and control requirements.

6.4.4 Stone Masonry

Exterior wall systems comprising stone masonry as a finish veneer to concrete, concrete masonry, or metal framing will be a rain-screen or cavity wall system.

.2 Stone masonry may be considered as a finish veneer to concrete walls or concrete masonry walls. Exterior wall systems in such applications will be a rain-screen or cavity wall system.

.3 Stone will be sound, hard and durable, well-seasoned and of uniform strength, colour and texture, and free of quarry sap, flaws, seams, sand holes, iron pyrites, or other mineral or organic defects.

6.5 Metals (Division 5)

6.5.1 Basic Requirements

Structural steel, steel deck and cold-formed steel stud Design and Construction may be considered for Building elements and systems, where appropriate.

.2 Design and construct steel elements in accordance with requirements of the Building Code, CSA S16, CSA 136, and all other applicable codes and specifications.

.3 Fabrication and erection of all welded structural steel will be completed by a firm certified by the Canadian Welding Bureau (CWB) to Division 1 or 2.

6.5.2 Quality Requirements

.1 Erection tolerances for steel Construction will be in accordance with all applicable CAN/CSA Standards.

.2 All welding will confirm to all requirements of the Canadian Welding Bureau (CWB), as listed in CSA W59, and will be performed by CWB certified welders, in accordance with the requirements of CSA W47.1.

.3 Quality assurance testing and monitoring of materials, connections, and workmanship is to be carried out by an approved independent testing agency using testing procedures as specified in the CSA Standards.

.4 Material quality including sourcing and welding quality will be monitored by an independent testing agency.

.5 The steel deck fabricator will be a current member of the Canadian Steel Sheet Building Institute (CSSBI).

.6 Steel deck workmanship to be inspected and tested by manufacturers as part of its quality control program in accordance with all applicable Standards.

.7 The specification for preparation and painting of structural steel components will conform to Society for Protective Coatings (SSPC) Good Painting Practice and the Master Painters Institute (MPI) Standards as well as be compatible with the final paint finish.

.8 Exposed surfaces will be prepared and finished in accordance with Canadian Institute of Steel Construction (CISC) Guide for Specifying Architecturally Exposed Steel.

Structural steel, which will not receive a finish paint coat and is required to be primed for interior exposure, will be cleaned in accordance with CISC/CPMA 1-73a and CSA Z317.13 as a minimum.

Structural steel to be primed for exterior exposure will be cleaned in accordance with SSPC-SP6/NACE NO.3 – Commercial Blast Cleaning and CSA Z317.13 as a minimum.

6.5.3 Performance Criteria

Design structural steel, steel deck, and cold-formed steel stud systems to comply with the deflection and vibration criteria outlined in Section 5.12 (Structural Design).

For steel floor and roof Construction, the deflection of steel beams, joists, and girders due to the wet weight of concrete topping is to be considered. Topping slab thickness may have to vary to maintain floor levelness tolerances. The additional concrete ponding weight is to be considered in the Design of the structure.

Concrete topping slabs will be finished with a smooth, dense, steel trowel finish in accordance with Section 6.3.3.1. Design and construct concrete topping slabs on steel deck to control cracking and avoid random surface shrinkage cracking and radial cracking around re-entrant corners. Implement concrete Construction and curing procedures to minimize cracking for concrete topping slabs on metal deck.

Pay special attention to crack control of concrete topping on steel deck to avoid random surface shrinkage cracking, cracking over joist/beam supports, and radial cracking around re-entrant corners.

Steel floor/roof decking is to be wide rib profile for ease of attachment of current and future services, equipment, and fixtures using drilled insert expansion anchors into the bottom of the deck ribs.

.6 As a minimum, steel deck will be wipe coat galvanized (ZF075); steel deck for exterior exposure will be zinc coated (Z275).

.7 Conform to requirements of CAN/ULC S101 and Bulletin BXUV7 for load restricted cUL and ULC certifications for fire resistive assemblies.

Mass to fire exposed perimeter (M/D) ratios will be considered in the Design of hollow structural sections (HSS) to achieve required fire rating requirements.

.9 Fire proof structural steel floor/roof framing and supporting members to meet the fire rating requirement.

.10 Drain holes will be provided to allow release of water in all hollow steel sections subject to freezing; where drain holes are not appropriate hollow steel sections will not be used.

6.5.4 Wind-Load Bearing Steel Studs

Wind-load bearing steel studs may be considered as a component of the exterior wall systems to support exterior wall finishes and form an integral part of the perimeter envelope.

.2 Steel studs may be considered as a component of the interior partition wall systems to support interior partition wall finishes, equipment, and other secondary loads.

.3 Design, detail and construct load bearing steel studs to comply with all applicable CAN/CSA Standards.

.4 Minimum acceptable steel thickness is 0.88 mm for studs up to 152 mm, and 1.12 mm for 203 mm and larger studs; use minimum thickness of 1.12 mm for all walls having masonry veneer. Use greater thickness if required to meet the Design criteria.

The steel stud manufacturer will be certified in accordance with CSSBI Standard 30M-06 and all applicable CAN/CSA Standards. The steel stud manufacturer will be a current member of the Steel Stud Manufacturer's Associate (SSMA).

.6 The steel stud fabricator and erector will be experienced in the type of work undertaken.

.7 Conform to the Association of Wall and Ceiling Contractor's (AWCC) Specification Standards Manual.

.8 Limit maximum deflection under specified wind loads to L/360 (L/720 for masonry veneers), unless a smaller maximum deflection is specifically required due to wall finishes.

Design components to accommodate erection tolerances of the structure.

.10 Design wind bearing stud end connections to accommodate floor/roof deflections and to ensure that studs are not loaded axially.

.11 Design steel studs to take into account the anchorage of other materials being supported including but not limited to: sub-girts supporting metal cladding and composite panels, soffit finishes and the provision of lateral support at window heads.

6.5.5 Modular Ceiling Systems

Provide a special modular structural ceiling system (such as Unistrut) attached to the main structure and Designed to support all ceiling mounted equipment in applicable areas, such as Medical Imaging and Perioperative Services (including Ambulatory Procedures).

6.5.6 Corner Guards and Bumper Rails

.1 Refer to Appendix 2L Room Finish Matrix.

Provide stainless steel corner guards and bumper rails complete with concealed hardware in infection control sensitive areas, including:

Medical Device Reprocessing Department;

b) Perioperative Services (including Ambulatory Procedures);

Food Services;

Laboratory;

e) Pharmacy;

Portering Services/ Equipment Depot;

g) Environmental Services and Laundry;

Biomedical Engineering;

i) sterile storage areas; and

j) other clinical areas with high risk of impact from utility cart traffic.

Provide heavy duty steel corner guards and bumper rails complete with concealed hardware in utility service areas, including:

Materiel Management;

Environmental Services;

c) Facilities Maintenance and Operations workshops and Loading Dock;

utility corridors with heavy utility cart and pallet jack traffic; and

Service Centre.

6.5.7 Guardrails and Handrails

Provide guardrails and handrails of minimum diameter 42mm

All guardrails and handrails to be Designed to resist Design loads in accordance with their usage classification and per applicable codes and CSA Z8000 including for Bariatric use.

c) Provide a durable paint finish for steel guardrails.

Provide a manufactured pre-finish for stainless steel or aluminum guardrails.

Provide safety glass for glazed decorative railings to a minimum height of 1800mm.

In exterior applications of guardrails, where a hazard exists, provide guardrails to conform to the requirements of the BC Building Code.

g) Colour contrast handrail with surroundings to assist users who are partially sighted

to identify.

h) Terminate all handrails at a post or turn back to terminate at a wall or floor surface.

6.5.8 Ornamental and Miscellaneous Metals

Provide all non-ornamental metal fabrications and miscellaneous metals required for installation of structural steel, decking and joist framing, and other structural components.

.2 Provide ornamental metals, architecturally finished in accordance with the CISC Code of Standard Practice, level as appropriate to the expected viewing distance.

Provide protective coatings for all metals in accordance with the CISC exposure zones, and as follows:

a) Galvanized steel surfaces to be coated, will be prepared to SSPC-SP16 in accordance with CISC standard and the selected finish system.

b) Provide coatings that are compatible with the substrate and consist of :

a high solids polyamide epoxy primer;

a polyester modified, aliphatic acrylic polyurethane intermediate coat;

a polyester modified, aliphatic acrylic polyurethane finish coat; and

have a minimum gloss level of G6 in accordance with the selected finish system.

Stripe coat all edges to maintain dry film thickness.

6.6 Wood, Plastics and Composites (including Millwork) (Division 6)

6.6.1 Basic Requirements

The use of wood and plastic products is to be within the limitations of combustible content restrictions of the BC Building Code for the specific occupancy classification of the Building.

.2 Timber is to be considered as an acceptable product for the interior Construction in accordance with the Wood First Act (British Columbia) and Appendix 2B – Wood First Appropriate Matrix.

.3 Provide rough carpentry, wood backing materials, and fire rated backing boards (as required by code) for mechanical rooms and electrical/communication rooms, roof sheathing, copings, cant strips, finish carpentry and architectural woodwork, including but not limited to exterior fascia's, cabinets, casework (excluding laboratory casework, which is included in Division 12), frames, panelling, ceiling battens, trim, installation of doors and hardware, and other wood-related products and applications as required:

to support functionality as defined in Appendix 2A Clinical Specifications or as required for operation of the Building; and

as required for wood products exposed to view in finished interior and exterior installations.

.4 In diagnostic, testing, and acute care areas, materials and finishes shall be moisture impervious and compatible with disinfectants approved by the Owner. Only non-cellulose Building materials shall be used.

.5 Provide solid and seamless polymer fabricated or stainless steel surfacing for:

all counters that incorporate integral sinks;

other areas as required to create surfaces that provide antiseptic or clean characteristics, special or regular maintenance, and resistance to caustic action of chemicals or agents used by the Owner; and

in clinical areas and patient care areas all exposed undersurfaces are to be either finished or enclosed.

Provide acrylic plastic products or other products as approved as required for wall cladding, wall protection, corner protection, casework finishing, trims, ornamental elements, and other applications to achieve a quality of interior finish suitable for use by patients and staff and to be compatible with the Owner's cleaning and disinfectant products.

.7 Use pressure treated wood for any exterior exposed wood. Where product is used in a visible location use cedar or other architecturally appropriate wood that has been finished to provide a high grade visual appearance.

Use fire-retardant treated wood only for limited permitted concealed interior wood applications.

.9 Do not use formaldehyde containing materials in the Building.

6.6.2 Structural Wood

Conventional wood framing, Glulam, Cross Laminated Timber (CLT) and other engineered wood Design and Construction may be considered for structural elements and systems where appropriate, in accordance with Appendix 2B – Wood First Appropriate Matrix.

.2 Design and construct wood elements in accordance with requirements of the BC Building Code, CAN/CSA 086, and all other applicable Standards and specifications.

All wood members will be constructed by experienced carpenters and will be built level, square and plumb, to the dimensions specified in the Construction documents.

.4 Manufactured wood I-joists, roof trusses, Glulam, CLT, and other wood elements and systems Designed by the manufacturer to be inspected and tested by manufacturer on Site as part of its quality control program in accordance with all applicable Standards.

.5 For timber floor and roof Construction, the deflection of timber beams, joists, and girders due to the wet weight of concrete topping is to be considered. Topping slab thickness may have to vary to maintain floor levelness tolerances. The additional concrete ponding weight is to be considered in the Design of the structure.

.6 Concrete topping slabs will be finished with a smooth, dense, steel trowel finish in accordance with Section 6.3.3.1. Design and construct concrete topping slabs on cross-laminated timber floor panels to control cracking and avoid random surface shrinkage cracking and radial cracking around re-entrant corners. Implement concrete Construction and curing procedures to minimize cracking for concrete topping slabs on metal deck.

.7 Interior framing (i.e. contained within the Building envelope) to be Designed for dry service conditions. Exterior framing to be Designed for wet service conditions (northern service conditions) and will be preservative treated, but will not be incised to facilitate the treatment.

Wood moisture content will be considered during the Design.

Provide a contiguous moisture barrier between all wood elements and concrete.

Protect all wood elements from adverse conditions such as rain, deleterious chemicals etc. in accordance with all applicable CSA material Standards and in accordance with all applicable manufacturers' recommendations.

Glulam elements will be quality appearance and exterior service grade, unless more stringent architectural requirements are applicable. Exposed CLT panels will have a Visual Appearance Classification with internal fibre layers: SPF, NLGA Standard Grading Rules 'No.2 Structural' characteristics. Face layer: SPF 'J' Grade (Japanese Grade). Concealed CLT panels may have a Non-Visual Appearance Classification with internal fibre layers: SPF, NLGA Standard Grading Rules 'No.2 Structural' characteristics. Face layer: SPF, NLGA Standard Grading Rules 'No.2 Structural' characteristics.

6.6.3 Wall Guards and Corner Guards, Handrails, Wall Protection, Door Edge and Door Frame Protection

Wall and corner guards

Provide protection of walls and exposed wall corners at clinical care areas, service areas, and other areas as required, to prevent damage due to impact from traffic such as stretchers, equipment and service vehicles.

Select materials appropriate to the amount and degree of impact anticipated. In clinical patient care areas materials will be the smooth and sealed, with no cracks and crevices

.2 Handrails

Provide handrails in all corridors and patient care areas of an appropriate type for patient support, including Bariatric patients. Provide appropriate structural support for handrails for Bariatric patient use.

Select materials and shapes appropriate for the use, provide continuous uninterrupted supports.

c) Provide handrails with continuous smooth coverage of all parts of the assembly. No ledges, ridges, or uncovered back assemblies permitted.

d) Return all handrails back to the wall in corridors at completion of run.

.3 Wall protection

Apply sheet wall protection to wall areas where the impact damage anticipated is of a larger area of wall than would be protected by bumper guards.

Provide wall splash back protection behind and surrounding hand sinks, scrub sinks and housekeeping sinks. Wall splash back protection to be installed from top of wall base to minimum 600 mm above the sink rim.

c) Provide full height wall protection in public and patient washrooms behind sinks extending 3000mm each side of sink and in in hand hygiene sink alcoves.

Provide full height wall protection in areas where chairs may impact walls.

Provide heavy duty steel wall protection in stores area, and heavy duty steel bumper guards around forklift machine docking area within Materiel Management.

Apply sheet wall protection to faces of doors where impact damage is anticipated. Use sheet wall protection that complements the installation of door edge and frame protection.

g) Secure wall and corner guards to reinforcing and backing in the walls, such backing sufficient to withstand expected impact loads. Wall protection will be high

impact and stain-resistant.

h) Use wall protection handrails and corner guard products that are stain- resistant to pen marks, paint, and graffiti, and able to withstand commercial cleaners and the Owner's cleaning products without fading or staining. Use evidence based products containing anti-microbial additives to retard mildew and bacterial growth.

.4 Door Edge and Door Frame Protection

Protect door edges and door frames in patient care and clinical areas from damage such as impact caused by the regular movement of stretchers, carts and other wheeled vehicles.

b) Protect door edges and door frames in service areas from damage such as impact caused by regular and non-regular service carts, trollies and vehicles.

c) Use bumper guards, crash rails, handrails, and corner guards that are high impact-resistant extrusion conforming to ASTM D4226 and with anti-microbial additive.

6.6.4 Finish Carpentry, Millwork and Architectural Woodwork

Conform to Architectural Woodwork Manufacturer's Association of Canada (AWMAC) 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.

For millwork and cabinets, seal all wood surfaces and edges with plastic laminate for infection control (including grommet holes and millwork access panels).

.3 Adhesives will be non-toxic, non-solvent glue to comply with AWMAC Quality Standards Manual, Canadian 'Eco-Logo' program, and CaGBC (Canada Green Building Council).

.4 Use marine-grade plywood substrate for countertops. Ensure plywood substrate is enclosed. Do not use fibreboard or particleboard.

Provide sloped tops for all millwork cabinets that do not go to underside of ceiling.

6.7 Thermal and Moisture Protection (Division 7)

6.7.1 Basic Requirements

Design envelope assemblies according to sound Building science principles and best Construction practices.

Design envelope assemblies:

to prevent the water ingress into susceptible components of the building envelope and into the interior of the Building;

to limit the air intrusion and leakage (air infiltration and exfiltration), bulk vapour movement, and vapour diffusion from interior to exterior; and

c) to limit the condensation potential on susceptible components.

.3 Design below grade envelope assemblies to prevent the ingress of moisture through foundation walls, slab on grade and suspended slab both subject and not subject to hydrostatic pressure.

Provide continuous thermal barrier protection (such as insulation) to resist the transfer of heat through exterior walls and roofs to create comfortable, livable interior environments.

Provide resistance to the propagation and spread of fire for exterior walls and interior walls Designated as fire-resistance rated separations where appropriate.

Design envelope and structural Construction assemblies to limit thermal bridging to less than 1% from interior to exterior.

Overall Building window/wall ratio to be a minimum of a 40:60 ratio with consideration to providing maximum occupant views and minimizing energy efficient impacts.

.8 As part of meeting minimum Provincial Step Code targets, the Participants will follow the requirements of Section 2.4 Infiltration of the City of Vancouver Energy Modelling Guidelines Version 2 to be confirmed by mandatory air tightness testing.

6.7.2 Performance Criteria

Dampproofing

Do not use dampproofing for prevention of moisture ingress in below grade assemblies.

Waterproofing

Provide waterproofing to prevent moisture ingress to basement and crawl spaces below grade.

Use membrane waterproofing to prevent water ingress over suspended slabs and decks and associated walls over habitable spaces where water collection is anticipated.

Use fluid-applied waterproofing for mechanical room floors.

Provide water resistant barrier in exterior walls as part of the Building envelope and integral with rain screen or cavity wall assemblies.

e) Dam the floor under key mechanical equipment in the mechanical penthouse, mechanical rooms and mechanical shafts with a continuous curb and waterproofing to contain the water. Provide floor drains.

Dam the floor under all MDRD equipment or any other equipment above clinical care areas using water including mechanical areas, with a continuous curb and waterproofing to contain the water. Provide floor drains.

g) Provide two stage expansion joints, if required, in the below grade assemblies. Provide protection and eliminate hydrostatic pressure against the expansion joints.

Vapour Retarders

Prevent water vapour transmission and condensation in wall assemblies, roofing assemblies, and under concrete slabs-on- grade within the Building perimeter by means of a continuous vapour barrier membrane.

Provide materials in accordance with ASTM E2178.

c) Provide materials that are torch applied, or self-adhering.

.4 Air Barriers

Prevent air leakage caused by air pressure across the walls, fenestration and roof assemblies by means of a continuous air barrier system across the Building envelope.

Provide materials in accordance with CSA S741 and CSA S742.

Provide prefabricated membrane-type materials.

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;

limit air leakage caused by air pressure across the wall and roof assembly, including interruptions to the integrity of wall and roof systems such as junctions with dissimilar Constructions; and

limit air leakage through penetrations.

.5 Thermal Protection

a) Provide rigid and semi-rigid 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 resist the absorption of water.

Use thermal protection materials of a type and quality that will provide consistent environmental quality to enclosed spaces.

c) Use foamed plastic insulation that is CFC and HCFC free.

Minimum insulation values to be informed through energy modelling and future climate change Design criteria. Minimum roof and exterior wall values to be according to ASHRAE recommended standards.

e) Use of expanded polystyrene (EPS) insulation including within the slope package in the roof assemblies is prohibited.

Roofing

Provide multi-ply modified bituminous SBS roofing assemblies, compliant with CSA A123.21, and as follows:

i) Comply with the Roofing Contractors Association of British Columbia Guarantee Roof Star latest Standards and requirements for a ten (10) year Guarantee, as published in the Roof Star Roofing Practices Manual. Perform roofing quality inspections as required by the RCABC to obtain the RCABC warranty. All roofing inspection reports to be provided to the Owner as part of Hand Over.

Provide roofing assemblies that will withstand changes in air pressures due to helicopter approaches and landings. Do not use glare producing roofing materials within the 50m diameter of the Heliport.

Comply with Roof Star Roofing Practices Manual "Acceptable Materials List".

Flexible membrane for reflective roofs – Energy Star compliant (highly reflective) and high emissivity (of at least 0.9 when tested in accordance with ASTM 408).

Design to a roof R value of minimum R-40. If sloped insulation is used R-30 minimum is required at roof drains.

Use foamed plastic insulation that is CFC- and HCFC-free and complies with the province of British Columbia Ozone Depletion Substances Regulations.

c) Provide a complete horizontal barrier to weather and changing climate using one of the aforementioned roofing systems.

d) Roofing systems will include:

flashings and sheet metal;

thermal insulation;

roofing specialties and accessories required for completion;

interior access systems to roof areas;

protection from pedestrian traffic and solar radiation;

roof drainage, including overflow scuppers; and

Fall restraints and roof anchors.

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 flexible membrane sub flashing continuously under the metal.

Metal roofing systems, if used, will be complete with continuous waterproof membrane as part of the assembly and provide clear internal paths of drainage to allow any trapped moisture to drain to the exterior and avoid the staining of architectural finishes, forming of puddles, forming of icicles, and dripping on pedestrians.

In Designing the Facility, including any roof systems, ensure that entrance ways are protected from sliding snow and ice and that there are no accumulations of snow and ice in roof valleys.

h) Allow for Photovoltaic arrays to be mounted on the roofs without fastening or disruption of roof assembly and roofing membrane.

Fire and Smoke Protection

Use spray-applied cementitious fireproofing if required to achieve a fire resistance rating.

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.

Apply protection around penetrations through vertical and horizontal fire-resistance rated separations.

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.

Use firestopping that:

is compatible with substrates;

allows for movement caused by thermal cycles; and

prevents the transmission of vibrations from pipe, conduit or duct to structure and structure to pipe, conduit or duct.

When more than one product is required for an assembly, use products that are compatible with one another and from the same manufacturer.

g) Use fire stopping sealants and coatings that are silicone-based and guaranteed not to re-emulsify if subject to wetting or standing water. Do not use acrylic-based coatings and sealants.

Sealants

All sealants and sealant primers used on the interior of the Facility will comply with the requirements of LEED - low VOC.

Provide engineered sealant joints.

Apply sealant materials to achieve:

Seals to the joints, penetrations and interface details of the Building envelope systems as required to prevent water ingress;

seals around and over cavities in or behind surface elements to allow effective infection prevention and control (note that sealant around door frames must include joints at bottom of door frames between floor finish and frames);

sealed joints between dissimilar or similar materials to allow a smooth or even transitions; and

sealed expansion or controls joints in the Building envelope systems or structural systems to allow movement.

Do not use unsealed joints in clinical areas.

For the exterior; use sealants to completely and continuously fill joints between dissimilar and/or similar materials.

For the interior; use sealants (at frames such as those at doors, windows and skylights), to completely fill joints between dissimilar materials using one component, acrylic emulsion, paintable type.

g) Use silicone caulking that is mildew-resistant and impervious to water for caulking washroom plumbing fixtures.

Use sealants with self-levelling properties for expansion and control joints in concrete floors using two-component epoxy urethane sealants.

i) Use non-sag sealants for exterior vertical expansion and control joints in masonry or wall cladding.

j) Use sealants that allow for minimum 25% movement in joint width.

k) In corridors and other traffic areas used by laundry carts, supply carts, material handling equipment use traffic bearing type sealants suitable to support imposed load without deformation or failure.

For any joints larger than 3.175 mm (1/8”) use non-gassing backer rod below sealant joints.

m) Avoid three sided adhesion at all circumstances.

Use exterior sealant joints with long term performance, minimum 20 years.

o) Provide 20 year warranty for exterior sealant joints. Provide 5 year warranty for interior sealant joints.

p) Provide sealant joints with no incompatibility with and in contact with membrane and other Building envelope components.

6.7.3 Green Roof Assemblies

Provide intensive and simple intensive green roof assemblies which incorporate vegetation appropriate for the local conditions in locations determined through consultation.

.2 Comply with the requirements of the Roofing Contractors Association of British Columbia Guarantee Roof Star latest standards and requirements for a (10) year Guarantee, as published in the Roof Star Roofing Practices Manual.

6.8 Cladding (Division 7)

6.8.1 Acceptable cladding materials include:

Section 6.4 Masonry – Concrete Unit, Brick & Stone Masonry

.2 Section 6.9 Openings- Glass & Glazing

.3 Section 6.8.2 Phenolic Panels

.4 Section 6.8.3 Metal Cladding

Section 6.8.4 Composite Aluminum Cladding

.6 Section 6.8.5 Aluminum Curtain Wall

Section 6.8.6 Cementitious Cladding

6.8.2 General

All cladding should conform to the following performance criteria:

High durability during its life warranty;

b) dent and fracture resistant;

c) colour fastness;

fire resistant; and

minimal maintenance requirements.

6.8.3 Phenolic Panels

Panels to be high density phenolic resin with acrylic resin finish.

.2 Acceptable Phenolic Panels include Trespa, Prodema, Fundermax or similar.

Phenolic Panels to comply with all applicable CSA Standards per BC Building Code.

6.8.4 Preformed Steel Metal Cladding

Insulated metal panels and metal cladding to be avoided on Building facades except where not visible from grade such as mechanical penthouse exterior.

Pre finished metal cladding can be used on the FMO Vehicle Garage .

Metal Panel to be prefinished baked enamel finish.

Maximum panel deviation (flatness) to be 3 mm in 1530 mm in any direction for assembled units (non-accumulative – no oil canning).

.5 Provide systems Designed for movement of components without causing buckling, failure of joint seals, undue stress on fasteners when subject to seasonal temperature range from -20°C to +50°C;

.6 Provide systems which include expansion joints to accommodate movement in wall system and between wall system and Building structure, where these movements are caused by deflection of the structure;

.7 Provide system which accommodate movements, without permanent distortion, damage to infills, or cracking of joints;

.8 Provide systems which are Designed for positive drainage to exterior of all water entering; and

.9 Provide systems which use only fasteners which are:

concealed;

corrosion resistant;

non-staining; and

d) compatible with adjacent materials.

.10 Provide sub girts system with thermal clips, and is triple hot dipped galvanized steel up toZ270or G90.

Provide 300 series stainless steel, triple galvanized or epoxy coated fasteners that are corrosion resistant to 2000 salt spray hours.

6.8.5 Composite Aluminum Cladding

Composite Aluminum cladding can be integrated into aluminum curtain wall system or be stand- alone system.

.2 Aluminum to be prefinished aluminum or baked enamel finish

Maximum panel deviation (flatness) to be 3 mm in 1530 mm in any direction for assembled units (non-accumulative – no oil canning).

.4 Provide systems Designed for movement of components without causing buckling, failure of joint seals, undue stress on fasteners when subject to seasonal temperature range from -20°C to +50°C;

Provide systems which include expansion joints to accommodate movement in wall system and between wall system and Building structure, where these movements are caused by deflection of the structure;

.6 Provide system which accommodate movements, without permanent distortion, damage to infills, or cracking of joints;

Provide systems which are Designed for positive drainage to exterior of all water entering or condensation occurring within composite wall panel system; and

Provide systems which use only fasteners which are:

concealed;

corrosion resistant;

non-staining; and

compatible with adjacent materials.

.9 Provide sub girts system with thermal clips, and is triple hot dipped galvanized steel up toZ270or G90.

Provide 300 series stainless steel, triple galvanized or epoxy coated fasteners that are corrosion resistant to 2000 salt spray hours.

6.8.6 Aluminum Curtain Walls

Aluminum curtain walls will comply all applicable Standards, including the Aluminum Association Standards (AAS) and the American Architectural Manufacturers Association (AAMA) field testing specifications.

.2 Incorporate in the curtain wall framing a drained and vented system complete with air and vapour seal, allowing any water entering the framing/system and the glazing detail cavities to drain to the exterior and also allow air into the pressuring chamber.

All exterior windows to be sealed double glazed units.

.4 Provide curtain wall framing that incorporates a thermal-break.

.5 For exposed aluminum surfaces, provide a finish that is permanent and resistant to corrosion resulting from weather exposure and climate.

.6 Provide assemblies that resist local seismic conditions and 1-in- 100 year climatic events (with a safety factor).

.7 Window wall framing relying on primary face seals is not allowed.

.8 Provide systems tested for water penetration at a minimum cyclic static air pressure difference of 0.67 times the reference static-air-pressure difference per CSA A440 Canadian Supplement, and in accordance with ASTM E1105 Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls.

Provide systems which resist air infiltration of no more than 0.03 L/s/m² at a minimum static air pressure difference of 75 Pa in accordance with ASTM E783 Determining Air Leakage Rates of Installed Exterior Windows and Doors.

.10 Provide systems which have an average insulation factor of a maximum of 2.2 W/m²•K in accordance with American Architectural Manufacturers Association 1503 Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.

.11 Provide systems which prevent excess internal passive solar gain to a maximum allowable interior mean radiant temperature of +35°C on the interior lite of insulated glazing units.

.12 Provide systems which accommodate thermal movements for the following maximum change in ambient and surface temperatures:

Winter minimum: ambient -20°C, surface -15°C;

Summer maximum: ambient +40°C, surface +55°C; and

Temperature range: ambient 60°C, surface 70°C difference.

.13 Provide systems which are supported by an aluminum framing structure; and only use fasteners which are:

concealed;

corrosion resistant;

non-staining; and

compatible with adjacent materials.

.14 Provide glazing with high performance low-e coatings that maximize visible light transmittance and provide thermal properties appropriate for the energy performance of interior spaces;

.15 Provide glazing which has visibility fritting on glass on all vertical elements in passenger and pedestrian flow areas to alert persons to the presence of transparent surfaces;

.16 Provide systems which are supported on a reinforced concrete curb of a minimum of 150 mm and maximum of 300 mm high when extending to grade; and

.17 Provide laminated safety glass using heat strengthened glass incorporating Ionoplast structural laminating film or similar products that provide similar stiffness and glass retention.

6.8.7 Cementitious Cladding

Glass Fibre Reinforced Cement Composite Wall Panels: Concrete panels, to ASTM C1186, reinforced with continuous linear strands and short strands of alkali resistant glass fibres in a cementitious matrix, install in a concealed fastener configuration.

.2 Provide systems with consistent colour and texture across and within batches.

Provide systems Design for movement of components without causing buckling, failure of joint seals, undue stress on fasteners when subject to seasonal temperature range from -24°C to +50°C.

.4 Provide systems which include expansion joints to accommodate movement in wall system and between wall system and Building structure, where these movements are caused by deflection of the structure;

.5 Provide system which accommodate movements, without permanent distortion, damage to infills, or cracking of joints.

.6 Provide systems which are Designed for positive drainage to exterior of all water entering or condensation occurring within composite wall panel system.

.7 Provide sub girts system with thermal clips, and is triple hot dipped galvanized steel up toZ270or G90.

Provide 300 series stainless steel, triple galvanized or epoxy coated fasteners that are corrosion resistant to 2000 salt spray hours, and compatible with adjacent materials.

6.9 Openings (Division 8)

6.9.1 Glass Glazing

Glass glazing will be in accordance with CSA A500.

.2 For glass glazing applications within 3 m of a finished floor provide glass with a minimum modulus of rupture of 165 MPa, labelled, incorporating a 1.50 mm minimum ionoplast structural laminating film, and as follows:

heat treated, laminated structural glass manufactured in accordance with CAN/CGSB 12.1 Safety Glazing and ASTM C1172 Standard Specification for Laminated Architectural Flat Glass;

Type 1 – Transparent Flat Glass, Class 1 – Clear, or Quality Q3 – Architectural Glass in accordance with ASTM C1036 Standard Specification for Flat Glass; or

Type II - Laminated Safety Glass in accordance with ASTM C1172 Standard Specification for Laminated Architectural Flat Glass.

For glass glazing applications not in public view, or above 3000mm of a finished floor provide labelled glass, and as follows:

Clear, transparent, annealed float glass in accordance with CAN/CGSB 12.3 Flat, Clear Float Glass, labelled, and with specific defect limitations as defined by Table 3 of CAN/CGSB 12.3 *Flat, Clear Float Glass* based on area of glass units; or

Clear, transparent, low-emissivity glass in accordance with CAN/CGSB 12.10 Glass, Light and Heat Reflecting, labelled, annealed, heat strengthened or tempered as required by glass manufacturer to prevent glass breakage arising from thermal shock, and with have specific defect limitations as defined by Table 3 of CAN/CGSB 12.3 Flat, Clear Float Glass based on area of glass units;

.4 Except where wire glass is required in accordance with the BC Building Code, construct interior windows, sidelights and glazing forming part of doors of tempered glass. For exterior glazing at doors and sidelights, use laminated glass.

.5 Installation methods and locations for doors, frames and hardware to conform with the Standards of the Door and Hardware Institute (DHI).

Glass and glazing in Psychiatry areas must have a minimum of 454 kg (1000lb) resistance and in Secure areas a minimum of 907 kg (2000lb) resistance. Refer to Appendix 2A Clinical Specifications.

6.9.2 Interior Doors

Interior doors are to be sized, fabricated and installed to suit the intended function of spaces or rooms requiring acoustic or visual privacy, security, special HVAC requirements, fire-resistance rated separations or other closures.

.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.

No single door will have a width of less than 750mm, unless it is a small door leaf in an opening pair of doors in which case small door leaf size should be no less than 300mm.

.4 Provide double doors into rooms where large pieces of equipment will be moved in or out during the lifetime of the Facility and where such equipment cannot pass through a single 1200 mm wide opening.

.5 ICU/HAU inpatient room doors and Airborne Isolation room doors will be 3 panels wide sliding glass.

Emergency Department Trauma/Resuscitation Bay and Treatment Rooms will be 2 panels wide sliding glass.

.7 Size door openings to accommodate movement of equipment.

Size door openings to suit Bariatric patient requirements for all patient rooms of General Medical/Surgical Inpatient units, ICU/HAU and other rooms identified in Appendix 2A Clinical Specifications for Bariatric use. The minimum door opening size will be 1500 mm.

.9 Provide door widths that are 1500 mm clear for both Bariatric and non-Bariatric patient rooms. Doors must have a large door leaf and a small door leaf. Provide a viewing window in the large door leaf, with an integral blind in the window unit, operable from both sides

Provide double doors into corridors and major rooms to ease access where patients in beds or stretchers will be attended to or accompanied by a large number of medical staff and medical equipment.

Unless required otherwise, provide doors to patient care areas, including doors to water closets and change room cubicles with a minimum width of 900 mm.

.12 Provide a minimum of 2150 mm high door or door leaf, unless specifically required for access to services or other purposes where height is restricted.

.13 Acoustic Requirements for Doors: refer to CSA Z 8000 Section 12.2.7.2 for STC ratings of doors and provide ratings as recommended by acoustic consultant.

.14 Provide patient rooms with hardware that allows the doors to stay in an open position and facilitates casual observance of patients by the nursing staff.

.15 For doors into or between major departments or activity areas through which cart, stretcher, or bed traffic is anticipated on a routine basis, provide automatic activation by an electronic device or manual push button, located to allow emergency access without the necessity to stop movement.

.16 All other doors through which cart, stretcher, bed, or frequent patient or staff traffic is anticipated on a routine basis, provide appropriate hardware or automatic activation that allows the doors to stay in an open position.

.17 Provide, install and coordinate the type and location of door opening hardware and controls including electrical services and IMIT services.

.18 Apply door sizes and Designs consistently to rooms of similar use, location, and configuration.

.19 Avoid doors swinging into corridors in a manner that may obstruct traffic flow or reduce the corridor width, except doors to Psychiatry Seclusion Rooms or to spaces that are used infrequently and are not subject to occupancy such as small closets.

.20 Doors may swing into patient bathrooms, provided they allow for ease of patient use, both on their own and assisted by staff. Equip such doors with appropriate hardware to allow the door to be opened out into the room in an emergency situation.

.21 Single fixture Washrooms for public/patient/staff use to have double-hinged swing doors to allow for emergency access.

.22 Provide all doors with appropriate hinges, edge protection, and face protection to minimize damage and resultant disruptive maintenance.

.23 Finish doors and frames with a suitable finish that prevents dirt and fingerprint accumulation and can be easily cleaned and disinfected with the Owner's approved cleaning products.

.24 Standardize the extent of glazing in a door, or the size and quantity of sidelights, and balance these between the nature of observation required and the privacy requirements of the occupants of the room. Where possible and appropriate, provide glazing in an adjacent sidelight rather than within the door itself.

.25 Provide glazing in doors and sidelights in such a way that they allow patient observation and operational safety of the spaces they serve.

.26 Provide tempered glass in aluminum frame sliding doors. Sliding doors to be without floor tracks (except pressurized rooms such as Airborne Isolation Rooms) and be provided with emergency swing breakout.

.27 Provide interior blinds or electrostatic control suitable and appropriate for the level of privacy intended and required.

.28 Provide doors and door frames with the capability to withstand the varying and high levels of humidity and impact that occur typically within a hospital and in specific rooms within a hospital and maintain their inherent aesthetic and functional capacities.

.29 Frames and anchors for doors, sidelights, interior and exterior windows in Psychiatry components, and other areas as determined through consultation, will be Designed to withstand a heavy degree of impact while maintaining their aesthetic and functional capacities. Glazing will be impact resistant and use hospital-type cutaway jambs. Impact resistance will be to meet the requirements of AAMA 501.8 Standard Test for Determination of Resistance to Human Impact of Window Systems Intended for Use in Psychiatric Applications.

.30 In areas where security is considered paramount, including Psychiatry units and secure entrances, achieve safety and security with the appropriate location, configuration, materials, Construction and detailing of doors and hardware as required by British Columbia Ministry of Health Standards for Hospital-Based Psychiatric Emergency Services: Observation Units and the Provincial Quality, Health and Safety Standards and Guidelines for Secure Rooms in Designated Mental Health Facilities under the B.C. Mental Health Act.

.31 In the Secure Rooms provide door width in accordance with the Provincial Quality, Health and Safety Standards and Guidelines for Secure Rooms in Designated Mental Health Facilities under the B.C. Mental Health Act.

.32 Provide colour contrast glazing film on doors that are glazed to allow users to identify glass surface and prevent accidents.

6.9.3 Exterior Doors

Exterior doors are to be sized, fabricated and installed to suit the intended function of spaces or rooms requiring acoustic or visual privacy, security, special HVAC requirements, fire-resistance rated separations or other closures.

.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.

.3 Provide double doors where large pieces of equipment will be moved in or out during the lifetime of the Facility and where such equipment cannot pass through a single 1200 mm wide opening.

.4 Acoustic Requirements for Doors: refer to CSA Z 8000 Section 12.2.7.2 for STC ratings of doors and provide ratings as recommended by acoustic consultant.

.5 Provide, install and coordinate the type and location of door opening hardware and controls including electrical services and IMIT services.

.6 All other doors through which materials, cart, stretcher, bed, or frequent patient or staff traffic is anticipated on a routine basis, provide appropriate hardware or automatic activation that allows the doors to stay in an open position.

.7 Provide all doors with appropriate hinges, edge protection, and face protection to minimize damage and resultant disruptive maintenance.

.8 Provide specialty doors such as overhead rolling service doors as required for function of the spaces.

.9 Provide weather sealing on all exterior doors.

Provide overhead canopy protection to all exterior doors to prevent water ingress.

6.9.4 Exterior Windows

Provide assemblies able to withstand positive and negative pressures normal to the plan of window based on a 1 in 50-year wind event and be tested accordingly in

accordance with CSA A440S1, the Canadian Supplement to NAFS standard and CAN/CSA A440/A440.1 Window/User Selection Guide to CSA Standard A440 Windows and that are sized and configured to maximize natural light, views, and natural ventilation.

.2 Size, configure, and adequately construct windows to suit rooms that require daylight, views and/or natural ventilation.

Main entries to have full height glazing for visibility into the interior lobby.

Overall Building window/wall ratio to be a 40:60 ratio.

Window framing systems to be thermally-broken, Designed based on principles of pressure equalized rain screen.

.6 Provide exterior windows in all inpatient rooms other than as exempted below. Provide operable windows (windows that may be opened and closed) minimum size 600mm x 100mm.

Do not provide operable windows in Airborne Isolation Rooms and Psychiatric Inpatient, PICU and PES rooms.

.8 Provide exterior windows with trickle vents in the Psychiatry areas that meet the requirements of the British Columbia Ministry of Health Hospital-Based Psychiatric Emergency Services Standards and the Provincial Quality, Health and Safety Standards and Guidelines for Secure Rooms in Designated Mental Health Facilities under the B.C. Mental Health Act.

.9 The exterior window in Secure Rooms will have a minimum total area of 1.5 square metres. The exterior window will be made up of several smaller windows that could be stacked vertically or placed side by side horizontally and will be separated among them by sections of wall not mullions. The smaller windows will have a maximum clear (glass) width of 100mm and a minimum clear (glass) length of 1000mm with no mullions in between. The sum of the areas of the smaller windows will be the minimum total area required.

In Secure Rooms on the side exposed to the patient glass in windows will comply with a 2000lb impact test as specified by the New York State Office of Mental Health, Patient Safety Standards– Materials and Systems Guidelines and AAMA 501.8 Standard Test Method for Determination of Resistance to Human Impact of Window Systems Intended for Use in Psychiatric Applications.

Provide field water penetration testing on a minimum of 5% of the fenestration assemblies and include one assembly of each type.

.12 Provide glazing with an overall U value of minimum 1.8 W/m2/K.

.13 Provide double glazing on windows.

6.9.5 Interior Windows

Provide 'borrowed light' through interior windows to occupied rooms that do not have exterior windows. The intent is to borrow light from areas that have windows and consequently create a more comfortable and less closed-in atmosphere. Provide partition glazing in:

Offices; and

Meeting Rooms.

.2 Provide 1000 mm x 900 mm minimum wide interior windows in the following rooms:

Intensive Care Unit/High Acuity Unit: provide a minimum 1500mm wide by

900mm high window in between adjacent ICU rooms, and provide two minimum 600mm wide by 900mm high windows from the charting counters at corridor outside ICU patient bedrooms;

provide viewing/pass through window between the Ante Room into the Airborne Isolation Rooms; and

in the Emergency Department from the Ante Room into the Decontamination Room.

Provide an interior window from the corridor into the Inpatient room in the Psychiatry areas that meet the requirements of the British Columbia Ministry of Health Hospital-Based Psychiatric Emergency Services Standards.

.3 Coordinate glazing heights with adjacent wall protection, handrails, and other accessories to achieve functional and aesthetic cohesiveness.

.4 In Secure Rooms on the side exposed to the patient glass in windows will comply with a 2000lb impact test as specified by the New York State Office of Mental Health, Patient Safety Standards– Materials and Systems Guidelines and AAMA 501.8 Standard Test Method for Determination of Resistance to Human Impact of Window Systems Intended for Use in Psychiatric Applications.

.5 Provide interior windows between scrub sinks and Operating Room and Procedure Rooms. Windows to be polychromatic glass (controlled both sides) from the scrub sink into each Operating Room and Procedure Room with visibility to the patient table. Infection prevention and control requirements include a smooth, seamless, cleanable product, able to withstand frequent cleaning and disinfection with hospital grade cleaners and disinfectants.

6.9.6 Hollow Metal Doors and Frames

Provide materials and manufacture of metal doors that will comply with the requirements of the Canadian Steel Door and Frame Manufacturer's Association (CSDFMA).

.2 Provide interior metal doors with flush face Construction.

Provide exterior metal doors with:

flush face Construction;

edge seams to correspond with door function and minimize maintenance needed; and

prepared surfaces to receive finishes that resist corrosion from exposure to weather.

.4 Provide pressed metal frames with:

fully welded Construction;

thermally-broken door frames for exterior door; and

anchors to each jamb to suit wall type and receive the frame.

6.9.7 Door Glazing

Provide laminated safety glass using tempered glass incorporating ionoplast structural laminating film; and consisting of at least 0.54 m^2 of the door's area.

For exterior hollow metal door glazing, use sealed units with warm edge, in thermally-broken frames to prevent heat loss.

For interior hollow metal door glazing use monolithic glass.

.4 Provide exterior doors meeting the requirements of Table 1: Classification of Exterior Hollow Steel Frames and Doors below, based upon expected daily usage:

Table 1: Classification of Exterior Hollow Steel Frames and Doors

Description	Daily Cycles	Construction Door Seams	Construction Frame Seams	Minimum Door Sheet Gauge	Minimum Frame Sheet Gauge
Heavy duty	Less than 200	Spot-welded seam, mechanically interlocked or adhesive assisted Construction	Full face-welded frames	18	16
Extra heavy duty	Greater than 200 (inclusive) and less than 400 (inclusive)	Continuous welded seam, mechanically interlocked or adhesive assisted Construction	Full face and depth-welded	16	16
Maximum duty	Greater than 400	Continuous welded seam	Full face and depth-welded	14	14

.5 Provide additional 4.20 mm x 32 mm x 225 mm long reinforcement spanning between hinge plate and face of door or frame, at top hinge location for heavy weight doors.

.6 Provide stainless steel door protection to a height of 900 mm on extra heavy duty and maximum duty doors.

6.9.8 Wood Doors

All wood doors will comply with all applicable Standards, including the Quality Standards for Architectural Woodwork published by the Architectural Woodwork Manufacturer's Association of Canada (AWMAC).

.2 Wood doors will have hardware and finishes that suit the intended function and aesthetics of the Facility.

.3 Construct, finish, and install wood doors to minimize the requirement for maintenance and resulting disruption to Facility operations.

.4 Provide wood doors in flush Design, Architectural Grade quality (as defined in the AWMAC Standards referred to above), and solid particleboard core.

.5 Provide fire-resistance rated doors with a homogeneous incombustible mineral core and AWMAC Quality Standards Option 5 blocking.

.6 Install finish hardware securely to resist loosening over time. Fasten to solid wood backing, except where hardware is Designed to be through- bolted.

.7 Glue stiles, rails and faces to the core with Type II water-resistant adhesive to minimize de-lamination or disassembly as a result of moisture ingress.

Use B-Grade hardwood veneer with AWMAC No. 3 edge, finish to suit the intended use.

.9 Do not use wood veneer-faced doors in critical care areas for reasons of cleanliness and infection prevention and control, unless suitably finished to mitigate such concerns.

.10 In locations requiring radiation protection, line doors with lead and label such doors with lead thickness.

6.9.9 Aluminum Entrances and Storefronts

Aluminum entrances and storefront framing and doors may form part of the exterior envelope of the Building.

Provide glazed interior partitions as appropriate to comply with the functions of the spaces as defined by Appendix 2A Clinical Specification.

Use aluminum doors within aluminum entrances and storefront.

.4 Use frames that are thermally-broken, flush glazed, aluminum sections, to accept insulating glass units.

Incorporate in the frames drained and vented system (rain screen) with a complete air and vapour seal, allowing any moisture entering the frame to drain to the exterior and allowing air into the pressuring chamber.

.6 Use aluminum swing entrance doors that are heavy-duty commercial or institutional grade that may be automatically operated, motion-detector controlled.

.7 Apply aluminum finish for exposed aluminum surfaces. Finish to be permanent and resistant to corrosion caused by weather exposure and climate.

6.9.10 Specialty Doors

Overhead Rolling Service Doors

Restrain lateral movement of door curtain slats. Provide windlocks as required by door size or wind load requirements.

Provide interlocking flat slats, complete with bottom bar and contact type bottom astragal.

c) For manually operated doors, provide inside lift handle and locking bar or chain hoist. Motor operation may be provided on doors requiring constant usage. Chain operation will be by means of reduction gears and galvanized hand chain.

For fire doors, provide automatic closing device operated by fire door release device connected to Fire Alarm System.

.2 Overhead Rolling Grilles

Provide grilles that allow visual access to secure areas.

Provide aluminum or steel guides that are: fabricated to

c) withstand vertical and lateral loads; counterbalanced by helical torsion springs; and sound-deadened.

For manually operated closures, provide inside lift handle and locking bar or chain hoist. Motor operation may be provided on grilles requiring constant usage. Chain operation will be by means of reduction gears and heavy chrome plated hand chain.

Overhead Rolling Counter Shutters / Horizontal Siding Gilles

Provide shutters and grilles fabricated with extruded aluminum, galvanized steel, or stainless steel interlocking flat slats, complete with guides of similar materials.

g) Provide closures that are manually operated and with locking capability.

Interior Aluminum Sliding Doors and Sidelights

Provide interior glass sliding doors and sidelights without floor track (review pressure requirements for Airborne Isolation Rooms with Owner), sliding and fixed

panel(s) single glazed with 6 mm clear fully tempered float glass.

Interior sliding doors to have break-out capability to facilitate staff access to patient rooms.

Provide visual cues/glazing film in transparent glass panels as appropriate to prevent collisions.

Provide manual break-out capable 3 panel style interior glass sliding doors in the following patient rooms:

i. ICU/HAU;

ii. Airborne Isolation Rooms;

iii. Post-anesthesia recovery enclosed patient bays; and enclosed exam rooms in the Emergency Department.

Provide break-out capable interior glass sliding doors and sidelights, sliding and fixed panel(s), single glazed with 6 mm clear fully tempered float glass capable to maintain pressure requirements of AIR isolation patient rooms.

Provide automatic break-out capable interior glass sliding doors, with card access and locking capability, in Emergency Department.

Provide automatic break-out capable interior glass sliding doors with frosted glazing in all Medication Rooms.

.4 Automatic Sliding Doors

Automatic sliding doors complete with break-away capability for exiting may be installed at main entrance, provided that the size and configuration of the entrance vestibule is Designed such that both sets of doors will not be open at the same time.

Door equipment will accommodate medium to heavy pedestrian traffic and up to the following weights for active leaf doors: 100 kg for bi-part doors and 200 kg for single slide doors.

c) Provide door operators, including the motion and presence detection system, that are: capable of operating within the temperature ranges existing at the Building; and unaffected by ambient light or ultrasonic interference.

Provide energy-saving devices to reduce conditioned air loss.

.5 Automatic Swing Doors

a) Use automatic swing doors for interior and exterior locations where appropriate, including the entrance vestibule, cross- corridor double-egress doors, entrances to departments and areas where stretchers and equipment are frequently wheeled, and doors to exterior spaces that are required to be handicapped accessible.

If used, provide directional motion sensor control device that are unaffected by ambient light or ultrasonic frequencies.

c) Equip all in-swing doors that are required exits with an emergency breakaway switch that internally cuts power to the operator. No external power switch allowed.

Implement longer hold-open times to accommodate the elderly and frail.

.6 Pharmacy Vault Door

Provide Pharmacy vault door in accordance with Health Canada Directive On

Physical Security Requirements For Controlled Substances, edition 1999.

6.9.11 Aluminum Curtain Walls

Aluminum curtain walls will comply all applicable Standards, including the Aluminum Association Standards (AAS) and the American Architectural Manufacturers Association (AAMA) field testing specifications.

Incorporate in the curtain wall framing a drained and vented system complete with air and vapour seal, allowing any water entering the framing/system and the glazing detail cavities to drain to the exterior and also allow air into the pressuring chamber.

All exterior windows to be sealed double glazed units.

.4 Provide curtain wall framing that incorporates a thermal- break.

For exposed aluminum surfaces, provide a finish that is permanent and resistant to corrosion resulting from weather exposure and climate.

.6 Provide assemblies that resist local seismic conditions and 1-in- 100 year climatic events (with a safety factor).

.7 Window wall framing relying on primary face seals is not allowed.

Provide systems tested for water penetration at a minimum cyclic static air pressure difference of 0.67 times the reference static-air-pressure difference, but not less than 200 Pa in accordance with ASTM E1105 Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls.

.9 Provide systems which resist air infiltration of no more than 0.03 L/s/m² at a minimum static air pressure difference of 75 Pa in accordance with ASTM E783 Determining Air Leakage Rates of Installed Exterior Windows and Doors.

Provide systems which have an average insulation factor of a maximum of 2.6 W/m²•K in accordance with American Architectural Manufacturers Association 1503 Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.

Provide systems which prevent excess internal passive solar gain to a maximum allowable interior mean radiant temperature of +35°C on the interior lite of insulated glazing units.

.12 Provide systems which accommodate thermal movements for the following maximum change in ambient and surface temperatures:

a) Winter minimum: ambient -20°C, surface -15°C;

Summer maximum: ambient +40°C, surface +55°C; and

Temperature range: ambient 60°C, surface 70°C difference.

.13 Provide systems which are supported by an aluminum framing structure; and only use fasteners which are:

concealed;

corrosion resistant;

c) non-staining; and

compatible with adjacent materials.

.14 Provide glazing with high performance low-e coatings that maximize visible light transmittance and provide thermal properties appropriate for the energy performance of interior spaces;

Provide glazing which has visibility fritting on glass on all vertical elements in passenger and pedestrian flow areas to alert persons to the presence of transparent surfaces;

Provide systems which are supported on a reinforced concrete curb of a minimum of 150 mm and maximum of 300 mm high when extending to grade; and

c) Provide laminated safety glass within 3 m of finished floor using heat strengthened glass incorporating ionoplast structural laminating film or similar products that provide similar stiffness and glass retention.

6.9.12 Aluminum Windows

Aluminum windows will comply with all applicable Standards, including the Aluminum Association Standards (AAS) and the American Architectural Manufacturers Association (AAMA) field testing specifications.

Incorporate in windows a drained and vented system complete with air and vapour seal, allowing any water entering the framing/system and the glazing detail cavities to drain to the exterior and also allow air into the pressuring chamber.

All exterior windows to be sealed double glazed units.

.4 Provide windows that incorporate a thermal-break.

.5 For exposed aluminum surfaces, provide a finish that is permanent and resistant to corrosion resulting from weather exposure and climate.

.6 Provide assemblies that resist local seismic conditions and 1-in- 100 year climatic events (with a safety factor).

6.9.13 Roof Hatches

Minimize use of roof hatch accesses per Section 5.4.1.3(4). If roof hatches are used to provide access to the roof for maintenance:

Provide access ladders and ships ladders;

The minimum hatch size will be 762 mm x 762 mm; and

.4 All roof hatches to be thermally insulated.

6.9.14 Entrance Mat Wells

Provide a recessed, integrated mat well at major entrances with built in drainage.

6.9.15 Glass and Glazing

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.

Exterior and/or interior glass and glazing may be provided as integral components of the exterior envelope, interior partitions and screens, exterior and interior doors, handrail balustrades, skylights and decorative and ornamental glazing.

.3 Provide assemblies that resist local seismic conditions as a post- disaster Building as defined in the BC Building Code.

.4 Provide assemblies that resist 1-in-100 year climatic events (with a safety factor).

Use laminated safety glass in entry doors and sidelights

.6 For the Psychiatric Inpatient Unit, and Psychiatric Intensive Care Unit (PICU) inpatient rooms and Emergency Department Psychiatric and Evaluation Stabilization Zone (P.E.S), provide glass and glazing that meets the requirements of the British Columbia Ministry of Health Hospital-Based Psychiatric Emergency Services Standards.

.7 Glass and glazing in Psychiatry areas must have a minimum of 454 kg (1000lb) resistance and in Secure areas a minimum of 907 kg (2000lb) resistance. Refer to Appendix 2A Clinical Specifications.

6.9.16 Mirrors

For full wall unframed mirrors, use 6 mm thick minimum float glass backed with electrolytically-applied copper plating. Grind smooth and polish all edges.

.2 For wall mounted posture mirrors, use framed type; one piece, stainless steel channel frame with a No. 1 quality, 6 mm thick float glass mirror backed with electrolytically applied copper plating. Back with galvanized steel.

.3 Provide and install dome mirrors in hallways where cross traffic and congestion can occur for safety of transport of supplies, equipment and patients and safe travel by hospital personnel.

.4 Provide dome mirrors at intersections and corners where users who are hard of hearing or deaf will see that traffic is coming towards them.

6.9.17 Finish Hardware

General

Finish hardware will comply with all applicable Standards, including the quality Standards of the Door and Hardware Institute (DHI).

Provide all finish hardware from one supplier that is Cantech compatible and is a member in good standing of the Door and Hardware Institute (DHI) with one or more AHC (Architectural Hardware Consultant) in its employ.

c) Hardware will be integrated with the security requirements and coordinated with electrical wiring and power requirements.

Select finishes to provide maximum longevity and preservation of the finish.

Provide, where applicable, ULC-listed hardware for the required fire rating and compatible with cleaning and disinfection products.

f) Use heavy-duty commercial quality hardware; locksets and latchsets fully mortised type and lever handles of solid material.

g) All doors with maglocks must have a key override on both sides of the door.

h) For special areas provide hardware to suit the purposes unique to those areas. Hardware in the Psychiatry components will comply with the British Columbia Ministry of Health Standards for Hospital- Based Psychiatric Emergency Services: Observation Units.

All hardware, including door strikes, in special areas such as: Psychiatry Inpatient Unit, PICU and the PES unit in the Emergency Department, will be ligature resistant.

j) In areas such as Perinatal and Pediatric Inpatient Unit, where infant and child

abduction is a possibility, provide hardware that can interface with an electronic Infant Protection system. This system is to be selected and coordinated with the Owner.

k) Provide hardware for storage and cupboards to be accessible and used by users with limited mobility.

6.9.18 Keying

Supply and install ASSA key cylinders, or pre-approved cylinders of equivalent quality, 6 pin (factory pinned).

Implement a 4-level system.

Keying groups will be assigned by the Participants.

New key fittings will be given to and controlled by the Owner representatives.

Develop a keying schedule in consultation with the Owner.

Turn over keys from factory to the Owner.

Supply four (4) keys for each lock cylinder.

6.10 Finishes (Division 9)

6.10.1 Basic Requirements

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.

For areas in which wear is a concern, such as areas with anticipated pedestrian or wheeled traffic, use durable finish materials able to withstand damage and easily replaceable in sections if damage does occur.

Give priority to infection prevention and control in the selection of finishes for all patient care areas. Acoustic characteristics of finish materials will also be a priority consideration.

Select the appearance of finishes and colours to create and promote a natural healing environment, prevent glare, and minimize artificial lighting requirements.

.5 Placement of colour within a space shall not interfere with patients' skin pallor/complexion or interfere with the diagnosis or treatment of a patient.

.6 Select materials to promote sustainability by, for instance, having low-emissivity or comprising of renewable resources.

.7 Select finish materials that do not use known carcinogenic material or chemicals in their manufacture or disposal. Consult the Green Guide for Healthcare.

Select finishes with a low toxicity and durability. Preference for products with and environmental product declaration and not on the IUCN Red List.

6.10.2 Performance Criteria

Interior Wall Framing

a) 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 gypsum board ceiling suspension systems.

System Design and components will meet seismic restraint requirements for a post-disaster Building where applicable.

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.

Construct steel stud framing to accommodate electrical, plumbing and other services in the partition cavity, and to support fixtures, wall cabinets, medical equipment and other such wall-mounted items.

e) Provide reinforcement and backing throughout.

Design for 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.

Coordinate with all supplied equipment to confirm location of wall mounts for equipment and furnishings. Provide backing for handrails, grab-bars, wall protection and other similar items. Identify areas for mounting artwork and other display items that would require backing.

h) Airborne Isolation Room (AIR) Construction to be as follows:

comply with HVAC system requirements in CAN/CSA-Z317.2 including relative pressurization;

ensure wall and ceiling Construction is sealed around all wall and ceiling penetrations to maintain pressurization; and

ensure 3 panel doors and interior windows are sealed to maintain pressurization.

Gypsum Board

Gypsum board will comply with all applicable Standards, including the Association of Wall and Ceiling Contractors of B.C. (AWCC) Wall & Ceiling Specification Standards Manual.

Gypsum board will be no less than 16 mm in thickness.

Use cementitious backer board (tile backer board) behind ceramic wall tile in showers or other wet areas. Use glass mat water- resistant gypsum backing panels behind sinks.

Provide abuse-resistant gypsum board in corridors with heavy patient, cart or equipment traffic, to be located on the bottom 1200mm of the corridor wall, in order to increase resistance to abrasion, indentation and penetration of interior walls.

e) Use glass mat surfaced gypsum sheathing board wherever exterior gypsum sheathing is required at exterior walls.

Provide airborne sound insulation for gypsum board/steel stud assembly to close off air leaks and flanking paths by which noise can go around the assembly. Make assemblies airtight. Do not locate back to back recessed wall fixtures such as cabinets or electrical, telephone and television outlets and medical gas outlets, which perforate the gypsum board surface. In addition, carefully cut any opening for fixtures to the proper size and appropriately seal piping penetration. Seal conduit/duct/piping penetrations with tape and fill at the plenum barrier. Make the entire perimeter of a sound insulating assembly airtight to prevent sound flanking.

Use an acoustic caulking compound or acoustical sealant to seal between the assembly and all dissimilar surfaces (including at window mullions) in accordance with the recommendations of an acoustic consultant.

Gypsum board with a non-combustible moisture resistant core and moisture and mold resistant face and back papers will be used in all areas of the Facility except for those areas referred to in 6.10.2.2.c) and 6.10.2.2.e).

Ceilings

Acoustic Tile Ceilings

i) Acoustic ceiling tiles in metal suspension system will be used in at least the following locations:

- Corridors;
- Offices, meeting rooms;
- Common lobby, registration areas;
- Waiting areas;
- Quiet rooms;
- On call rooms;
- Gift shop;
- Examination rooms;
- Clean and storage rooms
- Patient and staff lounges; and
- Other areas requiring a non-institutional finish.

Acoustic Panel: Non-directional, fissured pattern, Imperial dimension white ceiling panel, trim edge detail (square) or regular edge to fit a standard 15/16" T-bar grid panel size.

Install acoustic ceiling tiles in the suspension system that comply with the requirements of CSA Z8000 and provide the levels of sound attenuation required to suit the intended function of the room.

iv) All acoustic tile ceilings used in spaces which do not have special cleaning, maintenance or environmental needs (as in food preparation areas or high temperature / humidity areas) to have a Noise Reduction Co-efficient of 0.80 or greater.

Provide accessibility to the ceiling spaces where access is required to mechanical, electrical or other service systems.

Special surface-treated ceiling tiles, such as mylar, vinyl- faced or metal-faced tiles, may be used where maintenance and ease of cleaning are priorities as well as the accessibility and acoustic requirements.

Provide acoustical panels that are appropriate for the normal occupancy condition range of 15°C - 29°C and maximum 70% relative humidity. When the service use temperature and relative humidity are expected to exceed these ranges, consider use of acoustical units specifically Designed for such applications.

Use tiles with scratch-resistant surfaces in any area where lay-in ceiling

panels frequently need to be removed for plenum access.

For ceilings installed in food preparation areas, use a gypsum board ceiling.

x) Provide acoustic ceiling tile mock-up with conditions representative of all Facility's conditions including corners, mouldings, and transitions.

Integrated Pre-Engineered Ceiling Grid System Alternate

Design basis is a gypsum board solid surface ceiling. Participants to review and provide alternate solution as an integrated pre engineered ceiling grid if acceptable.

Comply with ASTM C636 requirements for the pre engineered metal ceiling suspension system.

In the Operating Rooms, provide and install a continuous gasketed, smooth, prefinished, metal panel T-bar ceiling system for easy access to the plenum, with an integrated ceiling solution for mechanical, electrical, overhead boom and surgical lighting systems. Comply with ASTM B209.

Provide and install a gasketed, smooth, prefinished, metal panel T-bar ceiling solution in high humidity areas of the Medical Device Reprocessing Department (MDRD).

c) Hard Ceilings

Construct hard ceilings of 16 mm gypsum board where fire rating is not required. In fire rated rooms the gypsum board must be fire rated and the thickness of the gypsum board is to be determined by the rating required by the BC Building Code. Finish hard ceilings as per the paint specifications outlined in 6.10.2.4.

ii) Provide monolithic finished ceilings for the following rooms:

- Airborne Isolation Rooms, bathrooms and anterooms;
- inpatient bedrooms and bathrooms and Secure rooms for Psychiatry patients;
- three-piece washrooms;
- Operating Rooms and associated clean and sterile corridors and core areas;
- Procedure Rooms;
- MDRD;
- Morgue;
- clean and sterile storage areas;
- inpatient galley kitchens and Food Services;
- specialized radiographic rooms; and
- other clean-room areas such as labs and pharmacy areas (as per accreditation or other Standards requirements).

In special areas such as Psychiatry, construct the ceiling in accordance with British Columbia Ministry of Health Standards for Hospital-Based

Psychiatric Emergency Services: Observation Units.

Pharmacy Vault Ceilings

- Cast-in-Place Concrete Ceiling/Floor: Nominal 101mm (4") poured concrete (20.7 MPa (3000 lb/in2) minimum) reinforced with N 5 (15 mm (5/8")) deformed steel reinforcing bars every 20 cm (8") in both directions or reinforced with 3.5 mm (10 gauge) expanded metal mesh which has opening 5 x 2.5 cm (2" x 1"), in accordance with Health Canada Directive On Physical Security Requirements For Controlled Substances, edition 1999.

Access Panels

Where hard ceilings are used, provide access panels to allow for mechanical and electrical servicing in the ceiling.

Access panel to be prefinished.

Ceiling Virtual Skylights

Create photographic views of the natural landscape or sky view in the ceiling mounted in a rectilinear luminous sky ceiling type system.

Provide the luminous panels in a suspended ceiling grid system, with back lighting.

Integrate the ceiling virtual skylight system with the adjacent ceiling areas to create a calming distraction for patients lying on treatment tables.

Luminous panel surface to be smooth to facilitate cleaning.

Install at a minimum LED ceiling panel murals in the ceiling of the CT and MRI imaging rooms to provide visual relief and distraction.

Flooring

All Rooms Except Wet Rooms and Concrete Floor Finish Spaces

Use solid homogeneous sheet flooring (or an equivalent product approved in advance by the ALT) unless specified otherwise.

Hot weld all joint seams to create a smooth surface with no ridges or crevices.

Form coved bases 150 mm high, straight cut, finished with clear silicone caulking. Do not cap.

Butterfly v-plug joints on all sheet flooring corners

Use water soluble, low odour flooring adhesive.

Where there is no existing product to butt against, finish edging finish with vinyl finishing strip as per manufacturers' specifications.

Finish flooring with high speed buffing as per manufacturers' specification. Do not apply sealer or wax.

Concrete Floor Finish Spaces

Provide densified concrete floor finish in back of house locations subject to high traffic, including receiving/loading bays, and clean and soiled service corridors leading to Materiel Management and Loading Dock.

Provide concrete densifier and chemical hardener that is ready-to-use, liquid applied anti-dusting treatment, concrete densifier and chemical hardener that does not require surface rinsing or brushing; water based, colourless liquid formulated with chemically reactive lithium-silicate compound.

Concrete flooring in Materiels Management and Equipment Depot must be sealed and able to withstand frequent cleaning and disinfection with hospital grade cleaners and disinfectants.

Wet Rooms

Use slip-resistant solid sheet flooring (or an equivalent product approved in advance by the ALT) for all wet rooms.

Hot weld all joint seams.

Form coved bases 150 mm high, straight cut, finished with clear silicone caulking. Do not cap.

Butterfly v-plug joints on all sheet flooring corners

Use solvent based, low odour flooring adhesive.

Hot weld new flooring to existing floor product.

Finish flooring as per manufacturer's specification. Do not apply sealer or wax.

Stair Covering

i) Use one piece treads and sheet risers with Carborundum strip or an alternate Designed for the visually impaired; and

ii) Use water soluble, low odour adhesive.

Comply with all applicable Standards, including the National Floor Covering Association (NFCA) Specification Standards Manual. US Federal Specification RR-T-650d.

f) Flooring materials must be selected to retain their appearance, durability and functionality, to withstand hospital cleaning and maintenance with IPAC approved cleaners and disinfectants, to not deteriorate with continuous pedestrian and rolling traffic, to provide acoustical environmental benefits, and to contribute to the maintenance of infection prevention and control Standards.

The Participants must demonstrate the functional characteristics of each of the flooring materials to achieve the Owner's operational requirements prior to final selection and installation.

h) Where epoxy flooring is used in wet areas, use water and slip- resistant grade and prevent water or moisture transmission to the substrate.

i) Terminate flooring at the walls in the form of 150 mm high flash coves.

j) Use heavy-duty materials for flooring on which wheeled, or service vehicle traffic is anticipated, and to which wear and damage may result.

Use permanent, heavy-duty integral materials such as seamless epoxy quartz

flooring for flooring in areas subject to moisture and heat over extended periods of time.

l) Use suitable flooring in patient and staff areas where cart or stretcher traffic is expected or where cleaning on a regular or emergency basis is necessary.

Use water resistant and slip-resistant flooring in public, staff, and patient washrooms with integral cove base.

Use heavy duty resilient sheet products for flooring in service corridors and service areas.

o) Use anti-static flooring material for telecommunication rooms.

p) Resilient Flooring

Choose products with exposed surface having anti- bacterial properties to prevent entry of gram-positive and gram-negative micro-organisms. Weld all seams. Provide integral cove bases.

If used, provide slip-resistant sheet vinyl with a static coefficient of friction of 0.6 on level surfaces and 0.8 on ramps.

Use widest sheet flooring rolls available

iv) Do not use linoleum sheet flooring.

Hot weld all seam joints.

vi) Form cove bases 150 mm high, straight cut, finished with clear silicone caulking. Do not cap.

Provide butterfly joints at corners.

viii) Use solvent based low odour flooring adhesive.

Finish flooring with high speed buffing as per manufacturer's specification.

Provide tactile warning strips and stair nosings to assist the visually impaired.

xi) Use adhesive for resilient flooring that meets or exceeds the United States Environmental Protection Agency (EPA) Standards for acceptable VOC concentration and emission rates.

Provide manufacturers' acceptable moisture and humidity test results prior to installation of resilient flooring on concrete slab on grade.

q) Applied Rubber Wall Base

Only use applied rubber wall base where an integral base is not possible. The use of applied rubber wall base should be minimized as to the greatest extent possible.

r) Gymnasium Flooring

Provide a resilient vinyl surface multipurpose sport flooring surface.

Vinyl to be 5 mm thick minimum for shock absorption.

Choose products with exposed surface having anti-bacterial properties to prevent entry of gram-positive and gram-negative micro-organisms. Weld all seams. Provide integral cove bases.

iv) Static coefficient of friction of 0.6 on level surfaces.

Hot weld all seam joints.

Form cove bases 150 mm high, straight cut, finished with prefinished aluminum trim.

Use solvent based low odour flooring adhesive.

Finish flooring with high speed buffing as per Manufacturer's specification.

Seamless Quartz Epoxy Flooring

If used, provide seamless epoxy flooring with 100% solids, zero VOC, solvent-free comprised of a two-component epoxy primer, a two-component epoxy resin and curing agent, coloured quartz aggregate broadcast into both primer and undercoat, and a high performance, UV- resistant two-component, clear epoxy sealer.

Provide integral cove bases.

t) Carpet/ Carpet Tile

The use of carpet is not allowed.

The use of carpet tile is not allowed except for Administration offices.

Carpet tile shall have a surface that is wipeable and repels liquids and is cleanable with hospital-grade cleaners and disinfectants.

u) Wayfinding Markings

Provide durable self-adhesive wayfinding marking for direct application to the floor in accordance with Facility wayfinding strategy.

.5 Acoustic Treatment

Design and construct the Facility to comply with the minimum sound transmission ratings between spaces described in CSA Z8000.

In addition, provide acoustic treatment where sound attenuation, soundproofing or other sound control measures are necessary to create a healing environment for patients and a safe and comfortable environment for staff and where confidentiality is required.

c) Sound control will include:

attenuation of sound within public, patient and staff environments;

sound isolation between the exterior and interior spaces;

sound isolation between interior spaces within the Building at both horizontal and vertical separations;

sound and vibration isolation of Building service noises and sound isolation of Building service rooms;

sound isolation as required for specialty rooms such as video-conferencing. Refer to Appendix 2F UBC FACULTY OF MEDICINE DESIGN GUIDELINES AND FUNCTIONAL REQUIREMENTS FOR Enhanced Clinical Skills Rooms and On-Call Suites;

Design partition and ceiling Construction to provide approximately the same degree of sound control through each assembly. When a partition is used for sound isolation, extend the sound control Construction from slab to slab;

Optimum sound isolation requires that the integrity of gypsum board partitions and ceilings (mass) not be violated by vent or grille cut-outs or by recessed cabinets, light fixtures, as a basic principle of acoustic Construction;

Where penetrations are necessary, minimize placing them back- to-back and next to each other. Stagger electrical boxes and medical gas outlets, preferably by at least one stud space. Use mineral fibre insulation to seal joints around all cut-outs such as electrical, TV and telephone outlets, plumbing escutcheons, recessed cabinets, and bathtubs. Use non setting acoustical caulking to seal where the gaps are too small to insert mineral fibre insulation;

Eliminate ducts, rigid conduits, or corridors that act as speaking tubes to transmit sound from one area to another, especially between patient care and treatment rooms. At common supply and return ducts, provide sound attenuation liners at the diffuser and/or grill to maintain assemblies' STC. Seal around conduit;

x) Isolate structure-borne vibrations and sound with resilient mountings on vibrating equipment to minimize sound transfer to structural materials. Provide ducts, pipes, and conduits with resilient, non-rigid boots or flexible couplings where they leave vibrating equipment; isolate from the structure with resilient gaskets and sealant where they pass through walls, floors, or other Building surfaces; and

Use acoustic screens, vibration isolators, and carefully selected exterior equipment to prevent exterior noise that neighbours may find offensive.

.6 Painting and Protective Coatings

Comply with LEED requirements for Low Emitting Materials Paints and Coatings. In particular:

i) architectural paints, coatings and primers: low VOC.

anti-corrosive and anti-rust: low VOC.

clear wood finishes, floor coatings, stains and shellacs: low VOC.

Walls, doors and shelving

Use eggshell or semi-gloss for all walls, doors and painted shelving.

c) Door frames and metal doors

Use semi-gloss for all door frames and metal doors.

Wood finish doors

Use clear coat interior rub varnish for all wood finish doors.

Paint Grade Doors

Use semi-gloss for all paint grade doors.

Ceilings

Use eggshell paint for all ceilings.

Floors, concrete

Use a 2-component (base component A, curing agent B).

Use a primer if part of coating system.

h) Paint painted patient care areas with a semi-gloss finish.

Conform to all applicable Standards, including the material and workmanship requirements of Master Painters Institute (MPI) Architectural Painting Specification Manual.

Use exterior paints of a quality Designed to protect substrate materials from weather and climate conditions.

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.

l) Treat exterior masonry materials such as brick and concrete block with water-repellent coatings to prevent water ingress into or through the material.

m) Provide a special protective coating on exterior and interior materials that are subject to corrosion from exposure to moisture or other corrosive agents, and where painting is deemed to be insufficient protection. Materials requiring a special protective coating include exterior and interior structural, galvanized, and miscellaneous steel.

Use paints with a minimal VOC level in patient, staff, and public interior areas.

o) Use interior paint materials of a quality to withstand regular or repeated cleaning as the function of the area dictates with Owner's cleaning and disinfectant products.

p) Paint handrails, doors, and frames with a contrasting colour from walls in consideration of the visually impaired.

q) Do not use materials containing lead and mercury.

r) If seamless epoxy wall coatings are used, provide a two-component, high solids, zero or low VOC, solvent-free, epoxy glaze wall coating that is seamless and abrasion, chemical, and UV-resistant.

.7 Wall Protection

Thermoplastic Sheet (TPS)

Provide a smooth, continuous sealant where sheets abut. Trims are not to be used.

Semi-Rigid PVC (SRP)

Heat weld all SRP joints with a 4mm diameter soft welding cord of type and techniques recommended by manufacturer. Colour to match wall covering colour.

ii) Thermoform corners in wet and IPAC sensitive areas.

In wet areas sheet should be scribed to provide a tight and neat joint at integral sheet flooring base for heat weld seaming in wet areas.

.8 Vinyl Acrylic Wall Covering

Vinyl surface covering (vinyl /acrylic wallpaper or wall protection sheets) shall not be used in locations where there is a risk of moisture migrating through the wall behind the sheet.

Where vinyl/acrylic wall covering is used, provide vinyl/acrylic high impact rigid sheet, nominal 0.40" thickness with colour-matched vinyl/acrylic trim for joint/transitions.

Furnish complete packaged system containing all primers and adhesive.

Use non water-based and non-hazardous primer and adhesive materials.

.9 Dry Erase Wall Covering

Provide in meeting rooms throughout the Building pigmented gloss vinyl wall covering presentation surfaces for dry erase markers, 0.61 kg/sq.m. non-woven backing.

Provide trim and other accessories including but not limited to wall covering trim of anodized aluminum, low profile trim, plastic marker dispensers, dry erase markers (set of 4 colours), low odour, and eraser, magnets, clearer, towels.

.10 Graffiti and Stain Resistant Coatings:

a) Provide materials that are non-sacrificial and fully permeable;

Provide materials that can not be altered by nominal ten (10) washing of tags via typical custodial and maintenance activities;

Provide materials that are formulated to prevent staining agents or their residue from altering the look of the substrate;

Provide materials that do not change the appearance of the materials they are applied to;

Provide materials that do not darken the appearance of porous surfaces;

Provide materials that protect substrates against staining agents, including:

blood;

inks;

iii) permanent markers;

spray paint;

urine; and

vomit.

.11 Coatings for Galvanized Steel

Galvanized steel surfaces to be coated shall be prepared to SSPC-SP16 in accordance with CISC standard and the selected finish system.

Provide coatings for galvanized steel which are compatible with the substrate, have a minimum gloss level of G6 in accordance with the selected finish system, and consist of:

a high solids polyamide epoxy primer;

a polyester modified, aliphatic acrylic polyurethane intermediate coat; and

a polyester modified, aliphatic acrylic polyurethane finish coat.

All edges shall be stripe coated to maintain dry film thickness.

6.11 Specialties (Division 10)

6.11.1 Basic Requirements

Provide specialty products manufactured for the specific purposes intended and installed in strict accordance with the manufacturers' directions.

6.11.2 Whiteboards

Provide, as required in Appendix 2I Equipment and Furniture:

whiteboard surfaces that allow use of felt-type writing instruments and allow erasing and cleaning with minimal effort; and

use porcelain ceramic on steel surface, magnetic, scratch and abrasion-resistant and have maximum contrast, glare control, and reflectivity.

Provide whiteboards with extruded aluminum frames, accessory trays, map rails and map hooks.

Use non-toxic, water based lamination adhesive for whiteboards.

6.11.3 Projection Screens

Provide, as required in Appendix 2I Equipment and Furniture:

Projection screens mounted from recesses in ceilings or wall mounted; and

where appropriate, provide for motorized screens.

Provide supports and power as required to coordinate with mobile or fixed Projector units, including ceiling mounted Projectors.

.3 Provide for trims and finishes compatible with the interior Design of the rooms.

6.11.4 Compartments and Cubicles

.1 Provide compartments and cubicles including toilet partitions, change cubicles, shower partitions, and other compartments and cubicles requiring privacy and security.

.2 Provide exposed surfaces that are permanent, water-resistant, corrosion-proof, and readily cleaned, disinfected and maintained.

Secure partitions and Standards to the floor or ceiling structure, and in a manner to resist lateral loading and impact.

.4 For compartment/cubicle doors, use material matching the partitions and include permanent, purpose-made hardware. Design doors and hardware to provide barrier-free access.

Provide a mirror in all change compartments that is smooth with a seamless frame, easily cleaned and disinfected.

6.11.5 Toilet Partitions

Galvannealed sheet metal will conform to ASTM A653 with minimum ZF001 (A01) zinc coating. Finish in polyester, baked enamel or powder coating.

For stainless steel, use Type 304 conforming to ASTM A240 with No. 4 finish.

.3 For plastic laminate, use Grade 10/HGS GP50 scuff-resistant, high pressure laminate, conforming to NEMA LD-3.

.4 Avoid use of particleboard core partitions.

For fibre-reinforced plastic (fibreglass), use a moisture resistant grade.

Solid Phenolic with laminate or stainless steel finish.

6.11.6 Change Cubicle Partitions

Where not adjacent to showers, change cubicle partitions will comply with the above requirements for toilet partitions.

6.11.7 Shower Partitions

Use solid phenolic laminated thick stock, factory-laminated with decorative finish both faces of core and conforming to CAN3-A172 or NEMA LD3.

6.11.8 Metal Lockers

Provide individual and shared storage facilities in Designated staff and patient areas in the Facility based on expected staffing requirements as described in Appendix 2A Clinical Specifications and as appropriate for operation of the Facility. Sizes, numbers, and groupings to be determined in consultation with the Owner.

.2 Such storage facilities to be Z type lockers with keyless digital locks complete with a master override. Lockers will include a mix of full height, half size and purse lockers.

.3 For sheet metal, use galvannealed steel conforming to ASTM A653 with ZF001 (A01) zinc coating.

.4 Lockers will be provided with 150 mm high masonry bases finished with an integral cove floor finish.

Lockers will fit tightly below gypsum board bulkheads or be complete with sloped metal tops.

.6 Finish steel surfaces with polyester baked enamel or powder coating.

.7 For single, double, or multiple-tier metal lockers for staff use, include a provision for locking with padlock, and complete with number plates, and hanging hooks.

6.11.9 Storage Shelving Systems

Provide storage systems for materials in Designated storage areas listed in the Appendix 2A Clinical Specifications.

.2 Adjustable shelving systems may be specifically manufactured for storage purposes, such as plywood or steel-slotted angle industrial shelving for bulk materials and plastic laminate- faced plywood for clean storage.

For mobile storage systems, provide a high-density system Designed to make maximum use of available space by eliminating need for access aisle for each run of shelving. Refer to Appendix 2I Equipment and Furniture.

.4 Install and brace systems to resist seismic loads. The mobile storage system to be either power assisted or to be easily operable without undue required strength by any person.

Provide heavy duty storage systems for shelving for inventory storage in Materiel Management.

.6 Refer to Clinical Storage section 5.5.11 for supplies stored in Clean and Sterile supply rooms.

6.11.10 Washroom Accessories

Provide washroom accessories as required in Schedule 2 for in all public, patient, and staff washrooms. Washroom accessories will be supplied and installed by the Participants but must be compatible with consumables in use through PHSA purchasing.

.2 Determine the type, size, and number of accessories and placement on walls with regard for the numbers and categories of users, in consultation with the Owner.

Install washroom accessories to allow cleaning and maintenance of the accessory and surrounding wall area and to avoid splash contamination.

.4 Accessories with appropriate safety features will be selected for Psychiatry and other areas where there is increased risk of patient injury and in accordance with British Columbia Ministry of Health Standards for Hospital- Based Psychiatric Emergency Services: Observation Units.

Recessed dispensers (such as those for paper towels, soap and waste receptacle) will not be used.

.6 Use commercial grade accessories free from imperfections in manufacture and finish.

Use fittings with concealed fastening for security and discouragement of tampering.

.8 One public washroom close to the Lobby will be Designed for and contain an adult change table.

.9 Staff and public washroom accessories will include the following:

soap dispensers;

toilet paper dispensers;

c) paper towel dispensers – "hands free" type, surface mount units;

paper towel disposals;

mirrors, at least one of which is barrier-free in each public washroom;

barrier-free grab bars (with integral tactile grip finish);

g) coat hooks;

h) sanitary napkin dispensers;

i) sanitary napkin disposals;

j) baby change table;

sharps containers; and

stainless steel utility shelf, minimum 150 mm x 400 mm, in each compartment.

Patient washroom accessories will include the following:

soap dispensers;

toilet paper dispensers, hung directly from grab bars;

c) paper towel dispensers, surface mount units;

paper towel disposals;

e) barrier-free fixed tilt mirrors;

barrier-free grab bars (with integral tactile grip finish);

coat hooks;

sharps containers; and

i) stainless steel utility shelf, minimum 150 mm x 400 mm, in each compartment.

Shower rooms or showers in washrooms will include the following accessories:

handicap grab bars; and

soap and shampoo stainless steel utility shelf.

.12 Accessible shower rooms for staff will contain a bench.

6.11.11 Privacy Glazed Partitions

.1 Provide fixed glazed partitions in open bed bays in accordance with the Appendix 2A Clinical Specifications.

.2 Fixed glazed partitions to allow for enhanced patient acoustic privacy while allowing for visual supervisions by staff.

6.11.12 Folding Panel Partitions

.1 Provide folding panel partitions with acoustic seal for subdividing the EOC conference rooms in accordance with Appendix 2A- Clinical Specifications.

.2 Provide an access door in each folding panel partition to allow access from meeting room to meeting room.

.3 Provide folding partition to provide privacy between patients in Patient Bedroom-Semi-Private and Oncology and medical infusion bays in accordance with Appendix 2A Clinical Specifications.

6.11.13 Inpatient Bed Headwalls

In private inpatient rooms, Design the head wall adjacent to the inpatient bed:

to allow for one oxygen connection, one medical air connection and one vacuum connection on each side of the bed, for a total of 6 medical gas outlets. Refer to Appendix 2A Clinical Specification for complete list of requirements;

b) to meet or exceed all relevant CSA and ULC codes and regulations for the full range of requirements for an acuity adaptable direct patient care area and environment;

c) to provide all rails, accessories and backing required for mounting monitors, baskets, and other equipment as required;

to provide bed dock locators behind the bed;

to allow for data, communication and electrical power outlets on both sides of the bed (refer to the Clinical Specification and Electrical for the required number of outlets);

to provide one nurse call station button and one Code Blue button; and

g) so that medical gases, service outlets, rails, equipment and accessories are configured in a horizontal and modular system, which may be either a horizontal modular headwall strip or a complete wall unit.

.2 In double occupancy Semi-Private inpatient rooms provide two headwalls, each of which must comply with the requirements of Section 6.11.13.1

.3 In Bariatric rooms provide two headwalls that comply with the requirements of section 6.11.13.1, one Bariatric headwall behind the Bariatric bed and the other standard headwall on the opposite wall, in order to support a second inpatient bed during over capacity.

.4 The components of the Bariatric headwall will be spaced to allow full coverage from the Bariatric bed.

6.11.14 Electric Fireplace

.1 Provide manufactured electric fireplaces in the located identified in Appendix 2A-Clinical Specifications.

Fireplaces will have all components and accessories for a complete, functional unit listed with a UL or WHI rating and will be front view, opening-sealed unit and non-venting, with a fire on/off switch, log set and log grates.

6.11.15 Mail Slots

.1 Provide mail slots that are a minimum of 25mm wide, 350mm high and 400mm deep, in locations identified in Appendix 2A Clinical Specifications.

6.11.16 Dome Mirrors

Provide and install dome mirrors as required to prevent congestion and accidents in corridors as required.

6.11.17 Lead apron Racks

Provide and install lead apron racks in:

Medical Imaging;

Perioperative Suite; and

and as required in the Appendix 2A Clinical Specification.

6.11.18 Coat Hooks

.1 Provide and install coat hooks behind doors in all offices.

.2 Provide and install coat hooks in all locker rooms. Provide one per locker.

6.11.19 Pass Through Window

Refer to Appendix 2A Clinical Specifications.

.2 Provide and install pass through windows at a minimum in:

a) Pharmacy Satellite to the oncology treatment area;

Perioperative Suite;

Laboratory;

Utility Room Soiled into Utility Room Clean;

Airborne Isolation Ante Room into Airborne Isolation Room; and

as required in Appendix 2A Clinical Specifications.

6.11.20 Personal Protection Equipment (PPE) Dispensers

Provide and install recessed wall mounted PPE dispensers as required by Owner and in locations as indicated in the Appendix 2A Clinical Specifications.

.2 Location and product to be determined in consultation with IPAC and OH&S.

.3 Provide medical PPE supply recessed wall cabinets.

6.12 Equipment (Division 11)

6.12.1 Patient Lifts General

.1 The Participants will provide Bariatric and non-Bariatric patient lifts that meet the requirements set out by Appendix 2M Patient Lift Matrix. All lift and transfer devices shall be manufactured in accordance with CAN/CSA-Z10535.1.

.2 Provide secure lockable cabinets for patient lift motors in Paediatric and Psychiatric inpatient rooms. Cabinets to be millwork with electronic lock.

The patient lift system will be a combination of X-Y gantries in all patient bedrooms and washrooms and a connecting single-track lift. The single-track lift connection to each of the room gantries will allow the patient to be transferred from one room to the other with minimum inconvenience to patient and staff.

6.12.2 Bariatric Patient Gantry Lifts

.1 The Participants will Design and construct the Facility to include Bariatric patient lifts that have a patient load bearing capacity of 454 kg at the room locations indicated in Appendix 2M Patient Lift Matrix.

.2 The Participants will Design and construct all Bariatric patient lift systems so that any traverse will accommodate safe transfer of a Bariatric patient.

.3 The Participants will Design and construct a lift solution that provides continuous coverage of entire Inpatient Room and Toilet-Shower Room. The patient lift system will allow patient pick up from all areas of the inpatient bedroom including the bathroom with complete access to the toilet, sink and shower.

The lift will centre the patient on the middle of the toilet and access the bathroom so that the patient is centred in the middle of the door frame.

6.12.3 Bariatric Patient Gantry Tracks

The Participants will provide ceiling mounted X-Y gantry tracks with a load bearing capacity of 454kg.

6.12.4 Standard Patient X-Y Gantry Lifts.

The Participants will Design and construct the Facility to include standard patient lifts that have a patient load bearing capacity of 284kg at the room locations indicated in Appendix 2M Patient Lift Matrix.

.2 The Participants will Design and construct all non-Bariatric patient lift systems so that any traverses will be manual and will accommodate safe transfer of a patient by one Owner's staff member.

The Participants will Design and construct a lift solution that seamlessly provides continuous coverage of entire Inpatient Room and Toilet-Shower Room. The patient lift system will allow patient pick up from all areas of the inpatient bedroom including the bathroom with complete access to the toilet, sink and shower.

.4 The lift will centre the patient on the middle of the toilet and access the bathroom so that the patient is centred in the middle of the door frame.

.5 Standard Patient Gantry Tracks. The Participants will provide ceiling mounted X-Y gantry tracks with a load bearing capacity of 284kg.

6.12.5 Single Track Bariatric Lifts

The Participants will Design and construct the Facility to include Bariatric patient lifts that have a patient load bearing capacity of 454 kg at the room locations indicated in Appendix 2M Patient Lift Matrix.

.2 The Participants will Design and construct all Bariatric patient lift systems so that any traverse will accommodate safe transfer of a Bariatric patient.

The patient lift system will allow patient pick up from clinical areas with access to the toilet, sink and/or medical equipment.

The track will centre the patient on the middle of the toilet and access the bathroom so that the patient is centred in the middle of the door frame.

.5 The single track lift system will be provided in workshop areas as identified in Appendix 2M Patient Lift Matrix.

.6 The Participants will provide ceiling mounted tracks with a load bearing capacity of 454kg.

6.12.6 Single Track Lifts

The Participants will Design and construct the Facility to include standard patient lifts that have a patient load bearing capacity of 284kg at the room locations indicated in Appendix 2M Patient Lift Matrix.

.2 The Participants will Design and construct all non-Bariatric patient lift systems so that any traverses will be manual and will accommodate safe transfer of a patient by one Owner's staff member.

.3 The patient lift system will connect to the X-Y gantry lift allow patient transfer from the inpatient bedroom into the bathroom with complete access to the toilet, sink and shower.

.4 The track will centre the patient on the middle of the toilet and access the bathroom so that the patient is centred in the middle of the door frame.

The Participants will provide recessed ceiling mounted tracks with a load bearing capacity of 284kg.

6.12.7 Lift Coordination

.1 For all lifts locate the lift charger in an area that is out of high traffic areas and does not interfere with daily operations. Location will not conflict with fixtures and will maintain clear accessibility of floor below.

.2 Coordinate patient lifts to not interfere with the operation of lighting and other ceiling elements as well as any furniture in the vicinity of transfer.

.3 Provide wall mounted bracket for hand control and lift sling. Locate in an area that is out of high traffic areas and does not interfere with daily operations. Location will not conflict with fixtures and will maintain clear accessibility of floor below.

6.12.8 Cadaver Storage

Refrigerated Storage

Provide mortuary refrigerated body storage for the Morgue for 8 to 9 cadavers with individually locking bays as follows:

Double Stacked Bays : Provide 2 double stacked bays for storage of (4) Bariatric cadavers ,each bay capable of supporting 454kg/body ; 750mm wide;

Triple Stacked Bays : Provide 2 triple stacked bays for storage of (6) bodies, each bay capable of supporting 180kg/body ; 660 mm wide.

.2 Freezer Storage

Provide freezer storage for 4 cadavers as follows:

Double stacked Bay: Provide one double stacked bay for storage of 2 cadavers capable of supporting 180kg/ body 660mm wide;

Double stacked Bay: Provide one double stacked bay for storage of 2 cadavers capable of supporting 454kg/body 750mm wide.

Lift

Provide 454 kg lift for loading bodies in and out of storage units.

6.12.9 Vented Fume Hoods

Provide and install fume hoods, biosafety hoods, laminar flow hoods as required for the Laboratory, Pharmacy and Biomedical Engineering.

.2 Refer to Appendix 2A Clinical Specification: fume hoods will contain the following: variable air, compressed air, cup sink, electrical outlets, low velocity alarm, gooseneck water faucet, vacuum, and monkey bar mounting system and other gases as required.

6.12.10 Exhaust Fans

Provide exhaust fans for residential stoves in Indigenous Health, Spiritual Health - Indigenous Patient Liaison - Teaching Kitchen and - Therapy Services- ADL Kitchen/Dining/Bed/Toilet Area.

6.12.11 Biosafety Cabinets

Provide biosafety cabinets in Ambulatory Care/ Day Programs. Refer to Appendix 2A Clinical Specifications.

6.12.12 MDRD Vertical Carousel

Provide a vertical storage carousel in the MDRD. Provide ceiling clearance and structural support as required by manufacture's recommendations.

6.12.13 Pharmacy Dispensing Carousel

Provide a pharmacy dispensing carousel in the Pharmacy. Provide ceiling clearance and structural support as required by manufacture's recommendations.

Carousel Storage System that delivers goods to an operator at an ergonomic work counter. Provide secured access. Design to provide fast and frequent access to like-sized parts.

6.13 Furnishings (Division 12)

6.13.1 General

In addition to the Participants obligation to provide Classification A, B and E equipment, the Participants will provide and install all millwork, modular casework, clinical systems furniture, systems furniture, furniture and accessories as required to support the programs and functions described in Appendix 2A Clinical Specification or as required to support the operation of the Building.

.2 Appendix 2L Room Finishes Matrix lists the locations in which millwork, modular casework, clinical systems furniture, and systems furniture are required. Attachment 2I-1 Equipment and Furniture also lists systems furniture and/or furniture that is required.

Participants will provide and install millwork, modular casework, clinical systems furniture, systems furniture and/or furniture.

.4 The Participants will coordinate and submit layouts and configurations to the Owner.

6.13.2 Millwork

Millwork means custom fabricated wood or metal cabinetry and counter components and accessories that are installed with little or no modification.

.2 Millwork may require mechanical, electrical power and data service connections.

Millwork must have rounded, seamless soft corners and edges and be able to withstand frequent cleaning and disinfection with Owner's cleaning and disinfection products.

.4 Millwork can include but are not limited to work surfaces (such as counters and work benches) and storage (such as cabinetry, files, drawers, wardrobes and cabinets).

.5 The Participants will provide and install the following as millwork:

kitchen and pantry counters, upper and lower cabinets, drawers and shelving:

i) provide only two drawers in galley kitchen;

do not locate cabinets directly above sinks; and

iii) kitchens to meet B651 standard.

The Participants will provide and install the following as millwork:

utility room counters, storage cabinetry and shelving;

workroom counters and storage and work benches in shops;

security kiosks;

reception desks;

information desks;

vanity counters containing sinks; and

any other locations identified in Appendix 2A Clinical Specifications.

6.13.3 Modular Casework

Modular Casework means a composition of factory produced, quickly installed parts that are easily replaceable, reconfigurable and interchangeable. Casework can be rearranged to change configuration or to include additional modules as needed.

Modular Casework may require mechanical, electrical power and data service connections.

.3 The Participants will provide and install the following as modular casework:

lab casework;

pharmacy casework;

medication room work surfaces, upper and lower cabinetry, shelving and storage

components; and

clinical, exam and treatment room counters, upper and lower cabinets, shelving and storage.

6.13.4 Clinical Systems Furniture

Clinical Systems Furniture means a factory produced, component system Designed to be replaceable, reconfigurable, height adjustable and interchangeable, and Designed for specific use in health care facilities. Clinical furniture systems can be rearranged to change the configuration or to include additional modules and accessories as necessary.

.2 Clinical systems furniture requires a quantity of electrical power and data service connections that may not be supported by the furniture chases. Provide additional service walls where required.

Participants will provide and install clinical systems furniture with user adjustable height features for the following:

nursing workstations;

charting alcoves;

c) triage desk;

unit clerk stations;

e) team care stations;

registration cubicles; and

patient wardrobes including shelving, drawers, coat rods, counters, and cabinets.

.4 The Participants will provide all accessories, storage, cabinetry, upper and lower shelving, keyboard trays and counters necessary to facilitate efficient clinical operations.

6.13.5 Systems furniture

Systems Furniture means a composition of factory-produced wall mounted or partition components that are easily reconfigurable, height adjustable, and interchangeable. Systems furniture is Designed for office or commercial use and includes accessories and attachments which complete its functionality.

Systems furniture requires electrical power and IMIT and data service connections.

Participants will provide and install systems furniture with user adjustable height features for the following:

office workstations;

system furniture cubicle partitions; and

work/study carrels.

.4 The Participants will provide all accessories, storage, cabinetry, upper and lower shelving, keyboard trays and counters necessary to facilitate efficient clinical operations.

6.13.6 Furniture

Furniture means loose or unattached items that can be rearranged to suit various activities. It is provided by the Owner and installed by the Participants. It includes:

coffee tables and side tables;

unattached seating (such as chairs and stools);

waiting room seating;

sofas and lounge chairs; and

office desks.

.2 All furniture and millwork supplied by the Owner or Participants will meet the following requirements:

Flexibility

Products must offer modular solutions that will enable flexibility and LEAN principles to be practiced. Furniture pieces should:

- allow for individualization;
- possess the ability to be used in different applications or flex easily for future use;
- use non-handed solutions that work in multiple configurations, when possible.

Durability

Activity, waiting, and dining room furniture will be engineered for high traffic use.

Patient room furniture will be Designed for acute care healthcare use and be tested to ensure durability and function.

Furniture will conform to Upholstery Section 6.13.6.3.e) Cleaning and Ease of Maintenance for additional criteria related to durability.

c) Construction

The quality and make of the product (its Construction, finish materials, and maintenance requirements) will be suitable for long term use and be Designed for intense performance.

Products with replaceable components are preferred.

Wood furniture should be avoided, particularly in clinical areas (such as patient rooms, waiting rooms, unit offices, nurses' stations, staff rooms and conference rooms). Where utilized, wood pieces should be constructed of:

- Solid wood frames of kiln dried wood for added strength and long-term durability.
- A frame capable of supporting varying weights and body types and offering ease and reassurance to both patients and care providers.
- Plastic laminates can be used in place of real wood when a wood-look is desired.

.3 All furniture and furnishings supplied by the Owner or Participants will meet the following requirements:

Seating

In waiting room and patient seating, steel tube Construction and spring-seat Construction are preferred.

Seating with wall-saver legs or a wall-saver back Design is preferred.

Seating products with arms should include polyurethane arm caps rather than upholstered arm caps.

Refer to upholstered notes referenced throughout this document for information on upholstered seating products.

Tables

For durability in waiting rooms and high traffic areas, horizontal table surfaces of solid surface material tops or plastic laminate are preferred.

Low VOC polyurethane sealed woods can be used on vertical surfaces if plastic laminate is not available.

Edges will feature an ergonomic profile for user comfort and be of durable material composition and Construction.

Workstations/Desks

Refer to individual specifications for material composition and finish information.

When installed, two adjoining end panels of work surfaces will be leveled so work surfaces sit at the same height.

Tack board, if specified with desk and/or workstation, between hutch and worktop, will span from work surface top to underside of overhead cabinetry leaving no visible gaps, while, at the same time, managing task light wires, if specified with assembly.

Front edge of keyboard platform will be set back from front edge of work surface and/or table.

Any "smart" or "hardwired" furniture will be fully coordinated for proper circuitry and any other Building requirements.

Filing / Storage

i) Filing is for letter filing, unless specified otherwise. In order to maximize filing capacity, files will be set up for side-to-side filing.

During installation, the conversion parts of the files will be left in the file to allow for front-to-back / side-to-side conversion at a later time.

Filing will be equipped with hanging frames at the time of installation.

At a minimum, two-drawer files will include a counter- balance package as recommended by the product manufacturer.

Lockable storage will be keyed as per the Building keying system. Keying schedule to be determined with the Owner.

Cleaning and Ease of Maintenance

i) The size, shape, and Design of the furniture will allow easy access for cleaning.

Materials, upholstery, and finishes will be capable of withstanding

institutional grade detergents, cleaners, and disinfectants with no effect on the appearance, integrity, or life of the product.

Selection should be based on the understanding of the principles of decontamination and maintenance requirements (able to withstand multiple applications of disinfectants over time).

The Participants will request that manufacturers provide detailed cleaning and disinfection guidelines prior to the Participants purchase along with a thorough listing of which cleaning products can be used on their products. The Participants will review instructions to ensure they are clear and cleanable with the Owner's approved detergents and disinfectants.

6.13.7 Upholstered Soft Furnishings

Upholstered soft furnishings will have the following characteristics:

Be seamless where possible or have double stitched seams located on the non-contact areas of the furniture or sealed.

Limited pleating.

c) Upholstered furniture in care areas will be covered with fabrics that are fluid-resistant, non-porous and can withstand cleaning with hospital grade disinfectants.

d) Seating will have removable seat cushions for cleanability and/or "clean-out" spaces between the seat and back for lounge seating applications.

Seating will have removable upholstery covers for both the seat and back, if applicable. Attic stock of the removable upholstery covers will be ordered with the original purchase, in the amount of 5% of the total waiting room and patient room seating.

f) Have high-destiny foam cores with a moisture barrier and resistance to mold; and

g) Upholstery will:

be impermeable to water and quick-drying;

be anti-microbial, and/or have anti-microbial inhibitor technology;

have a good abrasion rating for high-use areas (with a minimum of 100,000 DR (ASTM D4157-Wyzenbeek Test Method);

iv) have a high-rating for color-fastness, exceeding 40 hours (AATCC Method 16A);

be stain-resistant;

be latex-free;

have low volatile organic compounds;

contain no heavy metals;

have no halogenated flame-retardant materials or perfluorinated chemicals; and

have limited use of polyvinyl chloride, avoiding use of polyvinyl chloride where possible.

6.13.8 Infection Prevention and Control

Organic finish substances (e.g. wood), which can be exposed to a liquid, and upholstered furnishings, will be avoided in all clinical areas patients are seen.

.2 The use of impermeable upholstery (such as vinyl) is recommended in high-risk areas (high-risk applies to any areas specifically used by patients/residents/clients, including patient rooms and waiting rooms) and any area where a healthcare worker goes after providing direct patient care (including Team Care Station, staff lounge, report area, conference rooms and office within patient care areas). Polyurethane fabrics are preferred, if they meet the requirements of the application.

Durable, fluid resistant, able to be cleaned and disinfected fabrics are appropriate in low risk areas. A low level of risk applies to any office areas where staff members are not providing direct patient care or return to after providing direct patient care.

.4 Environmentally Sensitive products will be GREENGUARD certified and be Designed to achieve reduced environment impact.

.5 If wood products are used, lumber should come from responsibly managed forests, with each piece utilized to its full capacity. Wood should have low formaldehyde emissions with little to no CFC's used in the production of the materials.

6.13.9 Comfort, Ergonomics, and Safety

Waiting room furniture will be Designed to promote comfort and long term durability.

The product Construction and Design should avoid stress and fatigue to the patient.

.3 Seating will have the stability to assist the patient or visitor in entering and exiting the chair.

.4 All items of furniture (including tables) will be stable and will not move or tip over when touched by a person requiring support.

Furniture will not constitute a hazard for persons who have visual limitations and will be usable by persons with varying abilities and disabilities.

Products will accommodate and facilitate comfort and well- being.

.7 Selected products will maintain staff safety during cleaning and maintenance.

Back support will be provided on seating pieces, through the use of a high or mid back, to provide adequate back support to various populations.

.9 A minimum of 20% of seating will be Designed to meet Bariatric requirements of 454 kg (1000 lbs).

.10 Task seating will be ergonomically correct with respect to the seat height and pan depth. Seating will be height adjustable, with height adjustable lumbar support to maintain correct body alignment, adjustable back rest tilt, adjustable seat pan depth, height, width, and swivel adjustable armrests. The seat pan will have a waterfall edge on the seat pan or a radius front seat cushion to avoid restriction of circulation to the lower legs. The overall dimensions will be appropriate for the majority of users.

.11 General meeting room seating will have a backrest recline function, be stackable, mobile, cleanable and durable.

Boardroom seating will be height adjustable, feature a backrest recline function, be stackable, mobile, cleanable and durable.

.13 Waiting room seating will include armrests to aid sitting and standing and have a raised seat pan for hip and knee considerations.

.14 All Psychiatric areas will contain furniture that is not intrinsically harmful or will not allow patients to injure themselves or others. Security and safety for patients and staff are the main criteria for evaluation of furniture choices.

6.13.10 Built In Workstation

Single-user or Multi-user built in workstations for computer, reading, and writing:

Allow leg clearance and movement under the work surface and keyboard to be placed at elbow height for most users (27- 1/4 inches, 692mm).

Depth: Allow room for keyboard, document holder between the keyboard and monitor and monitor positioned for comfortable viewing (29 inches, 736 mm). Additional depth may be required depending on the tasks completed at the workstation.

Width: Accommodate keyboard and mouse, telephone, writing and reading areas (min. 27.6 inches, 700mm). Additional width depending on tasks completed at the workstation.

The Participants will be responsible for verifying field measurements to ensure proper clearance for fitting items per the specifications and drawings.

6.13.11 Supplemental Standards and/or Guidelines

In addition to the above listed features, furnishings will be Designed and specified in accordance with all appropriate Ergonomic Design principles and best Design practices of the Owner. Products should also meet minimum criteria set out in BC Building Code and in accordance with the Occupational Health and Safety Regulations and the Ergonomics (MSI) Requirements of WorkSafe B.C.

.2 Design should reference Island Health Ergonomic Standard for Computer Workstations.

The Facility and its components must be accessible by people with different functional capacitates including, children, the elderly, handicapped, and the disabled as defined in the BC Building Code. The Participants will apply "Universal Design" principles in the Design and planning to ensure the furnishings are usable by all people without the need for specialized Design or adaptation. Counters, desks, and work surfaces in non-office areas will include wheelchair access for both patients and the public.

.4 Products, including foam and upholstery, will be fire retardant to meet applicable Building Code requirements.

6.13.12 Furniture List and Specifications

The furniture is described in Attachment 2I- Equipment and Furniture in generic terms. The quantity column demonstrates the number of identical items in a room. All room numbers, room names, and department names are the same or are derivatives of the Appendix 2A Clinical Specifications.

.2 Furniture pieces and layouts should follow the accessibility principles of Appendix 2C Design Guidelines and Section 3.3.4 Accessible Design.

6.13.13 Laboratory Casework

General Approach

Provide laboratory casework:

for the specific and particular functions to be performed by the

casework;

to give the end users a good working ergonomic environment that is suited to their specific needs; and

with structural rigidity and chemical resistivity to withstand the service conditions for which they are exposed.

All casework will be modular and consistent throughout the Facility.

All casework will be lockable.

Casework will be wood, metal and/or epoxy resin, selected to minimize cleaning and maintenance operations and maximize infection control capabilities. Refer to Appendix 2B Wood First Appropriate Use Matrix regarding use of wood.

All epoxy resin material bench tops will be acid resistant.

Provide all lab benches with cabinets for approximately 50% of the length of the benches.

g) Lab bench systems will hide and organize instrument tubing, electrical and/or data cables.

h) Casework will comply with all applicable Standards, including:

at a minimum, the quality Standards of the Architectural Woodwork Manufacturer's Association of Canada (AWMAC) for Premium Grade; and

ii) the BC Building Code "Building Requirements for Persons with Disabilities".

Use non-toxic, non-solvent adhesive glue complying with AWMAC Quality Standards Manual, and that of Canadian "Eco-Logo" program or equivalent, with a Total Volatile Organic Carbon (TVOC) emissive content of 20 gr/litre.

Provide casework anchorage that complies with the seismic restraint requirements of BC Building Code. Steel for cabinet Construction for laboratory casework will be levelled prime quality furniture grade cold rolled steel.

k) Minimum 20% of sinks in Laboratory casework will be accessible.

.2 Cabinets

a) Parts and sub-assemblies (doors, drawers, tracks and back panels) will be interchangeable in the field without requiring special tools.

Doors and drawers will be interchangeable with like- sized cabinets. Cabinets will be constructed so that a standard height drawer can be removed and two half height drawers installed in its place. Likewise, a cupboard door or doors can be removed and replaced by a like-sized combination of drawers or vice versa. This interchangeability will permit rearrangement in the field of all components in addition to being able to relocate the entire cabinet, should changing needs dictate a revision in the layout of cabinets.

All cabinets are to be enclosed with lockable doors; hardware will be stainless steel.

Provide modesty panels where the back of the benches are exposed.

Wood Laboratory Casework

Cabinetwork and framing system will be constructed of prime grade selected materials to conform to AWMAC Premium Grade; Flush Overlay Cabinet

Construction.

Fabricate cabinets and cases as self-contained modules and in accordance with the best practices of the wood laboratory furniture industry. Finish exterior and interior surfaces to allow for relocation without the need of additional finishing.

Assemble units with concealed fasteners, or glued and screwed Construction, making each unit rigid and self-supporting for use interchangeably in an assembly or for single unit use.

Use epoxy resin counter/bench tops and splash backs, to be provided in minimum two different colours, black in microbiology and different for the remaining use.

Finish exposed wood surfaces with a polymerizing two-component catalytic conversion varnish system specially formulated for chemical reagent resistance. The individual components will be chemically compatible to assure perfect adhesion and a top quality, durable finish.

.4 Stainless Steel Casework

Fabricate from Type 316L, No. 4 finish stainless steel.

Corners will be welded, ground, polished and crevice-free. Joints and welds will be polished to a uniform No. 4 satin finish. No filler or solders will be used. Straight lengths will be one-piece with all seams, including field joints, welded.

c) Sound-deaden tops and reinforce with waterproof plywood core, bonded to tops with waterproof contact cement. Seal underside of top (plywood core) with a waterproof finish. The front edges of the tops will be marine edge. Form splashback as an integral part of the tops, radiused where the splashback occurs in the top. Bond all splashbacks to plywood core, bonded the same as specified for the tops. Fabricate countertops, splashbacks, and front aprons out of one piece of stainless steel. Weld counter and sink assemblies into single units without seams or joints. Drill splashbacks, tops and sinks to receive plumbing and electrical fittings.

Form integral sinks with all-welded rounded corners, seamless Construction with all traces of welding removed. Weld stainless steel sinks integrally into tops without seams or joints. Slope tops for sinks and adjacent drain boards to sinks. Provide sinks with drain outlets with removable stainless steel strainer. Stainless steel bench and or counter tops are required where staining or similar procedures are performed.

Leg Frame Laboratory Casework System

The leg frame system will provide complete independent rigid support for all overhead shelving, undercounter suspended cabinets, service cover panels, countertops, sinks and fittings including all mechanical and electrical line work, as necessary to make the assembly operational.

The concept will permit the addition, relocation or removal of suspended base cabinets, the removal of the entire leg frame module including base cabinet and countertop, leaving intact the separate service strip with all its service fittings, service lines and cover panels as a finished operational component. The countertop height will be Designed to be from desk to counter height adjustable without the addition of framing components.

c) Base framing modules on basic standard cabinet modules.

Steel frame will comprise vertical wall channels and independent self- contained pipe chase and leg sets which will allow for the removal and/or interchange of work surfaces and suspended under-counter mounted cabinets and upper shelving.

Determine pipe chase location in consultation with the Owner.

Fabricate system from prime quality furniture grade cold rolled steel.

Form all components to create a rigid interlocking structure. All services will be fully accessible through removable cover panels, no special assembly tools are required. Bench legs to be fully adjustable. All legs will have Leveler bolt. Suspended cabinets will be interchangeable and easily moved from workstation to workstation. Adjustable leg frame modules will be capable of adjusting countertop heights in 25 mm increments from 750 mm height up to 1100 mm height.

g) Finish for steel surfaces will be as specified above.

Miscellaneous Accessories

a) Laboratory casework will include the following accessory items:

countertops and splashbacks;

service fittings;

drying racks;

pegboards;

acid storage cabinets;

vi) flammable storage cabinets;

glassware drying cabinets;

framed sliding glass doors;

sliding glass doors;

x) open storage units;

emergency eye wash;

emergency shower head;

xiii) safety shower station;

xiv) bin cabinets;

xv) file drawer cabinets; and

xvi) mobile cabinets.

6.13.14 Window Coverings

Provide window coverings as follows:

all exterior windows are to receive shading devices providing privacy, sun and heat control, that are easy to clean and do not support or provide a surface that encourages spread of infectious disease (i.e. do not become electrostatically charged);

roller shades are preferred for use on exterior windows.

c) all interior windows to receive blinds where privacy may be a concern; and

in all inpatient rooms, including General Medical/Surgical Units, Perinatal and Paediatric Unit, Psychiatry Inpatient Unit and ICU/HAU provide window coverings that prevent visibility into the patient bedrooms at night from the exterior.

any other locations identified in Appendix 2A Clinical Specifications.

.2 Provide integral blinds in Psychiatry Inpatient Bedrooms and Seclusion rooms, and pediatric psychiatry rooms, on the exterior, as appropriate for the level of privacy and in accordance with Appendix 2A Clinical Specifications.

Blinds should be selected to provide optimum privacy, sun and heat control, are easy to clean, are not prone to become electrostatically charged and their surface does not encourage the spread of infectious disease.

.4 Window coverings will allow control of exterior light entering the room during daylight hours and provide privacy during daylight and non-daylight hours.

Provide motorized black-out window coverings or other suitable strategies in the Operating Rooms, Procedure Rooms and in exterior an interior locations and in any other location identified in Appendix 2A Clinical Specifications required for laser precautions.

.6 Where window coverings are required for black-out functions, provide materials, tracks, seals, and operation suited to that purpose.

.7 Use window coverings manufactured from materials and mechanisms that minimize cleaning and maintenance operations and maximize infection prevention and control.

Unicell horizontal venetian blinds are also discouraged other than for between-glass installation. Roller shades and vertical blinds are preferable.

6.13.15 Window Shade Systems

.1 Use manual roller shades with one piece extruded aluminum roller tube, extruded vinyl fabric spline, aluminum profile hem bars.

.2 Install recessed in ceiling pockets, facilitating easy removal and replacement. Use galvanized or zinc-plated steel mounting brackets and non-corrosive fasteners.

Use shading fabric of non PVC coated fibreglass yarn and that:

is waterproof, washable, rot-proof, flame-resistant, fungal and bacteria- resistant, colourfast to light, glare-reducing, and able to control heat gain and provide external visibility;

conforms to CAN/CBSB-4.162-M, "Hospital Textiles - Flammability Performance Requirements"; and

c) is tested in accordance with ASHRAE Standard 74073 for shading coefficient, fungal resistance in accordance with ASTM G21, and bacterial resistance.

.4 Audiovisual Light Blocking Shades: Fabricated from black-out shade panel material, Designed to eliminate all visible light gaps when shades are fully closed.

Manual shade operation with continuous loop bead chain, clutch, cord tensioner and bracket lift operator.

.6 Not Used.

6.13.16 Venetian-Type Blinds between Interior Glazing

Provide integral blinds or polychromatic glass, with controls on both sides, in interior glazing windows and doors in the following rooms:

ICU/HAU doors and in between adjacent ICU patient rooms;

Psychiatry Inpatient rooms and PES seclusion rooms in the Emergency Department in viewing window from corridor;

Airborne Isolation Rooms: viewing window from corridor or Team Care Station outside;

viewing windows between Ante Room into the Airborne Isolation Patient Rooms;

Emergency Department Ante Room into the Decontamination Room; and

Treatment room doors throughout the Building.

.2 Provide slide operators for integrated blinds; crank operators are not acceptable.

.3 In special areas such as the Psychiatry department, construct windows with blinds suited to the purposes unique to those areas and in accordance with the British Columbia Ministry of Health Standards for Hospital- Based Psychiatric Emergency Services: Observation Units.

.4 Provide black-out capable blinds for viewing windows between the scrub sinks and Operating Rooms for Ophthalmic Surgery.

Not used.

.6 Use a hardware/window Design that does not allow air movement from a room to adjacent rooms. Openings in the glazing plane are not allowed.

.7 The operator will be a specially constructed, permanent magnet capable of moving the blind assembly from a closed position in one direction to a closed position in the opposite direction.

6.13.17 Exterior Architectural Louvre System

Provide exterior aluminum louvres and vents as follows:

Provide systems finished with Class 1 Anodic Finish or 70% PVDF coating systems described in:

American Architectural Manufacturers Association (AAMA) 2605 Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; and

American Architectural Manufacturers Association (AAMA) 611 Voluntary Specification for Anodized Architectural Aluminum;

b) Provide motors and related components for motor operated adjustable louvres that are listed and labelled by CAN/CSA C22.1 and that comply with the National Electrical Manufacturers Association Standards for exposure classification;

Follow the recommendations of the National Association of Architectural Metal Manufacturers (NAAMM) for applying and Designating finishes;

Allow for movement of components without causing buckling, failure of joint seals, undue stress on fasteners when subject to seasonal temperature range:

Winter minimum: ambient -20°C, surface -15°C;

Summer maximum: ambient +40°C, surface +55°C; and

Temperature range: ambient 60°C, surface 70°C difference.

Have air performance, water penetration, air leakage, and wind driven rain ratings in accordance with performance requirements listed and as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width in accordance with AMCA 500 L Laboratory Methods of Testing Louvers for Rating; and

Provide systems from a single manufacturer for a given Building Structure

6.13.18 Exterior Architectural Shading System

Provide exterior architectural shading systems where required to reduce heat gain and direct sunlight penetration.

Provide shading systems that are Designed for the requirements of each Building face that is exposed to sunlight but together provide a comprehensive and integrated Designed solution.

6.14 Special Construction (Division 13)

6.14.1 Radiation Reference Standards

Comply with the following references from the American Society for Testing and Materials (ASTM):

ASTM A653/A653M-17, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process;

ASTM B29-14, Standard Specification for Refined Lead;

ASTM B749-14, Specification for Lead and Lead Alloy Strip, Sheet and Plate Products; and

ASTM C1396/C1396M-17, Standard Specification for Gypsum Board.

Comply with the following references from the National Council on Radiation Protection and Measurement (NCRP&M):

Report #147 Structural Shielding Design for Medical X-Ray Imaging Facilities;

NCRP #151 " Structural Shielding Design and Evaluation for Megavoltage X and Gamma-Ray Radiotherapy Facilities;" and

c) 1.5.2.3 NCRP #49, #33, #35, "Structural Shielding Design and Evaluation for medical use of X-rays and Gamma Rays".

For lead-lined gypsum board, comply with ASTM C36 or and ASTM C1396/1396M, Type X.

.4 For lead glass, meet or exceed Federal Specification DD-G-451.

For cassette transfer cabinets, meet or exceed MIL-C-3673 (DM) Radiation shielded.

.6 For radiation shielded doors, meet or exceed American National Standards Institute/ National Woodworkers Manufacturers Association (ANSI/NWMA) Industry Standard for wood doors and NCRP Report #49.

6.14.2 Radiation Protection

Comply with all applicable requirements of the Canadian Nuclear Safety Commission, Health Canada Safety Code for Radiation Exposure and Radiation Protection Service, B.C, Centre for Disease Control, Government of B.C., 655 – 12 Ave West, Vancouver, B.C. V5Z 4R4.

Provide radiation physicist report and review of plans and all assembly Constructions (floor, wall and ceiling) including windows and doors at Design and at installation of radiation protection. Physicist to identify any exposed hazardous areas above, below and beside the radiation emitting equipment that may be occupied and the radiation protection required.

Provide radiation protection in walls, doors, and windows as required and appropriate to protect staff and patients from X-ray Imaging, Fluoroscopy, Computed Tomography (CT) Nuclear Medicine, radioactive storage decay and other rooms where radiation detection is required.

.4 Provide radiation protection by incorporating lead sheet of appropriate weight and thickness into wall assemblies, doors, door frames, door hardware, windows and window frames.

.5 Radiation shielding will be 9.75 kq/m2, not less than 0.9 mm lead to 2.1 m above the floor level as a minimum. Update lead weights based upon reference standards as there are multiple thicknesses for shielding needs. Shielding thickness and locations will be determined by the medical physicist who evaluates the exam rooms based upon modality, exam type, exam duration, through put and occupancy of adjacent spaces.

.6 Fabricate radiation-shielded doors using a single layer of sheet lead with wood core laminated on each side of the lead. Bond cores using poured lead dowels at edges. Provide Pneumatic locking system.

.7 Fabricate radiation-shielded door and window frames with lead-lining.

Leaded glass occurring in radiation shielded doors or windows will provide equivalent protection to the wall in which they occur.

For lead-laminated gypsum wallboard, use a single unpierced sheet of lead.

.10 For sheet lead applied directly to partition steel studs, provide a continuous and complete protective shield.

.11 Provide radiation shielding barriers, mobile or fixed, modular and transparent barriers to protect medical personnel by providing a full body shield. Provide units with distortion- free, lead-plastic windows.

6.14.3 Electromagnetic Interference Shielding (EMI)

Comply with all applicable requirements for Magnetic Resonance Imaging (MRI) exam room shielding per manufacturer's specifications.

Provide quench venting per equipment vendor specifications.

Provide slab recess to accommodate EMI shielding and give a level finish floor transition from the MRI exam room to the adjacent space.

6.14.4 Cooler and Freezer Rooms

Provide walk-in cooler and freezer rooms, with freezer room floors recessed into the slab for "flush" walk-in.

Design room enclosure elements to accommodate movement in wall and structural movements without permanent distortion, damage to infills, racking of joints, breakage of seals, water penetration or glass breakage.

.3 Design temperatures for cooler and freezer rooms will be as follows:

for cooler rooms: + 2 degrees C to + 10 degrees C;

for freezer rooms: -10 degrees C to -25 degrees C, with normal operation at -20 degrees C +/- 0.5 degrees C;

.4 Design floor, wall and ceiling panels to comply with ULC/ORD-C376 "Fire Growth of Foamed Plastic Insulated Building Panels in a Full-Scale Room Configuration".

Design floor, wall and ceiling panels with tongue and groove joints to achieve a maximum air leakage rate of 0.03 L/s/m^2 at a static air pressure difference of 75 Pa and a water vapour permeance rate of 0.00 perms in accordance with ASTM E283 "Air Leakage Rate Testing" and ASTM E96" Water Vapour Permeance Rate Testing".

Design ceiling panels with internal reinforcing to provide a maximum deflection of 1/240 of span under uniform loading of 20 psf and to support refrigeration systems.

.7 Design room assembly to permit replacement of components.

Allow for ceiling, piping, conduit and other interior dead loads imposed on the structure.

.9 Provide components and accessories as follows:

a) Floor, Wall and Ceiling Panels: fabricated from commercial grade galvanized steel conforming to ASTM A526M with zinc coating to ASTM A525M, Designation Z275, and finished on exposed surfaces with manufacturer's standard baked white enamel.

Panel Insulation: foamed-in-place polyurethane.

Doors: 915 mm x 2115 mm of same panel Construction as panels, with soft perimeter gaskets, manufacturer's standard pre-wired light switch, dial thermometer, heavy duty door closer, spring loaded and self-closing hinges, latch, pull handles, kick-plate and threshold plate. Furnish freezer doors with anti-condensate heater, heated vent and pre-wired sill.

Provide self-supporting steel shelving racks in cooler rooms.

Refrigeration System: self-contained air cooled condensing units mounted on walk-in units and forced-air evaporators mounted on interior of units. Capacities, air delivery and dimensions to manufacturer's Design. The cooling units are to consist of minimum two separate units per room to provide full cooling capacity redundancy for servicing and maintenance. Top mounted units are to be fully accessible for maintenance and be able to be removed independently for replacement without affecting the secondary unit.

Lighting: CSA approved vapour proof box with standard incandescent light fixture pre-wired to switch on door frame.

g) Alarms: Modulam MT, 1 local and remote to the BMS for each room.

6.15 Conveying Equipment (Division 14)

6.15.1 Elevators – General

The requirements set out in a prescriptive manner herein will be considered minimum requirements.

Elevator commissioning shall adhere to the commissioning plan requirements as noted herein.

.3 Participants will retain a vertical transportation consultant that is a professional engineering firm specializing in vertical transportation. The vertical transportation consultant will provide vertical transportation study and analysis of the Facility Design to determine the number, size, and speed of the elevators for proposed plan.

.4 Submit analysis conforming to performance requirements to demonstrate suitable Design for a contemporary hospital Facility of this nature. Submit analysis report to the Participants for review, with report clearly defining all assumptions and basis of

analysis. Refer to Elevator Indicative Report in the data room as the baseline for assessment of additional requirements.

Elevator service in a hospital is evaluated based on demands placed on the system during a typical, five-minute, heavy, two-way traffic period, (i.e., considerable traffic is being handled in both the UP and DOWN directions), with passenger and vehicles entering and exiting the cars at various floors throughout the elevator round trip.

.6 Elevator analysis, to provide service excellence in health care facilities, is predicated on the Projected number of patients, staff counts in the Facility and the Projected vehicle traffic.

.7 Handling Capacity:

The public passenger elevators will be capable of providing vertical transportation of the entire public population plus 25% of the staff population;

b) Public passenger elevators will have a handling capacity of at least 12% of the public and staff population utilizing these elevators, for a peak 5-minute period;

Patient transfer/staff service elevators will have a handling capacity of at least 4% of total number of beds and 12% of total staff and patient population utilizing these elevators for a peak 5-minute period; and

Handling capacity refers to the number of passengers that are transported by the elevator for a prescribed peak 5-minute period.

Interval

Traffic interval analyses based on average waiting time calculations will be used for the public and service elevators; the average waiting time for adequate elevator service will be between 30 and 50 seconds;

b) Traffic interval analyses will be based on average wait times.

Load factor: Passenger elevators will provide adequate service with a load factor below 40%. Patient transfer/staff service elevators will provide adequate service with a load factor below 40% or a minimum of one (1) Bariatric bed inclusive of four staff. Load factor refers to the number of passengers transported by each elevator during one trip expressed as a percentage of the maximum number of passengers permitted by CSA B44 – Safety Code for Elevators and Escalators.

Separation of traffic: provide distinct separation of traffic types, with passenger elevators for public, patient and trauma elevators for inpatient traffic and service elevators for materials and logistic traffic.

Elevator grouping: grouping elevators rather than providing single units or small groupings at various locations gains the best elevator service. In consolidating elevator service, traffic congestion, infant security and walking distance will be considered.

Elevator locations: elevators will be located to provide separation of traffic types as well as minimize walking distances.

.13 Staff/emergency/service elevator cabs: non-public elevators used to transport patients will be able to accommodate a Bariatric bed, up to four staff, four IV pumps, extra corporeal life support equipment, portable ventilator, oxygen tanks and monitors; and have enough space to allow for staff to carry out emergency procedures within the elevator and will be capable of transporting at least 12% of the staff population for a peak 5 minute period.

.14 Scope of Work

Provide passenger and service elevators as required to satisfy the equipment and performance specifications as herein described.

Provide groups of elevators for:

Inpatient Tower public and staff passengers;

Inpatient Tower patient Transfers/staff service;

D & T Block public and staff passengers;

D & T Block patient transfer/staff service;

Clean & Soiled MDRD service; and

Service Centre material Lift.

Provide heavy duty equipment engineered and Designed to provide long term reliable operation and performance based on the needs of the Facility.

Provide equipment and perform elevator work in accordance with the requirements of the most recent applicable edition of the following standards and any other Codes or Regulations that are in effect, at the time of award.

CSA/B44 Safety Code for Elevators and Escalators;

CSA/B44 Safety Code for Elevators and Escalators (Appendix E);

Requirements of the Elevating Devices Safety Regulation and the Safety Standards Act of BC;

WorkSafe BC Occupational Health and Safety Regulation;

CSA Z8000 – Canadian Health Care Facilities – Planning, Design and Construction section 12.2.6 – Elevators;

vi) CSA Z317.13 – Infection control during Construction, renovation and maintenance of Healthcare Facilities;

Fire Tests of Door Assemblies, CAN/ULC-S104-10;

Canadian Electrical Code C22.1;

ix) British Columbia Building Code, 2018.

Include all Alliance Works required for registration, testing and licensing of elevators by jurisdictional authorities.

f) Unless otherwise indicated, all stainless steel finishes will be manufacturer's standard ASTM type 304, brushed #4 finish.

Provide wrap-around stainless steel door jamb protection up to the top of the elevator entrance frame for all elevators.

Follow infection prevention requirements and efficient flow, while also addressing movement control requirements.

.15 Quality Assurance

All systems and components must have demonstrated record of reliable performance, in similar applications, for a minimum of five years.

Provide equipment capable of maintaining normal operations with power fluctuations up to 10% of normal supply voltage and machine / controller / hoistway temperatures of 5–35 degrees Celsius.

.16 Trademarks

Manufacture / elevator contractor trademarks or logos will not be visible to the public.

.17 Maintainability

Provide elevator equipment that will not restrict the ability to engage a competent elevator maintenance contractor, other than the original manufacturer / installer, for the provision of maintenance services. Where microprocessor based control systems are supplied, provide "on board" diagnostic tools and associated manuals containing all set-up parameters, code references and troubleshooting instructions required for routine maintenance and adjusting procedures.

Elevator equipment will not include any software, counters, timers, or other devices that will automatically shut down, alter, or otherwise effect normal equipment operation.

.18 Non-proprietary

a) Non-proprietary will refer to all elevator systems and equipment meeting established standards for universal serviceability and maintainability. These standards will include the following elements:

Parts and equipment can be purchased, installed and maintained by any elevator company;

Repairs, upgrades, parts integration, replacement, diagnostic and programming information, tooling at sale or upon request, technical support and training where required to support the products will be readily available for not less than 25 years;

Control systems will include diagnostic tool functions, either onboard or in a separate device provided that such maintenance, adjustment and troubleshooting device or system provides unrestricted access to all parameters, levels of adjustment, and provides alerts for necessary maintenance of the equipment;

A proprietary tool will not be required for any reason. Any lost or damaged tool must be promptly replaced or repaired at reasonable market cost;

Manuals, engineering drawings, circuit diagrams and prints will be provided with the equipment at time of delivery. All documentation will be available for replacement purchase, at reasonable cost, by any installing or maintaining elevator contractor or persons so Designated by the Owner;

vi) Software or software keys will not expire;

Software operation will not degrade, and all service updates to the original software will be provided by the control manufacturer free of charge to the Owner for not less than 25 years; and

The control manufacturer will provide direct support and diagnostic information to the Owner and their Designated maintenance company. Factory and/or on-Site training regarding installation, adjustment, maintenance and troubleshooting of the equipment will be available from the original equipment manufacturer for not less than 25 years. Training fees will be reasonable and appropriate to the market.

Include a standard two (2) years parts and labour warranty of the elevator equipment from the date of Substantial Completion. Refer to the Owner's Elevator Maintenance – Services Agreement.

Elevators will be Designed to ensure maintenance can be carried out only on floors that do not contain Clinical Spaces.

6.15.2 Elevators – Products

Inpatient Tower Public Passenger Elevators

Provide, as a minimum, a group of three (3) overhead traction type passenger elevators servicing levels required by the Facility.

Elevators will have rated capacity of 1820 kg (4000 lb), minimum rated speed of 1.78 mps (350 fpm).

c) Provide entrances at each floor served, with 1220 mm (48") wide x 2438mm (7'-0") high clear horizontal sliding, centre-opening doors and finished in stainless steel.

Provide cab configuration to accommodate front openings only. Configurations using both front and rear openings can be confusing to the public and will be avoided. Car enclosure will have nominal clear inside dimensions of 2340 mm (7'-8") wide, 1650 mm (5'-5") deep and a minimum overall height of 2745 mm (9'-0"), with 2590 mm (8'-6") to underside of suspended ceiling.

Provide car enclosure with stainless steel fronts, two (2) car operating panels and durable finishes.

f) Configure elevators as conventional overhead traction machine type. Locate the machine room directly above the elevator hoistway. Machine room-less type elevators are not acceptable. In addition to the entry/exit door for the machine room, a utility access opening with two side by side fire rated doors will be included into the machine room Design to facilitate the removal of machines and other machine room equipment from the Facility. Minimum size for such openings will be 1830 mm (72") wide x 2032 mm (80") high.

.2 Inpatient Tower Patient Transfer/Staff Service Elevators

Provide a group of three (3) overhead traction type service elevators serving levels required by the Facility. Two (2) of the elevators will serve the mechanical level and the Heliport.

b) Elevators will have rated capacity of 3640 kg (8000 lb.), rated speed of 1.78 mps (350 fpm). Elevators will be engineered to accommodate Class C3 concentrated loads equivalent to the rated capacity with nickel silver sills.

c) Provide entrances at each floor served with 1830 mm (72") wide x 2438 mm (8'-0") high horizontal sliding, two speed, centre-opening doors and finished in stainless steel.

Provide car enclosure with minimum nominal clear inside (finished panel to panel) dimensions of 2134 mm (7'-0") wide, 3050 mm (10'-0") deep, minimum overall height of 3050 mm (10'-0"), with 2896 mm (9'-6") to underside of suspended ceiling or lighting coves.

Provide car enclosure with stainless steel fronts, a minimum of two (2) car operating panels and durable finishes appropriate to the Facility. Provide nominal 100 mm wide stainless steel hand rail and 155 wide stainless-steel bumper rail, bar type, with turned back ends.

Configure elevators as conventional overhead traction machine type. Locate the machine room directly above the elevator hoistway. Machine room-less type elevators are not acceptable. In addition to the entry/exit door for the machine

room, a utility access opening with two side by side fire rated doors will be included into the machine room Design to facilitate the removal of machines and other machine room equipment from the Facility. Minimum size for such openings will be 1830 mm (72") wide x 2032 mm (80") high.

.4 D & T Block Patient Transfer/Staff Service Elevators

Provide a group of three (3) overhead traction type service elevators serving all floors required by the Facility.

Elevators will have rated capacity of 3640 kg (8000 lb.), rated speed of 1.0 mps (200 fpm). Elevators will be engineered to accommodate Class C3 concentrated loads equivalent to the rated capacity with nickel silver sills.

c) Provide entrances at each floor served with 1830 mm (72") wide x 2135 mm (8'-0") high horizontal sliding, two speed, centre-opening doors and finished in stainless steel.

Provide car enclosure with minimum nominal clear inside (finished panel to panel) dimensions of 2134 mm (7'-0") wide, 3050 mm (10'-0") deep, minimum overall height of 3050 mm (10'-0"), with 2896 mm (9'-6") to underside of suspended ceiling or lighting coves.

Provide car enclosure with stainless steel fronts, a minimum of two (2) car operating panels and durable finishes appropriate to the Facility. Provide nominal 100 mm wide stainless steel hand rail and 155 mm wide stainless-steel bumper rail, bar type, with turned back ends.

Configure elevators as conventional overhead traction machine type. Locate the machine room directly above the elevator hoistway. Machine room-less type elevators are not acceptable. In addition to the entry/exit door for the machine room, a Utility access opening with two side by side fire rated doors will be included into the machine room Design to facilitate the removal of machines and other machine room equipment from the Facility. Minimum size for such openings will be 1830 mm (72") wide x 2032 mm (80") high.

Clean and Soiled MDRD Elevators

Provide, as a minimum, two (2) dedicated MDRD hydraulic type elevators at the speed specified herein. The Owner will review and approve front and rear openings based on the Participants' Design.

The MDRD elevator groups will be configured to function as simplex groups. The MDRD elevators will be configured to arrive at Designated floors, hold doors open until cart is removed and the car call is registered.

The Clean and Soiled elevator groups will be in completely isolated hoistways from each other and any other elevators, and not share any common space.

d) Clean and Soiled MDRD elevators will be dedicated and serve all levels required by the Facility. Front and rear openings may be permitted for these elevators as determined with the Owner.

Clean and Soiled MDRD elevators will have rated capacity of 2045 kg (4500 lb.) and a minimum rated speed of 0.76 mps (150 fpm).

f) Car enclosure will have minimum nominal clear inside dimensions of 1730 mm (5'-8") wide, 2440 mm (8'-0") deep and a minimum overall height of 2745 mm (9'-0"), with 2590 mm (8'-6") clear to underside of ceiling. The cabs will be provided with flat handrails and bumper rails.

Provide entrances at each floor served with 1220 mm (4'-0") wide x 2135 mm (7'-0") high heavy-duty, horizontally-sliding, two-speed side-opening doors and finished in stainless steel.

h) Provide each car enclosure with stainless steel finish on the access wall elevations. Elevators with a single opening are to be provided with one (1) car operating panel while elevators with front and rear openings are to be provided with two (2) car operating panels. Provide 100 mm high stainless steel hand rail and 155 mm high stainless steel foot / bumper rail, flat type, with turned back ends.

i) Provide visual and audible indicator to notify Staff that the elevator car has arrived.

j) Provide door hold button operation and increased dwell times to allow for loading of carts.

.6 Service Centre Material Lift

a) As a minimum, provide one (1) dedicated Service Centre hydraulic type B material lift at the speed specified herein. The Participants will review and approve front and rear openings based on the Participants' Design.

b) The Service Centre Material Lift will be dedicated and serve all levels required by the Facility. Front and rear openings may be permitted for this elevator as determined by the Owner.

The elevator will have rated capacity of 1363 kg (3000 lb.) and a minimum rated speed of 0.15 mps (30 fpm).

Class C3 loading shall be provided.

e) Car enclosure will have minimum nominal clear inside dimensions of 1524 mm (5'-0") wide, 2743mm (9'-0") deep, and a cab height of 2134 mm (7'-0"). The cab will be provided with flat handrails and bumper rails.

Provide entrances at each floor served with two section 1524 mm (5'-0") wide x 2135 mm (7'-0") high heavy-duty, hallow metal swing doors, finished in stainless steel.

g) Provide each car enclosure with stainless steel finish on the access wall elevations.

Provide one (1) car operating panel. Provide a 100 mm high stainless steel hand rail and 155 mm high stainless steel foot / bumper rail, flat type, with turned back ends.

Traction Elevator Equipment

All equipment supplied will include a Design and supply life of a minimum of 25 years.

Gearless traction equipment shall be provided. Geared traction machines are not acceptable.

Provide sound and vibration isolation pads such that there is no direct contact between the machine and the Facility structure.

d) Elevator machinery and switchgear will be adequately isolated from the Facility structure to prevent noise intrusion into occupied spaces that are not directly serviced by the elevators, i.e., all occupied spaces with the exception of elevator lobbies. Elevator noise in occupied spaces must be at least 10 dB less than the background noise levels.

Provide an emergency brake to stop the elevator if it over-speeds or if unintended motion is detected in accordance with CSA B44 code.

f) Provide a fully regenerative solid state AC motor drive complete with isolation transformers and filters to meet IEEE Standard 519-1992 for Special Applications.

Provide digital encoders to provide closed loop feedback to the controller on car speed and position.

All major components, including controllers, door operators, drives and machines will be non-proprietary to allow for comprehensive maintenance, diagnostics and on-Site programming without the use of special tools or proprietary software.

i) Provide a microprocessor-based controller consisting of relays, contactors, switches, capacitors, resistors, fuses, circuit breakers, overload relays, power supplies, circuit boards, static drive units, wiring terminal strips, and related components all enclosed in a cabinet with hinged door panels.

j) Equipment will be rated for high usage, based on 240 starts per hour.

Including for guarding of equipment consistent with requirements of CSA B44 and local standards and regulations.

Hydraulic Elevator Equipment

All equipment supplied will include a Design and supply life of a minimum of 25 years.

Provide sound and vibration isolation pads such that there is no direct contact between the power unit and the structure of the Facility.

All major components, including controllers, door operators, valves and pumps will be non-proprietary to allow for comprehensive maintenance, diagnostics and on-Site programming without the use of special tools or proprietary software.

Provide a microprocessor-based controller consisting of relays, contactors, switches, capacitors, resistors, fuses, circuit breakers, overload relays, power supplies, circuit boards, wiring terminal strips, and related components all enclosed in a cabinet with hinged door panels.

For hydraulic elevators not equipped with safeties, a pipe rupture down overspeed pit valve will be provided at the input to the cylinder(s), to stop the elevator in the event of an overspeed condition caused by a broken supply line or an abnormally

high rate of flow from cylinder to tank.

Provide heat exchangers as follows:

The heat exchanger will be sized to accommodate constant use of the elevator while maintaining a maximum oil temperature of 40 degrees Celsius;

The heat exchanger will include a temperature-controlled pump and fan; and

The heat exchanger will be mounted outside of the machine room, unless Site constraints require installation in the machine room.

.9 Hoistway Equipment

Provide entrances consisting of heavy-duty commercial-grade doors, frames, sills, sight guards, door hangers, tracks, interlocks, door closers, gibs, and all other equipment required for a complete installation. Provide entrance doors and frames finished in brushed stainless steel.

Provide standard 'T'-section steel guide rails for the car and counterweight. Install guide rails using brackets fastened to the Facility structure. Clamp the guide rails to the bracket with clips arranged to prevent any horizontal movement of the rail. Join the rail sections using steel backing plates.

For traction-type elevators, provide hoist ropes/belts of sufficient size and number to lift the load and ensure proper wearing qualities. Provide steel ropes consisting of at least six strands wound around a hemp core centre. Ensure that all the ropes for a particular elevator are from the same manufacturing run.

For traction-type elevators, provide a counterweight to counterbalance the elevator for smooth and economical operation with cast iron or steel plate weights contained in a structural steel frame. Provide a counterweight equal to the weight of the elevator car plus between 45 and 50 percent of the rated capacity.

e) For hydraulic type elevators, provide jack and cylinder as follows:

Hole-less single-stage and two-stage telescopic hydraulic elevators are acceptable. Holed hydraulic elevators and roped hydraulic elevators are not acceptable;

Supply will include a complete twin jack unit consisting of cylinders, pistons, piston stop rings, guide bearings and packing, all Designed to suit the service, the speed, and the rated capacity;

Means will be provided to automatically maintain the synchronization between the twin jacks (e.g. lower elevators to bottom landing and synchronize jacks, once daily);

The Participants will coordinate with the elevator contractor to assume responsibility for all hydraulic equipment, including the cylinders, under the terms of both the guaranteed and full-service maintenance agreements;

The pistons will be sized to suit the travel without requiring intermediate support;

Supporting machine beams will be included as required; and

Hydraulic jacks will be installed plumb to within 1/32 inch (0.8 mm) over the length of the cylinder casing and will be parallel with the guiderails to within 1/16 inch (1.6 mm) over the length of the fully

extended pistons.

Provide for the car, and counterweight, spring mounted roller guides located at the top and the bottom of the car, and counterweight frame if applicable.

g) Provide fascias from each hall sill to the entrance header below. Include express zones. Extend the fascias into the pit and the overhead. Alternatively provide a CSA B44-certified car door interlock if fascias are not provided.

Provide sound-isolated car platform.

i) Provide a car frame constructed of steel channels and a platform constructed of steel channels with a metal sub-floor. Isolate the frame and platform from one another so that there is no metal-to-metal contact in order to prevent the transmission of noise and vibration. Mount the elevator cab shell on the platform in alignment with the hoistway entrances. Isolate the cab from the car frame and platform.

j) Install the elevator cabs with a running clearance of 3/4" to 1" maximum between the car sill and hall sills to allow for smoother movement of wheeled equipment in and out of the elevators.

k) Details of vibration isolation will show the method of isolation as well as isolation material proposed and will meet the specification prepared by the Participants' Acoustic and Vibration Consultant. It is the elevator contractor's responsibility to obtain the Elevator Vibration Isolation Guidance document and ensure compliance.

l) Paint all elevator pits up to the sill. Paint Clean and Soiled MDRD elevator hoistways in their entirety.

Cab Equipment

Provide a heavy-duty closed-loop door operator to open and close the car and hoistway doors simultaneously.

Provide an infra-red multiple beam door protective device that protects the full width and up to 1830 mm (6') from the floor of the door opening.

c) Provide durable cab finishes which are consistent with other Facility components, or as specified elsewhere. All finishes and cab Design will be reviewed with and accepted by the Owner. Design will limit reveals, ledges, or gaps that are difficult to clean. All surfaces will be able to withstand disinfection chemicals used by housekeeping.

The patient staff/transfer and MDRD elevators will be equipped with a durable rubber flooring surface suitable for health care facilities, including a minimum thickness of 3 mm. Products will be slip-resistant, resilient flooring with anti-microbial properties and installed without joints. Flooring installation will permit the complete flooring to be removed independently of other elevator components.

The public passenger elevators will be equipped with a durable flooring surface suitable for healthcare facilities and approved by the Owner.

For each elevator with centre-opening doors, or elevators with front and rear entrance arrangements, provide two (2) car operating panels. Otherwise, provide one (1) car operating panel per elevator.

g) Include, as part of the car equipment, the following:

Stainless steel car fronts, including doors, return panels, transom panels;

For passenger elevators, provide suspended ceiling, with recessed pot

lighting. Include raised panels with high quality finishes to achieve a high-level aesthetic on all non-access walls. Provide cylindrical type, stainless steel handrails (38 – 50 mm in diameter) that are easily grasped. All public passenger Elevators will have ligature resistant and tamper resistant finishes, including handrails;

For all staff/emergency service elevators, provide indirect cove lighting. Include raised panels with 5WL textured stainless steel cladding on all non-access walls. Provide flat bar type, stainless steel hand (100 mm) and bumper (155 mm) rails with turned back ends;

For all Clean and Soiled MDRD elevators, provide ceilings and cab interior lighting. Include raised panels with 5WL textured stainless steel cladding on all non-access walls. Provide flat-type 6 mm thick solid stainless steel hand (100 mm) and bumper (155 mm) rails with turned back ends;

Car operating panel(s), including LED illuminating floor buttons with audible call registration tone;

In each car operating panel provide a digital (dot matrix or segmented) car position indicator with a minimum 50 mm (2") high display that will show the current elevator location and direction of travel. Additional display panels are to be provided in the car operating panel, the position indicator will be integrated into the programming of the display panel. Display screen will be capable of displaying emergency messages such as medical emergency, fire recall, wandering patient, out of service, under maintenance as required by the Facility.

Jumbo car operating panel buttons are to be provided for all elevators. The elevator contractor will submit details of these fixtures to the Participants for approval;

Voice synthesizer with automatic verbal announcement of each floor;

Emergency battery-powered lighting;

Variable speed ventilation fan complete with HEPA air filtration system to ensure that air distributed through the elevator cabs has first passed through a filter. Filter will be configured to permit access and replacement from inside the elevator cab by non-elevator personnel, yet not be visible at other times;

xi) Participants will consider evidence informed advanced elevator cleaning devices (e.g. UV Scrubbing technology) to minimize transmission of bacteria and viruses within the elevator cabs.

xii) Firefighters' emergency operation panel;

xiii) Service cabinet and switches;

xiv) Duplex GFCI power outlet located within the service cabinet;

xv) Provision for Wi-Fi access point installation within each elevator cab; and

xvi) Other features required for normal operation.

Do not install any certificates or licences in the cab. Arrange and pay for a variance from the Owner, if required.

Provide one set of cab protective pads for each group of elevators that cover all

walls and the cab front return panel along with pad hooks. Provide pad hooks in all elevators.

Provide heavy duty folding door restrictor.

Elevator must be constructed to accommodate Medical Emergency Operation "MEO" operation.

l) All elevators will be equipped with voice communication system as follows:

Hands-free, one button, two-way voice intercommunication / telephone system with a lobby station and remote handset;

One (1) dedicated phone line must be provided for each elevator cab. Coupling or combination of phone lines is not acceptable;

Provide communication from each car enclosure to Designated CACF in the Facility and to a remote monitoring station;

Elevator phones must have the capability of being programmed to auto-dial to an internal number or outside monitoring station. The phone must attempt to redial appropriate numbers within 15 second intervals if a call is not answered or if a call is dropped without receiving a hang up signal.

Hall Signals and Equipment

Provide hoistway access switches located in the entrance frame or in the hall door sight guard at the top and bottom landing for each elevator regardless of the car speed or floor-to-floor height for safe access to the car top and pit areas.

Provide hoistway doors on all levels with standard landing door unlocking devices.

c) For single car or two (2) car elevator groups, provide one riser of hall station located between adjacent elevators.

Provide in each hall station illuminating up and down oversized push buttons (at terminal floors, provide only one button located with their centreline 1070 mm ± 25 mm (42" ± 1") above the floor

Hall call buttons to be selected from manufacturer top of line or third-party series as determined with the Owner. All car and hall call button illuminations to be LED type with oversized button style and stainless steel finish.

f) For each elevator, provide a digital (dot matrix or segmented) hall position indicator located above the main floor entrances with a minimum 50 mm (2") high display. Position indicators shall indicate at a minimum, MEO, Independent Service, Out of Service, and Fire Recall.

g) Provide hall lanterns with dual stroke electronic tones and adjustable volume control above each main floor entrance and above each entrance at all other levels served. Hall lanterns will be Designed to allow 180 degree viewing of direction indicators.

h) For each group of elevators, provide a properly labelled fire recall key switch and keybox in one hall station at the main floor level. Activation of the key switch will initiate phase one of firefighters' operation.

i) For each group of elevators, provide an emergency power selection switch and LED indicator, labelled "Elevator Emergency Power", in a separate emergency feature hall fixture at the main floor. Indicator will illuminate when elevators are operating on emergency power.

j) For each elevator group, with the exception of the MDRD Elevators and Service

Centre Material Lift, provide one covered hall button at each hall station for "MEO" operation. Pressing the button will initiate stage 1 of "MEO" and illuminate an LED to confirm that demand is registered.

k) For the MDRD elevators, provide each elevator with a remote combination type fixture containing a directional arrow, position indicator and electronic arrival chime (complete with adjustable volume control). Fixture faceplate will be finished in stainless steel and configured as either a surface or flush mounted fixture to suit the mounting location. Display characters for the directional arrow and position indicator will have a minimum height of 60 mm.

For each group of elevators, provide an emergency power selection switch and LED indicator, labelled "Elevator Emergency Power", in a separate emergency feature hall fixture at the main floor. Indicator will illuminate when elevators are operating on emergency power.

Provide elevator control panels within the Facility CACF and provide a lobby panel for the elevators including car position indicators, elevator lobby telephone handset and remote firefighter's emergency operation key switch and indicators, and any other elements required by the specification or governing codes and regulations. For each elevator, provide an electronic indicator to indicate when the elevator is out of service.

n) Designated CACF is located in the Facility.

.12 Electric Wiring

Provide copper wiring to connect the equipment.

Run all wire in metal conduit, duct or electrical metallic tubing.

c) Run travelling cable between car stations and the controller in the machine room, without use of mid-way junction boxes. All travelling cables will be round, as flat travelling cables are not permitted.

In addition to the wiring required for elevator operations, provide special wiring to support installation of two-way voice communication, wireless access points, security card readers, security CCTV camera, video display screen within each car enclosure. If not used at the time of initial installation, label the unused special wires and provide a neat coil of at least five (5) feet of cable within an interface box mounted on side of each controller.

The Participants will coordinate with the elevator contractor to ensure that wireless access points mounted in the elevator cabs will not interfere with the operation of the elevator.

Provide at least ten percent spare of each wire type in each travelling cable.

Provide adjacent each controller a separate junction box or boxes for non-elevator devices such as telephones, cameras, wireless access points, video display screens and security systems.

.13 Accessory Systems

a) Provide a two-way voice communication system and integrate with existing elevator communication systems a hands-free, two-way voice communication system in each elevator, with a central CACF lobby rescue station and remote handset located in Facilities Management Office. One (1) dedicated phone line per elevator car. Provide system that will permit two-way communication between any station location and each car enclosure, remote CACF, Facilities Management Office and control/machine room(s).

Stations inside each machine room will be configured to communicate with master stations, remote stations, other machine room stations and as a minimum with elevators with equipment contained inside the respective room. System features will include a CPC-1 Return to Dial Relay at the lobby phone if not available on the elevator phone to allow the phone to immediately disconnect when the operator hangs up, permitting the cab occupants to place an additional call.

The elevators shall integrate into the Monitoring system located in the Building Services Centre.

.14 Operational Features

For all elevators provide:

Group supervisory, full selective collective operation;

AC VVVF motion control (traction elevators only);

Independent service operation;

Firefighters' emergency operation phase 1 and 2;

Emergency power operation with automatic sequencing; Integration with all Owner IMIT system requirements including the provision of Category 6 cabling to all elevator cabs for accommodation of Wireless Access Points and Video Surveillance cameras;

Integration with IMIT system requirements;

Inspection operation; and

Hoistway access operation.

Provide "MEO" for all elevators with the exception of the MDRD elevators, and Service Centre elevator. Provide stage 1 push button and indicator in hall stations at each floor level and stage 2 push button and indicator in each elevator car operating panel. Push buttons will match the existing MEO buttons at the Facility.

c) For all elevators, provide a personnel card reader in each car operating panel. For patient transfer/staff service elevators and MDRD elevators, the personnel card will be swiped to activate the elevator to go to that floor. For public passenger elevators, no personnel card swipe will be required during normal hours of operation other than to restrict access to mechanical or other non-public levels. After-hours access to any of the floors will require personnel card swipe to activate the elevator.

Provide restricted access to mechanical and heliport levels. Both key and card swipe will be provided.

Key switches will be keyed and colour coded in accordance with requirements of the Owner.

For passenger and service elevators providing access to Clinical Spaces, provide Patient Wandering system operation (lock down elevator when activated) as well as Infant Protection system.

Horizontal threshold gap between car and landing sills will be set between ¾" and 1" to mitigate risk of wheeled equipment from getting stuck between the sills.

.15 Medical Emergency Operation features

Definitions

MEO stage 1 operation occurs when an elevator is recalled directly to

the level requested by staff.

MEO stage 2 operation occurs once stage 1 is complete and MEO has been initiated from inside the elevator, and the elevator travels non-stop to the Designated stop.

MEO will be pre-wired and fully installed on all elevators which require priority access by medical emergency staff. Controller platforms will be configured to permit this feature to be activated.

MEO will be installed to enable medical staff to provide the most rapid care possible in an emergency on as near to all elevators as possible to account for elevator use changing over time.

MEO stage 1 will be initiated by a hall push button and stage 2 will be initiated by an in-car push button in all instances. MEO buttons will have a blue collar, and a blue cover (to be confirmed and provided by the Owner). The push buttons can be supplemented by card reader devices.

MEO Stage 1 will be initiated at all hall entrances.

f) During stage 1, an illuminating indicator and voice synthesizer will indicate that passengers will exit the cab at the floor at which MEO was initiated.

During stage 1 and 2, the hall MEO button shall illuminate and flash to indicate when an elevator has been called for a MEO.

During stage 1 and 2, all position indicators in the car and hall will indicate that the elevator has been called for a MEO.

Remote call locations, including nursing stations, emergency rooms, Heliport landings, may be enabled to initiate MEO for the convenience of emergency staff.

i) Other locations that potentially expedite MEO operation to ensure faster elevator response times must be considered;

Design considerations will be included to preclude false MEO initiations from these remote locations.

j) MEO operation will be terminated automatically after a pre-determined amount, field programmable between 0 and 60 seconds, of time following the elevator arriving at its Designated stop.

If firefighter's emergency operation (FEO) is initiated when MEO stage 2 is in effect, the elevator effected will not respond to the FEO signal until MEO stage 2 has terminated.

.16 Cabinets and Spare Parts

Provide a metal cabinet located in each of the machine rooms. The cabinet will be capable of holding:

Spare parts, including boards that need to be kept protected;

Manuals; and

Aerosols / lubes.

Spare parts are to be provided for each elevator installation and type and shall include:

One (1) duplicate of each board in the controller;

One (1) complete safety edge or proximity edge;

Four (4) door hanger rollers;

Four (4) door gibbs;

Four (4) complete interlocks;

One (1) hall pushbutton assembly; and

One (1) car pushbutton assembly.

6.15.3 Execution

.1 Performance

Levelling – Arrange that the car stops within 3 mm (1/8") of the floor level. Ensure that levelling accuracy is not influenced by load inside the car with the same levelling accuracy achieved at no load and full load and any load in between.

Adjust the door equipment so that the noise level is less than 62 decibels during a full door open and door close operation. Measure the noise levels using a sound level meter set to the "A" scale for a fast response.

c) Arrange the machine room equipment so that the noise level with the elevator running is less than 80 decibels. Measure the noise levels using a sound level meter set to the "A" scale for a fast response.

6.16 Pneumatic Tube System (Division 14)

6.16.1 Overall System Description

Provide a pneumatic tube system that provides for operations as outlined in Appendix 2A Clinical Specification that is capable of efficiently transporting multiple carriers simultaneously with variable speeds.

.2 The system is to be comprised of user stations, carriers to contain and transport light weight unit load materials, and a strategically Designed network of piping and traffic control devices to ensure optimal performance.

Provide pneumatic tube user stations as described in the Clinical Specification. Each station is to be equipped with a control panel with a touch screen display and secure access.

.4 The system is to be a 6 inch (150mm) pneumatic tube system with three carriers per station.

.5 Provide leak resistant carriers that are double lined with a secure lockable integral seal to transport fluid containers, including but not limited to IV bags, blood products, bodily fluid samples and pharmaceutical products.

6.16.2 System Design

Provide a pneumatic tube study that describes the capacity, anticipated wait times, and anticipated trip times of the proposed pneumatic tube system.

Identify the number of carriers proposed based on the clinical demands outlined in Appendix 2A Clinical Specifications, for the Owner's approval. Outline the proposed training for users to ensure optimal performance of the system.

.3 The noise of the blowers and transfer stations must be isolated from patient care areas.

System must be a multiline diverter system that provided for system operations during blockages and provides for variable speeds for sending sensitive items.

Provide monitoring of system from a location confirmed with the Owner.

6.17 Demountable Partitions (Division 10)

6.17.1 Where used all demountable partitions will:

Be restricted to non-fire rated partition locations only;

.2 Include sliding, butt hinge, pivot, aluminum with glass lite, wood with optional glass lite, frameless glass doors and glazing, and double sliding barn doors, all sourced from a single manufacturer.

7 FACILITIES SERVICES SUBGROUP SPECIFICATIONS

7.1 Mechanical Systems Design Principles

7.1.1 General Mechanical Requirements

.1 The Participants will provide Fire Protection, Plumbing, Medical Gas, HVAC, and Integrated Automation Systems that comply with Schedule 2 in conjunction with all the Appendices, the energy and greenhouse (GHG) emissions requirements of Design Management Plan of Schedule 7, any associated mechanical requirements as outlined in other parts of the Project Alliance Agreement, and all codes, Standards, and Referenced documentation as outlined in the Project Alliance Agreement.

Review Appendix 2A Clinical Specifications to ensure that all equipment, rough-in for equipment and support systems have been accounted for and provided. Participants will include for procurement, Design integration, storage, delivery to Site, setting in place, making mechanical service connections, providing mechanical service connections for future equipment, installation, commissioning.

Coordinate all mechanical systems with requirements of equipment supplied by the Owner, and provide all necessary connections required from mechanical systems to allow for a fully functioning system that meets the applicable codes, Standards and equipment manufacturer's requirements.

.4 The Facility will be served by a central mechanical room which may house the major mechanical plant equipment. The mechanical room (Services Centre) will have direct access to outdoor grade (for removal/installation of equipment) and be protected from flooding.

.5 Where motors are controlled by VFD, provide motors with shaft grounding rings wired to the VFD. VFD installations for motors 5HP and over will incorporate both line and load reactors. VFDs will control no more than one motor.

.6 Mechanical services within Communication, IT, Electrical and UPS rooms will be limited to minor intrusions to allow mechanical cooling and ventilation. Refer to Divisions 26 and 27 for further details. All mechanical services installed within Electrical and UPS rooms must maintain a minimum clear height of 3000 mm above finished floor. Do not install any equipment requiring a water connection in the ceiling of the Communication, Electrical, or UPS rooms. Do not route plumbing, drain pipes or hydronic distribution piping in the ceiling of the above noted spaces.

Coordinate with the electrical and communications specification for all mechanical systems that must maintain operation during an expected or unexpected shut down of the Facility's main electrical service. UPS power provided to mechanical equipment

will not be provided from the UPS dedicated for low voltage and communications systems. Where mechanical equipment and devices are required to be served by emergency power, provide UPS, vital, delayed vital, or conditional power.

Equipment, pipes, ducts and fittings will be insulated to conserve energy, prevent condensation, attenuate noise and prevent accidental burns. All services requiring insulation that are exposed exterior of the Facility are to be covered and painted as per exposed services requirements. All services in the mechanical room will be painted or finished as required for exposed services.

.9 Equipment, pipes and ducts will be clearly labelled.

.10 Coordinate all mechanical systems with requirements of all equipment, and provide all connections required from mechanical systems. Provide dielectric isolation between pipes of dissimilar metals.

.11 Provide dielectric isolation between pipes of dissimilar metals.

.12 For all spaces designated for commercial and retail usage, Design all mechanical systems so that the work required to modify the systems for the fit - out will not affect the operation of the main Facility's systems.

.13 For rooms that will incorporate a differential pressure monitor and/or rooms that require a specific differential pressure (medium and high levels of air separation) as required by CSA Z317.2, the Participants will construct the rooms to be air tight. Construction features for Divisions 21, 22, 23 and 25 include gasketed sprinkler escutcheons and gaskets around diffusers, grilles and radiant panels (where applicable). Provide seals around medical gas outlets, headwalls, valve boxes, extinguisher cabinets, sensor junction boxes, fixture drains and water supplies and other components that are recessed within walls that form part of the air seal. Seal ends of controls conduits that terminate within pressurized rooms. Refer to other Sections for sealing required by other Divisions.

.14 Install piping in an orderly manner (aligned with structural elements and at right angles) and routing to enable unencumbered walkway access. Slope piping to permit complete drainage of the system.

.15 Piping should be avoided above Procedure Rooms and sterile areas. If not possible, use appropriate mitigation strategies to ensure potential leaks do not reach the ceiling space.

Potential mitigation strategies include:

Water-proofed interstitial spaces

ii) Double-walled piping

Drip/drain pans

For all approaches, install moisture sensing cables in the containment to alarm to BMS.

.16 Participants are to use computational fluid dynamic (CFD) analysis to model airflow distribution patterns in rooms under all operating conditions (heating, cooling, occupied, unoccupied). The following rooms will be included (at a minimum):

Typical med-surg inpatient room including adjoining patient washroom

Model runs to include operable windows open and closed, bathroom door open and closed, and operation during both normal and outbreak control mode.

Typical OR Procedure Room

Typical Airborne Isolation Room (AIR)

.17 No mechanical equipment will be installed within the Heliport obstacle-free zone. No element of any mechanical system will extend higher than the helipad height (anywhere on the roof).

7.1.2 Equipment Sizing, Spare Capacity, Redundancy, Flexibility and Future Considerations

.1 Systems will be designed to provide reliability of uninterrupted continual operation.

.2 Incorporate flexibility in Design for future changes without major disruption or alteration to the Facility operations or infrastructure.

.3 All redundancy requirements of the referenced codes and Standards, and throughout Sections 7.1 – 7.5 apply.

Refer to section 7.4.1 General HVAC Requirements for details on variances to CSA Z317.2.

.4 Service water, sanitary, storm and gas utilities will be sized with 20% spare capacity (flow).

Air handling equipment, exhaust fans, terminal units, and hydronic pumps will be sized for 20% additional flow and external static pressure above peak Design.

Refer to Section 7.1.3 – Sustainability, Resilience and Climate Change for requirements for mechanical equipment sizing for future climate change.

.6 Distribution piping and ducting systems will be sized for 20% additional capacity.

Refer to Section 7.1.3 – Sustainability, Resilience and Climate Change for requirements for mechanical infrastructure sizing for future climate change.

Hydronic reheat coils serving Operating Rooms and Procedure Rooms will be sized for 20% additional heating capacity (to ensure room temperature can adjust quickly to a change in setpoint).

.8 Mechanical rooms/spaces will be laid out with 20% clear unused area (floor to ceiling or minimum 4m clear volume above floor) for potential future mechanical equipment. Areas to be as large and contiguous as possible to promote flexibility. Pathways to future areas will meet requirements of clause 7.1.7.6.

Ensure medical gas room/area is capable of physical expansion for AGSS capture/recycle system; and

b) Allow for secure exterior space for potential future O2 concentrator and service manoeuverability.

Mechanical shafts and main horizontal distribution will be sized with an additional 20% clear unused area (continuous for full length) for potential future mechanical piping/ducting installations.

Medical gas air compressor, medical vacuum pump, AGSS vacuum pump, laboratory air compressor, and medical gas cylinder storage and distribution systems will be Designed to accommodate an additional 20% capacity (gas volume).

.11 RO water generating systems will be sized with 20% spare capacity (water flow and pressure).

Design piping, ductwork, heating/cooling/heat recovery coils, control valves, air filters, and louvres to meet the following minimum parameters, while accounting for the spare capacities as noted above:

Hydronic pressure drop – maximum piping friction loss: 4m/100m;

Hydronic velocity – maximum velocity based on pipe manufacturer's recommendations;

Supply and return ductwork will be sized within the ASHRAE Fundamentals upper and lower limits for duct air velocities and pressure drop.

Heating/cooling/heat recovery coil face velocity – maximum velocity 2.0 m/s;

Control valve and hydronic coil pressure drop – maximum 21 kPa each;

Air filter face velocity – maximum velocity 2.0 m/s; and

g) Ventilation system air intake louvre free area face velocity – maximum velocity 2.5 m/s

.13 Valved connection points will be provided to connect future equipment to associated systems.

.14 The mechanical plant will be Designed for future expansion, to serve future additions/expansions to the Facility. The layout and Design of the mechanical plant will allow additional equipment to be installed at a future date, without compromising the function of it's originally intended use.

7.1.3 Sustainability, Resilience, and Climate Change Adaptation

Mechanical systems Design will be informed using future climate projections over the life-cycle of the asset, based on RCP8.5 datasets average values.

.2 Utilize RCP8.5 projected future climate change data for the Site, as provided by the Pacific Climate Impacts Consortium (PCIC).

Design loads will be calculated using 2050 and 2080 projections (from Substantiall Completion).

a) Mechanical equipment installed for Substantial Completion will be sized for the Projected 2050 climate.

    i) All equipment spare capacity requirements will use this 2050 sizing as the baseline.

b) Mechanical infrastructure (piping and ducting) installed for Substantial Completion will be sized for the Projected 2080 climate.

    i) All infrastructure spare capacity requirements will use this 2080 sizing as the baseline.

.4 It is the Owner's intent to use a thermal gradient header for the Building's main heating and cooling plant Design. If an alternate approach to system Design is suggested by the Participants, all considerations in regards to equal/better performance in energy consumption, GHG emissions, system controllability, maintenance and operations must be thoroughly reviewed with and approved by the Owner.

The first stage of heating shall be provided by Building recovered thermal energy.

.6 Heating systems are to be Designed to supply and return the lowest heating fluid temperature to satisfy each load, incorporating control logic to automatically reset temperature based on demand.

Cooling systems are to be Designed to supply and return the highest cooling fluid temperature to satisfy each load, incorporating control logic to automatically reset temperature based on demand.

.8 Exhaust and relief air systems must be equipped with heat recovery.

.9 Heat reclaim is to take precedence over air-side and water-side economizing (i.e. 'free cooling' logic shall be used only when the Building cannot benefit from the heat.)

.10 Utilize 'passive' heat transfer of thermal energy from reclaim source to load whenever conditions permit.

.11 Employ passive cooling and heating means to reduce the load on the heating and cooling plants.

.12 Use appropriate Building orientation and exterior solar shading to minimize solar heat gain.

.13 Utilize window shading to reduce summer heat gain.

.14 Rejection of heat via cooling towers will be the last stage of heat rejection so as to minimize loading and conserve water.

.15 Ventilation is to be minimized as allowed within CSA Z317.2 during unoccupied times to minimize energy consumption. Ventilation will be minimized based either on occupancy sensors or operator adjustable schedules.

.16 Where rooms have operable windows, utilize a sensor on each window connected to BMS to confirm if the window is open or closed. Supply and exhaust airflows may be adjusted based on window position so long as relative pressure requirements of CSA Z317.2 are maintained under all conditions.

.17 All energy and water flows are to be sub-metered and available for monitoring, tracking, reporting, and analysis through the BMS for energy/water management. Sub-metering should be sufficient to allow for energy and water end-use breakdown. Refer to Section on Integrated Automation (Division 25) for requirements.

.18 Participate in all applicable utility new Construction incentive programs, and any other grant/incentive available.

.19 Participate in all applicable programs that provide incentives or rebates to Design a higher performance Building that uses less energy and/or emits less GHG.

.20 No external sources are to be used for heating or cooling at the same time heating or cooling is rejected from the Facility.

.21 Use components for multiple purposes wherever possible, for example, using one coil for both heating and cooling to reduce air-side pressure drop.

.22 Standardize control sequences for repeatability and ease of troubleshooting.

.23 Consider TES (thermal energy storage using water-filled tanks or other medium such as the ground) so excess heating or cooling can be stored for use later rather than being rejected from the Building.

.24 Ventilation, lighting and other Building systems shall be slowed back or turned off based on demand, e.g. during unoccupied times using either operator adjustable schedules and/or occupancy/demand sensors. Ventilation system to be Designed such that this does not impact pressure requirements in adjoining spaces. Spaces to remain in an occupied state for a set period after deemed unoccupied to ensure sufficient air changes are achieved before the next occupant.

7.1.4 Catastrophic Event Management

Refer to requirements of Section 5.3 – Catastrophic Event Management.

.2 Design all mechanical piping, ductwork, equipment, and system seismic restraints in accordance with the requirements for post disaster Buildings, as outlined in Section 5.

Equipment will have sufficient redundancy, structural integrity, and seismic restraint to assure the Facility remains operational after a catastrophic event.

The heating plant and emergency generators will each have sufficient back-up fuel storage for a minimum period of 72 hours. If the heating plant and generators use the same fuel, the supplies will be stored in separate tanks.

.5 The medical gas systems will be capable of maintaining a sufficient supply of all medical gases to provide the requirements of the Facility's Post Disaster Operational Areas for a minimum period of 72 hours.

.6 Provide the following emergency service connections:

Domestic Water

Provide a 100 mm diameter Camlock connection on the exterior of the Facility to allow for a potable water tanker truck to make connection to the Facility domestic water services. The connection will be valved and capped and be provided in a locked secure non-corrosive cabinet near to where parking has been Designated for the water tanker truck. The domestic water inlet connection from the exterior will be connected to the domestic water entry station (upstream of booster pump set) with appropriate valves and safety controls.

Sanitary Waste

Provide a sanitary waste holding tank outside the Facility, below grade. Discharge waste from the Facility's main sanitary sewer pipe will be capable of diverting from the municipal sewer service to the sanitary waste holding tank via manually-operated full-port gate valves. The tank will be sized minimum 50,000L.

The sanitary holding tank will have a pump-out connection located near the Designated parking for the sewage pumper truck. The sanitary pump out connection will be located in a free-standing heavy duty, non-corrosive kiosk and will have permanent signage affixed to the kiosk to identify the service and function.

Heating Water

i) Provide two (2) 150mm diameter Camlock connection on the exterior of the Facility to allow for a portable heating water generator (a temporary boiler plant) to make connection to the Facility heating water system.

d) Chilled Water

Provide two (2) 150mm diameter Camlock connection on the exterior of the Facility to allow for a portable chiller to make connection to the Facility chilled water system.

.7 All external connections will be located in service areas away from general circulation routes, and where they can be readily accessible by the individual service vehicles. The Design will take into account the size of the service vehicle and maintaining clear access for all emergency vehicles.

.8 Mass Casualty - Tent Area

The mass casualty tent area will be located outside of the Facility adjacent to the Emergency Department/sheltered ambulance bays. To support this function the follow services are required:

Domestic water services connections will be provided from external 65

mm fire hydrant outlets located at a mechanical kiosk near the Mass Casualty Facility. Each cold and hot service will have an isolation valve within the Facility, be drainable and filled with nitrogen when not in use (and monitored by BMS). At the mass casualty tent area, a water manifold assembly will be required to allow for distribution of the hot and cold water. The water manifold will be a heavy-duty wheeled wagon, that can be anchored into position, and will contain 65 mm hose connections, valves, pressure reducing valves, and a manifold that will have 10 - 20 mm hose connections on each of the hot and cold manifolds. In addition, there will be a 40 mm institutional grade thermostatic mixing valve, complete with thermometers that will be connected to the hot and cold manifold to provide tempered water to shower stations. Provide a total of 10 - 20mm hose connections to the tempered water manifold.

ii) A 40mm medical oxygen connection is to be provided at the kiosk. This will be a dedicated medical gas zone with appropriate zone panel, alarm and isolation valve. The piping will be isolated and charged with nitrogen when not in use (monitored and alarmed though BMS).

A minimum of two (2) connections to the sanitary sewer system will be provided. These connections will be at-grade and regularly covered with a sealed (gasketed) cap rated for the load in which it is located.

.9 Mass Decontamination - Sheltered Ambulance Bays

A mass decontamination Facility will be established inside of the sheltered ambulance bays.

To support this Facility the following services are required.

Medical Gases

- medical air, 4 oxygen, and 4 vacuum outlets will be provided in concealed enclosures around the perimeter of the sheltered ambulance bays.

ii) Water Services

- 3 wall mounted tempered water shower assemblies are to be mounted within the sheltered ambulance bays to allow for wash-down of incoming patients. Each of the shower assemblies will be housed in a stainless-steel surface mounted enclosure with a shower head and shut off valve.
- The trench drain serving the sheltered ambulance bays will be capable automatically (through BMS) of diverting from regular drain (to an oil interceptor) to the decontamination storage tank during periods of mass decontamination. When storage tank is full (high level alarm monitored by BMS), drain will be diverted back to regular drain.
- One (1) 4-bay stainless steel utility sink complete with both hands free faucet for hand washing and manual blade faucet for

other purposes.

The sheltered ambulance bays heating /cooling systems will be capable of heating interior space to 22°C and cooling to 24°C at any time of year.

Exhaust fan(s) serving the sheltered ambulance bays will have space for the installation of bag-in bag-out HEPA filters. Fans will be sized to account for a fully-loaded filter bank.

.10 Emergency Operations Centre (EOC)

Provide accommodation for 100% redundancy of the HVAC system(s) serving the EOC.

.11 Pandemic Outbreak Accommodations

7.1.5 Sound Attenuation and Vibration Isolation

.1 Design all mechanical systems to prevent sound and vibration transmission between spaces, to prevent transmission from mechanical equipment to the spaces, and to minimize sound and vibration transmission to the outside of the Facility. Provide sound attenuation to limit sound levels in accordance with Section 2.2.6 Control of Noise and Section 4.3.7 Community Noise Protection.

.2 All flexible rubber connections and isolators are to have been manufactured no more than one year prior to installation to ensure maximum service life. Date of manufacture is to be clearly shown on each device. This applies to field-installed connections and isolators. Isolators integral/inherent to mechanical equipment (i.e. within air handling units) are exempt from this requirement.

Systems will be provided with noise attenuation screening if the equipment or their exterior openings are located facing and within 200 meters of residential areas.

Provide vibration isolation devices on all equipment with rotating components.

.5 Ensure all suspended equipment utilize spring isolators Designed for the weight and vibration characteristics of the equipment.

Provide flexible connections to isolate mechanical equipment sound and vibration from ducting, piping and electrical wiring systems.

.7 Ensure duct silencers meet or exceed the requirements of the ductwork for cleanliness and inspection and comply with CSA Standards for infection control.

Comply with all other sound and vibration requirements within Schedule 2.

7.1.6 Testing, Adjusting, Balancing (TAB) and Commissioning (Cx)

Refer to Appendix 2H COMMISSIONING for full TAB and Cx requirements.

.2 Provide balancing valves/dampers, flow-measuring devices, and temperature and pressure sensors throughout the system to facilitate system balancing.

The Participants will:

Perform TAB & Cx of all mechanical equipment and systems.

Demonstrate to the Participants that the mechanical and electrical systems are substantially operational by testing, adjusting, balancing, and commissioning the systems. Demonstration to the Participants will include redundancy in the case of equipment failure and spare capacity.

c) As per Appendix 2H retain a Commissioning Provider to conduct the Facility commissioning of mechanical systems.

Utilize a quality assurance system throughout the TAB & Cx process to ensure that TAB & Cx has been performed to all equipment and systems requiring TAB & Cx. Demonstrate the quality assurance system to the Participants prior to beginning TAB & Cx.

e) Ensure any Construction or installation errors are identified and remedied prior to the start of Cx functional testing.

Make all TAB & Cx reports available to the Owner. The reports will identify how much additional capacity and redundancy is available for in all systems, as required by Section 7.1.2 Equipment Sizing, Spare Capacity, Redundancy, Flexibility and Future Considerations.

7.1.7 Operation, Maintenance and Servicing

Ensure all mechanical systems, equipment, and devices are provided with adequate access for inspection, maintenance and replacement.

Access will be configured and located in such a way as to minimize disruption to clinical areas for the performance of maintenance and repairs and life-cycle replacement.

.3 All mechanical equipment will be located indoors or in a fully enclosed and well lit service space provided. This does not apply to rooftop exhaust fans, cooling towers, air cooled condensers, or air cooled chillers;

Exhaust fans with bag-in-bag-out (BIBO) filters will be located indoors.

All mechanical equipment will be accessible from floor level wherever feasible and from catwalks where floor level access is not feasible. In lieu of catwalks, access may be provided by a mobile or fixed staircase and platform including a safety gate, transit floor plate and tie off points incorporated for maintained items of equipment located within service rooms where equipment is stacked. Access to maintain equipment by lift may also be acceptable where there is no requirement for maintenance personnel to move away from or off the lift with the exception of entering an AHU

.5 All mechanical equipment, fixtures, and piping distribution systems will have adequate means to isolate without impact on the system as a whole. All valves will be accessible at floor level wherever possible by person without having to move or climb around equipment to reach.

Pathways will be sized to accommodate the removal/replacement of the largest piece of equipment in that space.

.7 Mechanical connections and valving arrangements for equipment (including that supplied under other Divisions) will be provided with provisions for isolation for removal/replacement without disrupting the operation of the mechanical system the equipment is connected to.

.8 All mechanical equipment will have unions, or grooved couplings (threaded or grooved piping up to 65mm) and butterfly valves or grooved couplings (welded flange or grooved piping 75mm and larger) to allow removal of equipment without having to unthread pipe.

.9 Provide access panels/doors where necessary for access to mechanical systems located behind fixed Building components such as walls, ceilings, floors.

Access doors will be minimum 450mm x 450mm (18" x 18") for body entry; 300mm x 300mm (12" x 12") for hand entry; 200mm x 200m (8" x 8") for cleanout access.

.10 Locate access doors so that all concealed items are readily accessible for adjustment, operation, maintenance, inspection, and lifecycle replacement.

.11 All mechanical systems will be accurately identified on record drawings at the time of substantial completion.

.12 Operation and Maintenance manuals will be provided in both hard-copy and digital form (PDF, complete with indexed hyperlinks to each section).

.13 Laminated and framed, full-size plans of the mechanical schematics will be mounted on the wall of the mechanical rooms or operator workstation areas (confirm location with Facility Maintenance operator).

.14 Provide mechanical system identification in accordance with ASHRAE 223P including:

Ceiling dot stickers, with colours based on sub-system;

Lamicoid equipment tags, affixed to each piece of equipment;

Valve tags (metal or lamicoid); and

d) Sticker or painted stencil labelling on all mechanical piping, ductwork.

.15 All equipment tags on drawings, BMS graphics, and labels will follow a logical and standardized sequence of identification in accordance with ASHRAE 223P. All references between drawings, BMS graphics and labels will match.

.16 Manual valves larger than 150mm will be gear operated type.

.17 Install equipment and piping with adequate service space, access panels and the ability to remove equipment for servicing or replacement. Locate services that require

access for regular maintenance above non-critical spaces, such as corridors, to minimize or eliminate disruptions to the delivery of health care services. Coordinate placement of ceiling devices to ensure sufficient access to ceiling spaces.

.18 Equip all high points in piping with air removal devices such as air collection chambers and air vents. Do not locate automatic air vents above the ceilings of occupied spaces.

.19 Ensure all piping is accessible. No under-slab piping is permitted, with the exception of glycol heating piping for snow melt, if used.

.20 A central negative air system for future renovations will be provided. Refer to section 7.4.8.2(g).

7.1.8 Equipment/Material Quality and Life Cycle Expectancy

Installed mechanical systems will be of the highest quality, suitable for a healthcare environment.

Installed equipment will not be the first instance of that make/model installation within Canada. Evidence of previous successful installations will be provided including references from existing Owners, upon the request of the Owner. Equipment requiring minimum 3 references include:

Boilers;

Steam generators;

Chillers;

Cooling towers;

Air handling units;

f) Fans;

Pumps; and

BMS system.

Provide high efficiency motors for all mechanical equipment.

7.2 Fire Suppression (Division 21)

7.2.1 Fire Protection

Basic Requirements

Provide all required fire protection for the Facility, including the Heliport.

Fire protection sprinkler and standpipe systems will be combined systems with 65mm fire department hose connections for the standpipes located in exits in accordance with applicable codes and Standards.

If required, additional hose connections will be provided to meet the area limitations as indicated by NFPA 14.

Installation of the sprinkler systems will be in accordance with applicable codes and Standards.

65mm fire department hose connections will also be required at the highest landing of stairways with stairway access to a roof or on roofs with a slope less than 4 in 12 where stairways do not access the roof.

The Facility will be divided into sprinkler zones that coincide with smoke control and fire alarm zones.

Each sprinkler zone will be served by a zone control valve connected to the fire line riser.

Fire protection sprinkler zone areas in the Facility containing patient sleeping rooms will match the Facility fire compartment floor areas as defined by the BCBC. Maximum area of each zone will be 1,000 m2.

Seismic bracing will be provided for all fire protection systems.

The fire protection systems and equipment will be Designed to the occupancy classification that it protects.

h) Provide additional 20% flow reserve capacity above the Facility requirements within each system including all equipment, standpipes, mains, and branch lines.

The primary sources of water for fire protection systems will be fed from two different municipal water services.

Connections will have premise protection consisting of approved detector-type double check valve assemblies with approved listed OS&Y gate valves on both sides complete with tamper switches.

Incorporate redundancy in the installation to maintain uninterrupted Facility operation while cleaning, servicing, repairing, or replacing devices.

Participants to confirm if a fire pump is required based on lowest available water pressure from each municipal service.

l) Provide two (2) fire pump systems to ensure 100% redundancy.

m) Each fire pump will be complete with a fire pump controller with integral transfer switch for essential system power supply. The fire pump assembly will be approved by UL, ULC, FM, CSA and comply with NFPA 20. Each fire pump will be complete with a pressure maintenance pump (jockey pump) and controller installed in compliance with applicable Standards.

n) Provide dry-type sprinkler heads and / or a dry-type sprinkler system in all areas that may be subject to freezing temperatures. Wet sprinkler piping serving dry-type sprinkler heads will run within heated spaces.

Heat tracing of branch lines will not be permitted.

o) Provide a double interlocked pre-action sprinkler system complete with detection devices in critical rooms where water damage will affect the operation of key areas/equipment, including the following rooms:

Services Centre Main Electrical Room, Generator Room, D&T Main Electrical Room, Patient Tower Main Electrical Room;

Primary Equipment Room (PER), Secondary Equipment Room (SER), and Server Room (SR);

Emergency Department CT equipment and control room (#36/AC-01);

Medical Imaging CT equipment and control room (#17/DT-02);

Medical Imagine MRI equipment and control room (#76/DT-02);

Laboratory Automated Workstation Room (#15/DT-03); and

All Telecommunication Rooms (TRs).

p) Provide a hybrid water & inert gas fire extinguishing system or clean agent system to protect the Primary Equipment Room (PER) and the Secondary Equipment Room (SER) and the Server Room (SR). The hybrid system or clean agent system will be the first mode of protection for the room. The pre-action wet sprinkler system will be the second mode of protection for the room.

q) Provide a foam fire suppression system for the roof-top heliport. The system will be a fixed type in accordance with applicable Canadian Aviation Regulation. Refer to Section 5.14.24.

r) All sprinkler system piping, hangers, sprinkler heads and accessories installed in MRI spaces will be non-ferrous. Sprinkler heads will be listed and approved for installation in MRI spaces.

s) Provide water curtain sprinklers or other fire protection measures necessary to maintain fire ratings at or near adjacent Buildings, along paths of egress, and/or as required for any code equivalencies.

t) Provide concealed pendant quick-response type sprinkler heads in all areas with dropped ceilings with temperature ratings to suit the specific hazard area. Escutcheon plate to be chrome plated. Concealed sprinkler heads within Operating Rooms, clinical spaces, laboratories and cleanrooms will be provided with an air and dust seal as provided by the sprinkler head manufacturer for an acceptable sprinkler seal in these clean areas.

u) Provide wire cage guards over sprinkler heads in areas where sprinkler heads are susceptible to damage. Provide wire cage guard for all sprinkler heads in all IT rooms.

v) Provide all fire extinguishers as required under applicable Standards and any additional as required by the local Fire Department. Fire extinguishers will be selected and installed based on the hazard classification of the space it serves. Fire extinguishers in finished areas will be installed within fully recessed cabinets. Fire extinguisher cabinets in Psychiatry areas will have a lockable door without glass, accessed by key (held by staff and FMO).

w) Provide fully recessed sprinkler zone control cabinets with shut-off valves, flow switches and flow switch test connections that are readily identifiable and accessible from the floor level. Zone control valves are not to be located in ceiling spaces. Cabinets will have recessed hinges and latches.

x) Fire department connection(s) and location(s) will be approved by the Authority having Jurisdiction. Type of hose inlet connections (threaded or Storz) will be as required by the Fire Department.

y) Provide spare sprinkler heads of each type and a wrench suitable for each head type.

6 extra sprinkler heads for less than 300 sprinklers;

12 for 300 to 1000 sprinklers; and

24 for over 1000 sprinkler heads of each type.

z) Provide fire suppression systems for all commercial kitchen NFPA 96 range hoods.

Each individual hood will be served by a separate system.

aa) Fire suppression systems supply piping will be routed away from areas where a leak or a break could endanger vulnerable patients, equipment or supplies. Fire suppression piping will not be run within or through IT Rooms except for piping required to service the IT Rooms.

.2 Performance Criteria

All fire protection systems will be hydraulically sized to NFPA Standards. Hydraulic calculations will include the applicable inside/outside hose stream allowance for the hazard served.

All fire protection equipment will be approved by a testing/approval agency as listed with the applicable NFPA Standard.

All fire protection equipment installations will be in accordance with manufacturers' requirements and will be in compliance with all BCBC and applicable NFPA requirements.

Participants installer will be licensed and regularly engaged in the installations of fire protection systems and will install, test, commission and certify all fire protection systems and equipment. Commissioning will include the kitchen exhaust hoods fire suppression systems.

7.3 Plumbing (Division 22)

7.3.1 General Plumbing Requirements

Plumbing systems will be Designed and constructed to CSA Z317.1.

Mechanical/grooved piping joint method by Victaulic is acceptable for all domestic plumbing applications. The Following are minimum requirements for grooved/mechanical piping installation:

a) All components will form a complete system by the same manufacturer unless a required product is not manufactured as part of their offering.

All products including pipe, valves, fittings, accessories, factory supplied as well as fabricated assemblies/spools that will come in contact with domestic (potable) water shall be tested and certified to NSF/ANSI/CAN 61 and 372 for commercial hot and cold water ratings (as applicable). Before any Alliance Works commences on-Site, the installing contractor must provide evidence of agency certification to the afore-mentioned standards through official certification documents and/or online certification Listings including tested and Approved water contact temperature(s). Any products found to be non-compliant with these requirements will be replaced at the Participants' expense.

c) All grooved/mechanical joint products to be of a single ISO certified manufacturer.

All grooved/mechanical joint components will form a complete system by the same manufacture unless a required product is not manufactured as part of their offering.

Stainless steel pipe used for hot and cold domestic water systems, domestic hot water recirculation and process water systems, must meet the following criteria:

Schedule 10 stainless steel type 304/304L pipe with:

- ½" to 2" Press stainless steel fittings and valves c/w HNBR gaskets rated to minimum 400psi. Including 3-piece lockable ball valves and domestic hot water recirculation balance valves.
- 1 ½" to 12" stainless steel grooved end fittings, couplings c/w Fluoroelastomer blend centre leg gasket, isolation, check valves, strainers and pressure relief valves (PRV's). For

isolation of the potable water systems, use 3-Piece ball valves and/or BFV's with offset disc. Butterfly valves with rubber encapsulated discs or body will not be accepted.

Grooving tools with RX Rolls for SS will be used for all pipe end preparation of stainless-steel schedule 10 pipe. Press tool from the fitting manufacture will be used for all pressed joints.

Copper tube used for hot and cold domestic water systems, domestic hot water recirculation, and process water must meet the following criteria:

Copper tube used in domestic water piping application will be type K;

Branch piping to individual plumbing fixtures can be right sized (not one size larger than required);

½" to 1 ½" copper streamline fittings with 100% lead free soldered or brazed connections;

2" to 4" Cast brass or wrought copper grooved end fittings, couplings to be installation ready rigid coupling for direct stab installation without field disassembly complete with a Fluoroelastomer blend centre leg gasket, isolation valves, strainers and PRV's. For isolation of potable water system, use BFV's with offset disc. Butterfly valves with rubber encapsulated discs or body will not be accepted;

Grooving tools with "RR" Rolls for Copper will be used for all pipe end preparation of copper Type K tube.

g) If grooved mechanical joints are used for the domestic water system, the following criteria must be followed. Grooved couplings, fittings, Isolation, pressure reducing valves, check valves and strainers shall be the primary method used.

h) If pressed system is used for the domestic or recirculation system, the following criteria must be followed. All press joint fittings, couplings, isolation valves of the same manufacturer shall be the primary method used. System & components must be rated to a minimum of 400psi.

7.3.2 Site Services

Basic Requirements

Provide the following services to the new Facility:

Two municipal water services, for combined domestic water use and fire protection;

Review with Fortis in design development the provisions for future routing of one natural gas service;

One sanitary service;

And one storm service.

Coordinate locations of these services with the requirements of Section 4.5 – utility Infrastructure and the municipal service providers.

Water supply to the Facility will be provided by two separated and isolatable municipal water services for full redundancy to the Site.

Each water supply will be complete with pairs of 100% redundant premise isolation backflow prevention stations.

Each water supply will combine into a common main within the Facility, complete with isolation valves, upstream of required PRV stations (high/low flow) and domestic water booster pumps.

- Supply two (2) sets of high/low flow PRVs or two (2) PRVs with built in low flow by-pass valves in parallel at each PRV station. Each PRV will have a fully open hydraulically controlled back up valve capable of communicating to the BMS system installed before the PRV. If failure of the main PRV occurs, the hydraulically controlled back up PRV will activate maintaining a safe constant water pressure downstream while sending an alarm signal to the BMS system. PRVs will be sized at 8'/sec unless local authority or jurisdiction lists a different flow rate in the Building by-laws.

Each water service will be capable of supplying the domestic and fire service demands plus an additional future demand of 20%.

Provide flexible pipe connections on all water and sewer, and natural gas services (if required) at the exterior face of the Facility. Flexible connectors will be specifically Designed to withstand seismic activity and will have the ability to accommodate both vertical and horizontal seismic movement.

Sub Surface Drainage

A Geotechnical Engineer will determine the extent and scope of ground water subsurface drainage that will need to be handled from the Site.

If it is determined that subsurface drainage will be required to alleviate water pressure exerted onto the bottom of the foundations and/or floor slabs all Alliance Works will proceed with the recommendations of the Geotechnical engineering report.

All under slab drainage will be required to be collected into a sediment sump chamber and / or pump chamber, which will be capable of handling the maximum Design flow rate and delivering the discharge to the Site storm system.

iv) All elements of the under-slab drainage system are to be co-ordinated with the Structural Design.

Provide utility meters and zonal sub-meters for domestic water services to the Facility. Allocate space for utility meters for future natural gas service to the Facility. The location of the water and gas meters including remote readout if installed inside a building will be coordinated with the appropriate utility provider. Each meter shall be connected to the energy management system and BMS and will also have remote readers compatible with the municipal water meter program. Software will provide for Facility water leak detection.

.2 Performance Criteria

Municipal water services provided to the Facility will meet the water quality requirements outlined in applicable codes and Standards.

Installation of the new water service will also be required to meet the requirements of NFPA for all Fire Services supply mains.

Installation will incorporate redundancy to maintain uninterrupted Facility operation while cleaning, repairing, or replacing devices.

Domestic water pressure serving the Facility will be as provided by the municipal water systems and should be confirmed and used for domestic water pressure and fire water pressure calculations in confirm if booster pumps are required. For calculations, use the lowest expected seasonal fluctuation pressure.

If domestic water system pressure exceeds the acceptable delivery pressure noted in the BCBC of 80 PSI, then pressure reducing valves will be required with 100% redundancy.

All service piping within the Facility will be accessible. No service piping inside or outside the Facility will run in or under any concrete slabs.

7.3.3 Plumbing Drainage and Venting Systems

Basic Requirements

Provide sanitary, storm, specialty drainage, and venting systems to avoid disruption to the operation of the Facility or interference with other services during operation and maintenance activities. Design the systems so that, as much as possible, Type I and Type II areas do not need to be entered when performing these functions. Refer to CSA Z317.2 for space Type definitions.

Design all drainage systems such that the system connects to the Site drainage services, utilizing gravity drainage wherever possible.

c) Design pumping systems for subsurface, storm, or sanitary drainage with 100% redundancy (one redundant unit for each active unit) and supply related equipment with emergency power. Size the sump to prevent short cycling of the pump.

Provide engineered packaged pumping system(s) complete with controls and alarms including high water level and pumps failure alarms. Provide local alarms annunciation with audible and visible alarms indication and remote connection via the BMS.

e) All pump chambers will have premanufactured access lids in either single or double configuration with hydraulic assist lift chambers. Design of the access lids will require consideration regarding the loads that will pass over the installation and be supplied accordingly.

Provide drainage and venting piping and fittings of a material suitable for the expected effluent.

All vents will terminate outdoors; the use of air admittance valves will not be permitted.

All piping will be installed parallel to Facility lines. Vertical piping will be installed plumb and horizontal piping level or graded as required by code for sanitary or storm systems. Provide support under all wyes located at ends of branches and all p-traps.

i) Conceal all sanitary, waste, and water piping in walls. Only trap arms and water supply piping will be permitted to be exposed below fixtures.

Fixture outlet piping for adjustable height fixtures will be installed so that no water can collect in the piping at any fixture height.

Provide solid supply tubing to sinks and lavatories for ease of cleaning, no braided flex supplies will be used.

l) Drainage piping material may only be changed downstream at the following points:

where the hazardous properties of the effluent is reduced so a different piping material is suitable: i.e. the branch connects into a main drain line, such that the additional effluent flow dilutes the discharge; and

where a device is placed in-stream to reduce the hazard of the discharge, such as an acid neutralizer.

m) All piping at risk of freezing will not be located outside of a heated space. Heat tracing is not allowed.

Provide a non-corrosive drainage system suitable for discharge from dialysis equipment and wall boxes where dialysis water connections are provided, plus any locations designated for connection of portable dialysis machines.

i) Each of the wall box standpipes are to be provided with an air gap between the box and the standpipe.

Each standpipe is to have a flushing connection which will provide a flushing cycle of water twice a day.

o) Provide floor drains in all mechanical rooms, laboratory, kitchen, workshop, mechanical rooms, all wet areas, service spaces and as noted. Other rooms where water spillage from equipment or operations is expected will require floor drains to minimize maintenance and housekeeping issues.

The provision of floor drains will align with CSA Z317.1. Floor drains in Patient Care Areas to be reviewed and confirmed with IPAC.

p) Floor drains will be sized to handle the maximum anticipated flows including sprinkler test full flow and from backflow preventer relief ports at full flow rated as noted in the manufacturer's information.

q) Provide floor or hub drains for all devices that may discharge water, including, emergency showers and backflow prevention devices.

r) Ensure all equipment drain piping is terminated at floor drains with the proper air gap. Ensure that drains are properly selected and of adequate size to prevent spillover of the waste product into adjacent areas.

s) Provide electronic trap primers that are controlled by electronic time clocks or BMS or other equally effective means as approved by the AHJ at drains that are subject to losing the trap seal, including infrequently used fixtures and p-traps in negatively pressurized rooms, mechanical rooms, housekeeping or soiled utility rooms, floor drains for emergency showers, or floor drains without a dedicated load from equipment or fixtures. Locate trap primers in a location where they will easily be accessed, inspected, and repaired. Trap primers which rely on fixture use or pressure drop will not be accepted.

t) Any machinery/service rooms located below grade will be fitted with fast acting, free flowing drains to rapidly disperse flood waters arising from both outside the Facility (such as severe weather), and also from any internal fluid system breaches. Drainage flow capacity will exceed that of the calculated maximum flow from the worst case system breech. A means of cooling high-temperature heating water before it flows into public areas will also be included to minimise hazards of scalding. Drains will be configured such that water cannot back-flood up into machinery/service rooms (e.g. from river flooding).

u) Provide accessible clean-outs for all sinks and lavatories above the flood-level of

the sink, and above mirrors. Placement will not interfere with accessories for hand-hygiene sinks.

v) Provide neutralizers, interceptors and sediment traps to intercept oil, grease, dirt and solids where necessary and as required by the BCBC and municipal requirements.

w) Provide interceptors in accordance with the manufacturer's specifications.

x) Sizing of the interceptors/ neutralizer will be in accordance with the guidelines set out in the ASPE Design manuals, municipal guidelines, Plumbing Drainage Institute (PDI) Design guidelines or the local AHJ.

y) Install plaster traps for all process sinks where cast / splint procedures are required.

z) Plaster trap installations are to be designed to allow for removal of the entire trap and taken to a maintenance location where the interceptor can be cleaned and returned to service.

aa) Provide grease interceptors to serve all sinks and floor drains in Food Services areas. Run an independent drainage system sloped at a minimum 2%. Locate interceptors outside of the Building (below grade) to allow for servicing of the fixtures.

bb) Each grease interceptor will be complete with 50 mm stainless steel vacuum suction line running from the grease trap to a designated location (for vacuum truck connection). Each end of the vacuum tubing will have Camlock fittings attached.

cc) Each grease interceptor installation will be complete with a min 20 mm hot water hose bibb on the wall in the general vicinity of the interceptor that will be connected to the hot water system.

dd) Not used.

ee) Provide appropriate fuel oil interceptors systems at all fuel storage tanks and filling stations to prevent fuel leakage beyond the designated containment area, and in accordance with all applicable standards.

ff) Drainage from the sheltered ambulance bays will be linked to sump pumps/panels and oil receptors as required.

gg) All sanitary sumps located in the Facility will have bolted-down lids and be gasketed to be air tight.

hh) Provide a dedicated heliport drainage system to contain potential fire fighting foam, post incident foam clean up and fuel spillage. The dedicated drainage system will collect in an underground storage tank (refer to requirements within Civil section.) The heliport will regularly drain to storm (roof drains) when no helicopter is present. Upon helicopter approach (signal through lighting system) or upon fire suppression activation, the system will divert flow to the dedicated drainage system automatically, through BMS control valves. Flow will remain directed to the dedicated drainage system until a period after the helicopter departs. BMS will monitor the storage tank fill level, and provide notification when 50% full. The dedicated heliport drainage system will serve an area larger than the area of the helipad (min 10m from the TLOF edge is acceptable). Refer to 5.14.23.14 and 5.14.23.15. The full dedicated heliport drainage system (materials) will be rated for fuel. Provide liquid medical waste disposal systems for Soiled Utility Rooms in Surgical Services. Units will be powered by tap water and safely empty canisters containing infectious liquid medical waste directly into the

sanitary sewer with no pouring required. The units will be Cardinal Health Medi-Vac Saf-T Pump used in Ambulatory and Neptune Waste Management System (docking station) used in OR.

Provide a decontamination waste storage tank to serve all sources of contaminated fluid waste (decontamination showers, eyewashes, floor/trench drains).

The tank will be minimum 5,000L volume.

The tank will have appropriate ULC listings and be equipped with inlet port(s), vent(s) and suction outlet port(s) to allow for pumper truck suction at a remote suction port external to the Building.

The tank will have liquid level sensors monitored by BMS to alert (remote to FMO) at 50% fill volume, and alarm (remote to FMO and local audible/visual) at 90% fill volume.

iv) Design the decontamination drain system as an acid waste sanitary system complete with P traps, trap primer, and vents so that no noxious fumes return back into the Building.

7.3.4 Plumbing Distribution Systems

Basic Requirements

Design the plumbing distribution systems to avoid disruption to the operation of the Facility during maintenance or repairs and so that, as much as possible, rooms do not need to be entered when performing these functions. Locate all isolation, maintenance, balancing, and other service valves in the corridor ceiling spaces or behind lockable security access panels and ensure they are accessible to the maintenance staff.

Provide solenoid type water shutoff valves to groups of fixtures in high risk Secure Rooms, Psychiatry Inpatient Unit PICU and the Emergency Department P.E.S. Valves are to be controllable from the Workstation- Care Team and to be monitored and controllable from the BMS. Install manual valves upstream of the solenoid valves for maintenance purposes. Access to water shutoff valves is not permitted within the Secure Room.

c) Cross-connect all water service mains within the Facility to allow for seamless Facility operation from either water service. There will be no dead-legs in any service mains or branch lines to prevent stagnant water.

All backflow preventers will be installed and located in areas where maintenance and testing of the devices can be properly and easily addressed.

Drainage for all backflow preventors will be provided in the immediate vicinity of the backflow prevention stations and are to be sized to handle both the maintenance and operational flow rates from the backflow preventers in full operational mode.

In locations throughout the Facility where back flow preventers are required to serve equipment in finished areas, the entire assembly will be installed in a stainless-steel cabinet with a solid door with a key access. The cabinet will have a drain connection adequately sized to accommodate the discharge from the backflow preventer relief ports. All downstream drainage piping will be sized to accommodate the relief port flow.

g) Provide multiple domestic water risers through the Facility. Interconnect the risers on each floor with isolation valves. Arrange the piping and provide sufficient isolation valves on risers and interconnecting pipes such that portions of the risers

may be isolated to facilitate repair or future renovations, while not impacting operation of occupied areas.

h) Provide self-cleaning strainers on the main domestic water supply serving the Facility.

Provide water filtration system on the main domestic water supply serving the Facility. Provide 100% redundancy so that there is no disruption in water supply when maintenance or replacement of components is required. Domestic water service will be filtered to 20 microns .The use of a single device to both strain and filter is acceptable.

Provide turbine style water meters with remote readers and connection to the Facility BMS.

The incoming water stations will incorporate 100% redundancy at each entry point to maintain uninterrupted Facility operation while cleaning, repairing, or replacing devices including PRVs within the water station.

l) Place the valves stations in accessible locations within the mechanical rooms with provisions for adequate drainage of all components in the immediate vicinity of the stations.

Pressure reducing valves dedicated to specific equipment throughout the Facility with specific pressure requirements may be mounted beside the equipment served and do not require redundancy.

If the lowest expected municipal service pressure is insufficient to meet the worst-case pressure requirements, provide a domestic water booster pump system, in an N+1 configuration, to serve the Facility.

The number and arrangement of pumps will be such that peak demand will be met in the event of failure of any one pump. The number of pumps in the pump package will address both high and low flow conditions and the associated issues related to variable speed capabilities. If all conditions cannot be met, then additional pumps will be required to be added to the package.

Pumps will be required to provide minimum pressure requirements on the top floor. Include the domestic water pumping system in the emergency generator calculations. The system will provide uninterrupted water service and constant pressure under all conditions including during the catastrophic event period.

iii) The domestic water booster pump system serving the Facility will be capable of operating during catastrophic event conditions where a tanker water supply will be provided.

o) All point of use filtration will utilize filters with 5 microns cartridges and will be Designed with redundancy to allow for filter replacement without affecting water flow to equipment. Specialized equipment including scope washers and Ice machines will require finer level of filtration and water treatment. Provide charcoal filtration for water and ice machines. Refer to manufacturers' literature for additional requirements. Filter housing will be stainless steel and have pressure gauges and pressure sensors installed (to BMS) before and after filters.

p) Provide isolation valves for all plumbing services to fixtures and equipment. Clearly identify the location and labelling of all valves in valve charts, both on Site and on the "Record Documents".

q) Valves will be located, at a minimum, at each set of piping branches from the main

distribution line, at all locations where the branches serve group of rooms with similar uses, to each patient washroom group, on branches serving individual speciality equipment and fixtures and on all branch lines to hose bibs.

r) All systems will be clearly labeled, and colour coded in accordance with industry Standards including painting and labelling of all pipes, ceiling identification dots, valve tagging, flow directions and emergency valve identification signage.

The water systems within the Facility will ensure water is supplied at the required pressures for optimal fixture operation to all water outlets. Minimum water pressure will be maintained at 35 PSI to the most remote fixture and is to be demonstrated during commissioning.

t) Durable piping materials will allow for 24 hour a day operation with minimal downtime and ensure an operational life of at least 50 years.

u) Domestic water piping will be type L copper (cold and hot water), type K copper (hot recirculation), stainless steel (cold, hot, and hot recirculation), or cross-linked polyethylene (PEXa) (cold, hot, and hot recirculation).

v) Piping joining shall be:

Copper: sweat - 100% lead free solder or brazed, roll-grooved (equal to Victaulic), compression (equal to ProPress)

Stainless steel: threaded (Sch 40), roll-grooved with "RX" rolls, Sch 10 type 304/304L to ASTM A312 (equal to Victaulic).

PEX: cold-expansion (equal to Uponor)

w) T-drill piping joint method is not permitted for any pipe material.

x) Provide flushing and disinfection of domestic water systems to CSA Z317.1 requirements. Review the requirements of CSA infection control Standards to ensure that all aspects of flushing and disinfection have been addressed. Provide independent testing of piping systems once flushing and cleaning has been completed and provide documentation of testing to the approval of the Owner.

y) Provide appropriately sized domestic water supply connections for equipment and fixtures that are installed throughout the Facility. Size all piping for an additional minimum 20% (flow or FUs).

z) Provide all accessories needed to make the connection suitable for the intended use, to meet relevant Standards, and to meet manufacturer's requirements for any connected equipment. This includes shut off valves, point-of-use micron filtration, pressure reducing valves, thermostatic mixing valves, backflow preventers.

aa) Provide plumbing connections to all medical and food services equipment. Refer to Attachment 2I-1 Equipment and Furniture and Appendix 2K Food Services.

bb) Ensure the plumbing systems are Designed to accommodate the requirements of commercial spaces. Make allowance within the base Facility systems for any future plumbing systems needed for future tenant fit-outs of the commercial spaces.

cc) Ensure the domestic cold water and domestic hot water quality is within the required conditions of the applicable codes, Standards, and manufacturer's recommendations for all equipment.

dd) Provide water connection for portable reverse osmosis (RO) machines at each dialysis wall box.

.2 Performance Criteria

Provide flushing and disinfection of domestic water systems in accordance with CSA Z317.1. Provide soda ash treatment where source water pH is lower than 7.0. Provide independent testing of piping systems once flushing and cleaning has been completed and provide complete documentation of testing to the Owner.

Water delivered to the Facility will meet the water quality requirements of all applicable Standards and laws, including CSA-Z317.1 and the Drinking Water Protection Regulation (British Columbia). Filter systems must be capable of operating at high turbidity levels.

c) Provide isolation valves for all plumbing services and clearly identify the location of all valves.

Valves will be located, at a minimum, at each set of piping branches from the main distribution line, and at all locations where the branches serve group of rooms with similar uses and to each patient washroom group. In Mental Health / Psychiatry Inpatient Units provide isolation valves within the public area in an easily accessible access box to allow access without the need for a ladder or keys.

Isolation valves for piping 50 mm and smaller will be ball valves with solid bronze body and a chrome plated bronze ball with lever handles. Isolation valves for stainless steel pressed piping 50mm and smaller will be 3-piece stainless steel ball valves. All isolation valves 65 mm and larger will be of a butterfly style with offset disc, grade "P" Fluoroelastomer seat, stainless steel stem, with gear operators 150mm and over. Valves with rubber encapsulated body or disc will not be accepted. Butterfly valves will be brass castings body for copper system and stainless steel body and disc for stainless systems.

Ensure that the Design of the incoming domestic water station provides for adequate drainage systems that will handle both the maintenance and operational flow rates from the strainer discharge and the backflow preventers in full operational mode.

Insulate storm drainage, domestic water piping, cooling water and exposed p-traps throughout. Ensure plumbing systems are not installed in locations subject to freezing. Heat tracing is not allowed.

h) Water delivered to the Facility will meet the water quality requirements of all applicable Standards and laws, including CSA-A317.1 and the Drinking Water Protection Regulation (British Columbia). Filter systems must be capable of operating at high turbidity levels.

Domestic water service will be filtered to 20 microns.

7.3.5 Domestic Hot Water Systems

Basic Requirements

Provide a domestic hot water system with sufficient capacity and recovery rate for the hot water requirements of the Facility. Allow for 20% expansion capacity within each system for future flexibility.

Calculate domestic hot water demand in accordance with ASPE Plumbing Engineering Design Handbook and to meet the demands of CSA Z317.1.

Domestic hot water supply will be of adequate temperature to serve the needs of the Facility and will be stored and circulated at temperatures noted in CSA Z317.1 Table 1.

Provide a central mixing valve, in N + 1 configuration, to reduce the distributed temperature from stored tank temperature to distribution temperature.

Provide pressure balanced/ thermostatic mixing valves, where temperatures are required to be less than 60ºC at point of use as required by CSA Standards.

Provide fail safe bypass for over temperature water after central mixing valve.

g) Provide alarm to BMS for over temperature conditions.

h) To permit uninterrupted service provide normally closed bypass around the mixing and diverting valves complete with lockable valve.

i) Bypass will connect to piping upstream of over temperature monitoring sensor to permit continuous monitoring of domestic hot water system supply temperature.

The domestic hot water heating system will be configured to provide N+1 redundancy and will meet or exceed the energy efficiency requirements of ASHRAE 90.1.

k) Domestic hot water storage tanks and heat exchangers will be configured in an N +1 configuration, such that the system maintains 100% capacity after failure of a single tank or heat exchanger.

The Design of the domestic hot water system may involve two or more pressure zones depending on incoming pressure and Design considerations.

Each pressure zone will have a separate domestic hot water recirculation system complete with reheat capability to maintain the pressure and temperature integrity of each zone.

Ensure that the Design of the domestic hot water system will provide timely delivery of hot water to all fixtures with no dead legs in the system and will include a recirculation system between the distribution system and the hot water generation equipment.

o) Locate pressure / thermostatic mixing valves serving plumbing fixtures will be placed as close as possible to the fixture it serves to minimize dead legs and at accessible locations to facilitate maintenance inspection, repairs and replacement.

p) Tempered water, set for 38°C, is to be provided by local under counter mixing valves when serving individual plumbing fixtures.

q) Domestic hot water mixing valves when used for temperature sensitive locations within the hospital such as specialty baths or sinks will be required to have visual temperature gauges accessible at the point of use and are to have a high temperature alarm that would be both local and on the BMS.

r) Design the domestic hot water system to prevent colonization, growth and spread of Legionella bacteria and other water-borne pathogens within the hot water generation plant, piping, fixtures, or any other component. Design methods may include heat-based control, active treatment systems, eliminating dead-leg piping; flush to drain valves; and minimizing uncirculated piping by connecting the circulation system as close as possible to fixtures. Designs will conform to the latest ASHRAE / NSF/ ASPE standard on Legionella Design for Health Care Facilities.

s) Develop a Water Quality Risk assessment in accordance with ASHRAE Standard 188 – Legionellosis: Risk Management for Building Water Systems and based on the installed Design to aid the development of ongoing water quality maintenance procedures by the FMO.

t) Domestic hot water will be heated using electricity (not fossil fuel) as the primary energy source.

u) Recirculate domestic hot water from the distribution system(s) back to the

generating equipment within each appropriate pressure zone.

v) For domestic hot water recirculation, provide thermostatic valve for automatic balancing on each recirculation branch. Thermostatic balancing valve shall have ability for manual temperature adjustment, c/w lock out feature, built in temperature display and shut off function.

Performance Criteria

Provide a domestic hot water generating plant and hot water storage equipment to meet the requirements of CSA Z317.1 and within the Design guidelines as mentioned above.

b) Piping and valves will be appropriately sized to ensure adequate flow which does not promote stagnation or accelerated pipe erosion.

Monitor hot water temperatures, at the storage tank, in the supply and return piping, and at the ends of each piping loop on each floor, via the BMS and provide alarm outputs when the temperature exceeds or drops below the Design set point range.

7.3.6 Plumbing Fixtures

Basic Requirements

Provide fixtures as described in the Schedule 2 Alliance Works and Project Description and as needed to comply with all applicable codes and regulations.

Provide all plumbing fixtures made of impervious, durable materials suitable for a hospital Facility. Select fixtures with proven acceptable hospital performance from previous installations.

c) All plumbing fixtures will be supplied complete with all hangers, accessories for mounting, water supplies and shutoffs, flexible connectors, drain waste and vent connections, water hammer arrestors, all low voltage wiring supplies, wall boxes and access panels.

All low voltage wiring, cables will be mounted in junction boxes located within the wall below the fixture and will include stainless steel face plates with vandal proof screws.

All line voltage plugs to low voltage wiring connections will be concealed in access boxes that are not accessible to the public or in concealed ceiling locations that are not visible without removal of an access panel.

Review and confirm with the Participants all plumbing fixture selections during the Design phase and Construction shop drawing review. Pay special attention to performance relative to infection control and prevention of the spread of diseases.

g) Provide fixtures with evidence-informed anti-microbial coatings.

Provide offset drains for sinks to minimize aerosolization of traps. Required for all hand-hygiene sinks and Emergency Department exam room sinks.

i) Provide all appropriate services and connections to all equipment for patient care areas and all other areas. Provide all accessories as needed.

.2 The following Design information applies to lavatory and faucet selections for the Facility:

The lavatory fixtures will be either a wall hung style fixture, a drop- in style vitreous china basin, (where located in non- clinical / non patient washrooms) or a solid surface fixture which is molded into a countertop.

Provide lever control taps for patient washrooms.

Counter mounted lavatory basins will have all surfaces which slope into the basin.

All openings required for the faucet installation will be factory installed.

Select all lavatory and faucet combinations to minimize the potential for splatter and contamination.

Faucets will have laminar flow Design to minimize the splatter.

g) Provide high profile gooseneck lavatory faucet fittings will be provided for all lavatory basins and the faucets will have anti-splash, anti-aerosolizing, faucet fittings (i.e. laminar flow) that do not retain air. Avoid low profile gooseneck faucet fittings. In patient care areas the laminar flow will be integrated into the base, no fittings in the spout.

h) Provide lavatory basins are not to have an overflow opening installed in the body of the basin. Lavatories with overflow outlets that are plugged with aftermarket plugs will not be accepted.

Fixtures not equipped with overflows will need to be provided with a waste tailpiece that does not have overflow openings.

j) All public lavatory basins will not have drain plugs but will be installed with PO perforated drain openings.

All lavatory basins will have the water and waste fittings below the fixture protected with a skirt, provided by the manufacturer, to hide the plumbing components and to address infection control. The Design of the skirt will be in conformance with the requirements of the Accessibility Requirements of the BCBC.

Public washroom lavatory fixtures are to have electronic hands-free type faucets with single temperature discharge that can be adjusted and set to the desired temperature, at the mixing valve, below the fixture. Initial temperature setting - 38°C.

Electronic faucets will be connected to the base Building power source - delayed vital - hard wired with concealed power boxes and transformers.

m) Patient washroom lavatory fixtures in Psychiatry areas are to have electronically operated ligature resistant faucets with single temperature discharge that can be adjusted and set to the desired temperature, at the mixing valve, below the fixture. Initial temperature setting - 38°C.

Electronic faucets will be connected to the base Building power source - delayed vital - hard wired with concealed power boxes and transformers.

Access for the plumbing and electrical to these fixtures will be provided external to the actual washroom complete with access panels.

Fixtures selected for these applications are to have totally enclosed basins and skirts and be specifically Designed for ligature resistant applications.

Lavatories provided for Bariatric applications will be constructed as a wall mounted epoxy coated stainless steel sinks suitable for installation in a Bariatric room and will be capable of withstanding a downward pressure of 500 k on the front of the fixture. The lavatory deck may be either epoxy coated stainless steel or be a solid surface material.

Bariatric fixtures will not be support from the Facility walls but must be supported by an independent support structure that is attached to the floor on which the fixture is installed.

The following Design information applies to sinks and sink / faucet selections for the Facility:

Stainless steel sinks – utility sink, process sink, kitchen sink and scrub sink., used in a clinical setting throughout the Facility, will be either a stand-alone wall hung stainless steel fixtures with wall hangers or will be stainless steel bowls which have been integrally welded into a continuous stainless-steel counter.

The grade of the stainless steel used for the fixture will need to be selected to match the application in which the fixture will be used. The size, depth and number of bowls for each fixture will need to be selected in consultation with the Participants to accommodate the intended use of the fixture.

The bowls of the sink will have fully rounded corners and will be complete with a drain assembly which is appropriate for the intended end use of the fixture.

Drop in or under mounted stainless-steel sinks will not be considered in all clean area.

Drop in style stainless steel sinks can be considered for locations such as nutrition stations, staff room, non-patient rooms and workshops. All drop-in stainless-steel sinks will have a back ledge included with all necessary punching's to accommodate the selected faucets.

Sinks will meet the requirements of CSA Z8000 including materials, size, Construction, location, controls, backsplash, soap and lotion dispensers, and accessibility.

Provide kitchen sinks with integrally moulded coved backsplash.

Pharmacy sinks in all areas of the facilities including modular clean rooms, scrub rooms, ante rooms, and dispensary areas, provide a type 316 stainless steel sink with an underdeck mounted, 150 mm manual blade handle faucets and gooseneck laminar flow spout.

Scrub sinks for Procedure Rooms, treatment and examination rooms will be a single basin stainless steel scrub sink with integral backsplash, hands-free faucet, and soap dispenser for hand hygiene. The scrub sink will be suitable for a user conducting surgery or other sterile procedures and supplied as a proprietary equipment item by a medical equipment manufacturer.

The faucet will have sufficient clearance and height to allow for proper surgical scrubbing to occur and will have a spray head that will provide no splash coverage during usage.

Electronic hands-free type faucets will be specific to the needs of surgical scrubbing procedures and will remain on as required by the user.

Faucet will have a single temperature mixing valve to supply integral temperature control that can be user adjusted.

Electronic faucets will be connected to the base Building power source - delayed vital - hard wired with concealed power boxes and transformers.

Access for the plumbing and electrical to these fixtures will be provided below the scrub sink complete with access panels. Fixtures selected for these applications are to have totally enclosed basins and skirts and be specifically Designed for scrub procedures.

Operating room scrub sinks will be two compartment stainless steel sink located in an alcove adjacent to each of the OR's.

Scrub sinks for Operating rooms will be two basin stainless steel scrub sink with integral backsplash, knee-operated faucet, and soap dispenser for hand hygiene. The scrub sink will be suitable for a user conducting surgery or other sterile procedures and supplied as a proprietary equipment item by a medical equipment manufacturer.

The faucet for each sink compartment will have sufficient clearance and height to allow for proper surgical scrubbing to occur and will have a spray head that will provide no splash coverage during usage.

Electronic knee-operated type faucets will be specific to the needs of surgical scrubbing procedures and will remain on as required by the user.

Faucet will have a single temperature pressure balanced mixing valve to supply integral temperature control that can be user adjusted.

Electronic faucets will be connected to the base Building power source - delayed vital - hard wired with concealed power boxes and transformers.

Access for the plumbing and electrical to these fixtures will be provided below the scrub sink complete with access panels.

Fixtures selected for these applications are to have totally enclosed basins and skirts and be specifically Designed for hospital scrub procedures.

f) Laboratory sinks, including bio-hazardous waste sinks, provide type 316 stainless steel sink with under deck mount faucets with 150 mm blade handle and gooseneck spout. Sinks will be large and deep enough to accommodate the intended application.

Equipment cleaning sinks and other utility sinks provide sinks with underdeck mounted, 200 mm manual blade handle faucets and gooseneck laminar flow spout. Ensure that sinks are large and deep to accommodate proper washing of equipment and that materials and waste piping are suitable for the intended application of the sink.

h) Adjustable height sinks in MDRD, and satellite reprocessing areas.

i) The adjustable height sink will be a specialty sink of moulded acrylic Design and will have a 300mm vertical adjustable height controlled by a stainless-steel foot pump mechanism. The sink bowl Design will be to minimize splashing on surrounding floor. The manually controlled faucet that is supplied with the sink will have a separate spray hose with thermostatic mixing valve for hot – cold adjustment.

The Assistance with Daily Living kitchen sink will have an adjustable height counter to American Disabilities Act standard height levels. Faucet to be ADA blade handles hot – cold with gooseneck swivel faucet. Drainage and water to meet adjustable heights.

Hand washing sinks or hand hygiene stations for nursing stations, patient care

areas, examination rooms, Food Services, emergency room, soiled utility rooms and other similar function rooms will have electronic hands-free type faucets with either a gooseneck wall mounted spouts or an ozonated bubbler systems that will supply single temperature water to the sink.

The water supply is to be pre adjusted and be set for a temperature of 35 C / 95 F.at the concealed mixing valve.

The basin of the sink will be adequately sized as per CSA Z8000 for proper washing and scrubbing of hands.

iii) Ensure that the faucet on Hand Hygiene sinks does not discharge directly into the drain opening.

Hand Hygiene sink will be a wall hung fixture that is constructed in compliance with CSA Z8000 including size, Construction, location, backsplash, soap and lotion dispensers and accessibility.

v) Hand hygiene sinks basins will be vitreous china,stainless steel or composite materials approved by IPAC.

Provide a single temperature, electronic sensor, gooseneck faucet. Electronic sensor faucets for hand hygiene sinks will not have means for user to adjust water temperature but will have a temperature and pressure balanced mixing valve located below the sink.

Refer to Best Practices for Hand Hygiene Facilities & Infrastructure in Healthcare Settings.

viii) Provide and install disposable glove box holders in proximity to point-of-care in consultation with IPAC.

l) Faucets for lunchrooms, staff rooms, and general-purpose work rooms may be deck mounted, 200mm center to center with gooseneck spout and 150 mm manual blade handles.

m) Faucets for all other areas will be chosen to ensure that infection control is addressed but will include underdeck mounted faucet body, gooseneck spout with laminar flow discharge and either electronic control or 200 mm long blade handles.

Stainless steel combination lavatory / toilet anti ligature security fixtures will be required where psychiatric patients may be present and unsupervised. All aspects of these fixtures will be Designed to meet anti ligature requirements.

ii) The combination lavatory / toilet will include an elongated bowl with contoured seat, ligature resistant skirt, blowout style operation, oval shaped bowl, ligature resistant piezo electric operated bubbler / filler, slow drain, and a 4-point anchor system for installation in a service chase.

Performance Criteria

Select all wall mounted sinks for patient and handicap use to have a removable purpose-built skirt to house the water and drain components. Skirt to be Designed to allow for handicap access of the fixture, to protect patients from touching hot objects and for ease of maintenance.

Barrier-free plumbing fixtures, fittings, and carriers are to be provided where required and will need to be suitable for use by Bariatric users. Water closets not Designated specifically for Bariatric use will be wall

mounted.

Barrier-free plumbing sink fixtures, fittings, and carriers are to be provided where required in the Appendix 2A Clinical Specifications and will be installed in accordance with the BCBC requirements.

.4 The following Design information applies to water closet selections for the Facility:

Water closets are to be constructed of either Vitreous China or stainless and will be selected from fixtures that will mitigate infection control risk. The bowl must be designed to accommodate the flow rate of the flush valve and to minimize the aerosolization of the toilet contents. All water closets must meet a certified MAP rating of 1000. All water closets will be wall-hung.

All fixtures are to be designed for installation in accordance with the manufacturer recommendation.

ii) All water closets that are designated as located in Mental Health areas will incorporate anti-ligature Design in all the components.

Provide seat covers on all patient and accessible water closets. Ensure that all flush valve operators extend above the height of the open cover.

All water closet seats are to be heavy duty Construction with stainless steel posts and self-sustaining hinges.

Public water closets will consist of wall mounted elongated bowls with an open front seat with no cover.

- Flush Valve will be a concealed electronic, hands-free flush valve with manual override.
- Flush valve connection to the water closet will be through an exposed top spud.
- Height to be 430 to 480 mm from floor to rim of seat.

Patient water closets will consist of wall mounted elongated bowls, with an open front seat and with cover.

- Flush valve will be a concealed manual high/low dual flow flush valves.
- Flush valve connection to the water closet will be through an exposed top spud.
- Mounting height to be 430 to 480 mm from floor to rim of seat.

In Secure Rooms provide a white power coated stainless steel, floor mounted, back discharge, anti-ligature, one-piece sink / toilet combination unit with hemispherical penal filler/bubbler with mouth guard, integral seat, push button controls and in wall concealed flush valve.

- The Secure Room fixture will include anti-flood device with either piezo electric or pneumatic controls on supplies/waste to toilet and/or lavatory components.
- Refer to the Provincial Quality, Health and Safety Standards

and Guidelines for Secure Rooms in Designated Mental Health Facilities under the B.C. Mental Health Act for additional requirements.

Provide barrier-free plumbing fixtures, fittings where required.

Provide Designated Bariatric patient washrooms with wall mounted, back discharge, anti-ligature, epoxy coated stainless steel toilet with integral seat, push button controls and in wall concealed flush valve with a minimum load for Bariatric Residents.

- Bariatric water closets shall be chosen and positioned to allow for the use of Commodes.
- Floor mounted Bariatric water closets will require special water closet carriers that are extra heavy duty and will require additional wall space for installation.

Refer to Appendix 2A for type and scope of coverage for bedpan washers (high level disinfection units). Appliance installation will be flush to the wall with a mounting frame, recessed above the toilet. The appliance must have hot/cold water and waste connections for a concealed application. The appliance will be electrically heated (not provided with central steam connection).

.5 The following Design information applies to soiled utility room plumbing fixture selections for the Facility:

Each soiled utility room will have a large stainless-steel sink for use in wash up of equipment and hospital goods. This sink will be an integral part of a larger stainless-steel counter.

The size of the sink will need to be appropriate to the size of the equipment and goods to be washed. Minimum depth to be 250 mm.

The size, depth and number of bowls for each fixture will need to be selected in consultation with the Owner to accommodate the intended use of the fixture.

Each sink is to have a below deck mounted faucet with gooseneck spout and 200 mm manual blade handles on the hot and cold water supply.

Water, drainage and sanitary vent piping to be installed in accordance with the BCBC and the manufacturer's recommendations.

Each soiled utility room will be supplied with a plumbed in wall mounted exposed emergency eyewash station positioned next to the Hand Hygiene Sink.

.6 The following Design info applies to housekeeping service sinks for the Facility:

Each housekeeping room will have a floor mounted molded stone sink for use in general housekeeping within the Facility.

b) The size of the sink will be 600 mm x 900 mm x 250 mm deep and will be complete with rigid vinyl protective caps on exposed sides and have a heavy duty stainless steel wall guard on the walls.

Each fixture will have a two sets of wall mounted faucets each with manual cross blade handles on the hot and cold water supply.

The one set of faucets will be with a top pail brace, integral vacuum breaker, hose end and integral stops for general water supply to mop pails.

The second faucet will be complete with 12 mm reduced pressure back flow preventors on the hot and cold supply, hose end supply, integral stops, hose end connections to allow for connection of chemical mix tanks

The reduced pressure back flow preventors will be mounted in a stainless steel box with hinged solid door located within the walls of the housekeeping room and will have a direct drain from the box to the utility sink.

.7 The following Design information applies to plaster room Sinks for the Facility:

Single compartment, wall hung, type 304 stainless steel, minimum dimensions to be 850 mm x 375 mm x 200 mm interior dimensions.

b) Wall mount sink faucet, 200 centers gooseneck spout with laminar flow outlet, manual 100mm wrist blade handles, and mounted on wall behind the sink.

Wall mounted spray assembly with heavy duty hose and hose retainer. Water supply to be compete with a thermostatic mixing valve with temperature set for 38°C.

Plaster room sink is to be complete with a stainless steel solids interceptor with perforated removable stainless steel basket. The interceptor is to be mounted on a stainless steel dolly with ball caster and is to have valves and couplings on both inlet and outlet to allow for removal and cleaning.

The following Design information applies to shower selections for the Facility:

Patient Shower - Psychiatry

Provide Patient showers within Psychiatry IPU with electronically controlled pressure balanced and high temperature limit shower valves, for tempered water supply through single push button (piezo) that are flush to ensure anti-ligature safety

Shower to be complete with a single anti-ligature fixed shower head.

Provide additional soft seated check valves on each of the water supplies.

Locate mixing valve away from patient reach within secured cabinet while reducing dead-leg to shower.

Design shower bases to ensure that the water is sloped towards the shower drain and is contained within the shower area.

ADA accessible patient showers must be free of barriers with no lip between the washroom floor and shower.

Install a floor drain in the drying area outside of each shower stall.

Patient Shower

Patient showers stalls must be free of barriers with no lip between the washroom floor and shower.

Shower will be provided with a pressure balanced and high limit shower mixing valve with additional soft seated check valves on each of the water supplies.

Handheld shower hoses must a have smooth easy to clean surface.

The length of the shower hoses to be sized to ensure the shower head cannot be submerged in any adjacent plumbing fixture.

If the shower stall is a fixed architectural stall, ensure that a floor

drain is installed with the floor sloped to the drain.

Slide bars provided for handheld showers must be Designed and load rated to act as grab bars.

Shower bases must ensure that the water is sloped towards the shower drain and contained within the shower area and drain fully without puddling.

Shower bases constructed of fiberglass or acrylic will not be considered.

Staff Showers

Showers for staff use may be fiberglass or acrylic but must not be less than 1200 mm x1200 mm.

- Staff showers will be provided with a pressure balanced and high temperature limit shower mixing valve with additional soft seated check valves on each of the water supplies.
- Staff showers will be handheld style with a slide bar and locking mechanism.

Handheld shower hoses must have smooth easy to clean surface.

The drying area adjacent to the shower stall must also contain a floor drain.

d) Decontamination Showers

Provide surface mounted shower assemblies containing a hand-held shower, and a pressure balanced mixing valve to provide individual temperature control to each shower. The shower areas will have a trench drains to ensure that water is contained within the area. All water from the shower trench drains will be directed to the decontamination water storage tank.

.9 The following Design information applies to LDRP tub selections for the Facility:

For LDRP rooms with a requirement for a bathtub, the tub will be a free standing acrylic or high density fiberglass deep tub. The tub will be completely free standing and will allow for walking clearance around the tub. The tub will be with the patient washroom.

Provide a fill spout and tub filler with cross handles. LDRP tub is to be provided with water services that are one pipe size larger than what is requested in the manufacturer installation manuals.

c) Water supply to the LDRP tub is to be supplied through a thermostatic mixing valve with digital readout and high temperature limit alarm which is connected to BMS in addition to a local alarm. The mixing valve assemble will be concealed within the adjacent walls with a stainless steel front access panel.

The LDRP bathtub will also include for a Patient shower in the near vicinity of the tub. All requirements for the Patient shower will be the same as outlined above except that the shower hose assembly will be double length.

The bathtub installation will require a high flow drain connection located below the tub with an additional floor drain within the room.

The following Design information applies to emergency eyewash and shower stations.

Emergency showers and eyewashes stations are to be located and designed to supply tempered water within an acceptable time frame in accordance with the Occupational Health and Safety legislation of British Columbia. Provide signs identifying location and directions for their use.

Where standalone emergency eyewash stations are required as determined by Design safety risk assessment, the fixtures are to be a stainless steel wall hung assembly complete with a water receptor, two soft spray eye wash spray heads with caps, tempered water supply and drain piping.

c) The eyewash station will have a highly visible hand paddle that will operate the eyewash upon activation.

Where emergency eyewash stations are required to be located with a plumbing utility sink, the fixture will be a highly visible, swing away assembly that contains two soft spray heads, caps, and tempered water service.

e) The eyewash station will be activated when pulled down into position over the sink.

The selection of the emergency eyewash will require coordination of the size of the sink and location of the faucet and eyewash to ensure that all components can be safely operated in an emergency.

g) The emergency shower / eyewash stations located within public and finished work areas of the Facility are to be an exposed highly visible shower head dropped below the ceiling to the appropriate height. Activation of the shower will be from a wall mounted lever adjacent to the shower assembly.

The eyewash component of the shower station will be a wall mounted concealed assembly which will be pulled down out of the wall and will activate upon dropping down. The waste from the eyewash will be hard piped back into the wall and connected to the Sanitary Waste system.

i) Floor drain will be required for the emergency shower.

j) Emergency shower and eyewash assemblies are to be supplied by an approved thermostatic mixing valve assembly that are specifically Designed for safety equipment installation. The mixing valve assembly will be certified to ANSI Z358.1 will be sized to serve the demand of the fixtures served and will fail safe to cold water.

k) The hot water recirculation system will be installed as close as possible to the mixing valve assembly.

l) The Participants will provide test cones for routine testing of the emergency showers.

.11 The following Design information applies to Cold Water hose bibbs used throughout the Facility:

Exterior hose bibb / hydrants serving outdoor spaces will be encased non-freeze concealed type with lockable hinged doors. Apply and implement anti-ligature and vandal proof Design features. Each hose bibb/ hydrant will require an individual shut off on the branch line servicing the fixture located in a non freeze location within the Building.

The Facility water supply will be protected by an approved backflow prevention device.

Interior hose bibb/ hydrants for workshops and mechanical room will be exposed chrome plated ball valve with hose end fitting and cap securely anchored to the

structure.

Hose bibb/ hydrants located on the roof to service equipment maintenance and the cooling towers will be non freeze upright roof hydrants with shut off valves and drains located internal to the Building.

Spacing of hydrants around the exterior of the Facility will be no greater than 30 meters apart.

Provide an irrigation system for automatic (via timed/condition controlled system) watering for all garden plots.

.12 The following Design information applies to the Morgue plumbing system:

In the Morgue, provide plumbing services to all Morgue plumbing fixtures.

All water services suppling the Morgue plumbing fixtures will require a reduced pressure back flow preventor on the main service to the Morgue zone. The backflow stations will need to be located exterior of the Morgue in a location that allows for proper maintenance.

All sanitary waste piping and all floor drains / trench drains will be required to be constructed of stainless steel with mechanical couplings.

.13 For the Scope Processing/Decontamination room MDRD

a) Provide endoscope reprocessor equipment connection to a potable water system and drain connection per the manufacturer's recommendations. The water supply will have a thermostatic mixing valve with temperature display and bypass valve piped to the drain. Provide a wall mounted pre-filter assembly with isolation valves. Filter assembly will be sized based on the source water and final treatment requirements.

b) Provide two height adjustable double-bowl sink with clean up counter (Steris Amsco or equal). Unit to come with sink dimensions: 24" W X 17" L X 10" D (610 X 432 X 254); one water saving faucet with hot and cold water; one pure water faucet; one air gun for cleaning tubes; and three, 3-foot (76.2) flexible hoses to connect to water supplies.

.14 Performance Criteria

Ensure all electronic sensor activated fixtures meet the following requirements:

All sensors will be hardwired and served by the delayed vital electrical system, so water is available during a power outage;

The duration of sensor faucet flow will be adjustable. All sensors will be set at 10 seconds but will be able to operate for a minimum of 45 seconds without interruption of flow, to facilitate proper hand washing.

Sensors will retain the ability to turn off automatically when hands are no longer in the sensor range.

The domestic hot water recirculation system will be connected to the fixture's hot water supply immediately next to the fixture shut-off at the wall. All sinks are to be connected to the domestic hot water recirculation system.

Ensure that the Design of the domestic hot water system will provide timely delivery of hot water to all fixtures.

Provide water hammer arresters on the cold water and hot water supply to each fixture or bank of fixtures served by a single branch in accordance with PDI Standards.

Ensure fixtures with electronic flush valves also have a manual flush operator. Pressure assist flush valves will not be used.

If system pressure exceeds the acceptable delivery pressure, then provide pressure reducing valves with 100% redundancy. Place the valves in accessible locations.

Provide fixtures with evidence-informed anti-microbial coatings.

Provide plumbing fixtures that comply with the following requirements:

Toilets (patient) - 4.8 L/flush

Toilets (public) – 6/3 L/flush

Urinals - 1.9 L/flush

Staff showers – 7.8 L/min

Patient showers – 7.8 L/min

Hand hygiene sinks – 6.8 L/min0

Sinks and lavatories – 5.7 L/min

7.3.7 Reverse Osmosis Water Systems

Provide a dedicated RO (Reverse Osmosis) filtered water system for the following non dialysis areas of the Facility:

MDRD (washer disinfectors, cart washers, sinks). Refer to Attachment 2I-2 MEQ Specifications for specific equipment connection requirements.

.2 Each system will be complete with redundant components that will allow for the systems to maintain full capacity during all maintenance and cleaning and disinfection.

.3 Each system will be a complete package unit supplied from one manufacture which will produce high-purity water which is to be continuously circulated throughout the distribution loop(s).

Install distribution piping in accessible locations to allow replacement with minimal disruption of patient care areas.

.5 Piping for the RO plant (connections between filters, RO generator, storage tanks, UV, distribution pumps) will be type 316 L stainless steel or PVDF. Piping from the distribution pumps to the zones will be 316 L s.s., PVDF, or PEXa.

.6 Joints will use a method appropriate to the material used, and not result in any internal beading or lips in which biological growth could occur.

Stainless steel: welded joints

PVDF: heat fusion joints

c) PEXa: cold-compression joints

All welding of the stainless steel piping will include for pickling and passivation after the welding process.

.8 All stainless steel piping installation will make allowances for expansion and contraction of the piping system when the piping is subjected to a maximum disinfection cycle of 90°C.

Each system will include the following minimum components:

Backflow prevention;

Tempered Water supply;

Particulate filtration;

Dichlorination system;

Pumps;

UV Sterilizers;

Bacterial Traps;

Storage tanks;

i) De-ionation filter beds,

RO filtration; and

all necessary valves and fittings.

Base Building drainage will be required to be provided to meet all the drainage needs of the entire RO water assembly.

.11 All drain piping systems will be of the appropriate material for the quality of water discharged and will be sized to handle the maximum flow that would be anticipated from the system.

.12 It is the Owner's intent to re-use RO reject water as possible, to minimize the Facilities consumption of (municipally-treated) potable water. Distribution piping will be designed and labelled as non-potable water piping. Suggested uses for RO reject water include:

Floor drain trap primers;

Dialysis waste drain trap flushing;

c) Cooling tower make-up water; and

.13 Other process water uses (to be reviewed with and confirmed by the Owner).

7.3.8 Medical Gas Systems

Basic Requirements

Medical gas systems will be designed and constructed to CSA Z7396.1 Medical gas pipeline systems - Part 1.

Medical gas systems will include the following oxygen, medical vacuum, medical air, nitrous oxide, nitrogen, carbon dioxide, , and AGSS.

c) Medical gas compressors and vacuum pumps will be located in a designated room. Cylinder reserve capacity for compressor based medical gas systems may be located in the same room as the medical gas source equipment. A separate room will be provided for medical gas cylinders, for cylinder based medical gas systems, with a direct connection to the outdoors.

Provide cylinder medical gas reserve capacity for centralized cylinder manifold supply systems for the following medical gases: oxygen, nitrogen, nitrous oxide, and carbon dioxide based on anticipated usage from the Appendix 2A Clinical Specifications.

Secondary reserve capacity for the oxygen system can be in the form of bulk (liquid) storage in lieu of compressed gas cylinders.

Provide oil-free medical vacuum systems.

g) Provide an active AGSS to serve the entire Facility where anaesthetic gas systems or other volatile anaesthetic agents are used.

h) Provide Diameter Index Safety System (DISS) type outlets for all medical gases. Medical gas outlets within Mental Health areas will have secure covers. Medical gas outlets provided in the sheltered ambulance bays will be concealed in a weather-proof cabinet.

i) Each medical gas outlet will have a permanently marked, colour-coded non-interchangeable index system so as to prevent the connection of the wrong gases. Provide a secondary check valve to hold the line pressure if the primary valve is removed for maintenance.

All medical gas outlets in procedure and patient rooms will be provided with a Patient Reference Grounding system in conformance with the Canadian Electrical Code.

k) All oxygen outlets to be dual-connect style (two ports). Provide an integrated flow meter on one of the two ports.

Medical gas piping will be degreased type 'K' copper.

Provide a compound for the designated bulk oxygen Site to serve the Facility. Coordinate the compound and oxygen bulk tank requirements with the supplier, including dimensions, architectural screening, piping connections, electrical connections, alarm wiring, and safety measures. Locate the compound exterior to the Facility in a location in compliance with the requirements of NFPA that can be accessed by a standard oxygen refueling truck. Provide all piping between the Designated bulk oxygen Site and the Facility including flexible connection at the entry point to the Facility.

Provide an emergency oxygen connection to the Facility, per the requirements of CSA Z7396.1.

Make allowances in the oxygen supply system for a future oxygen concentrator plant installation outdoors near the Loading Dock.

o) Manifolds for nitrogen, nitrous oxide, and carbon dioxide will be sized to hold a minimum of one week's capacity with additional 20% spare capacity in manifold sizing. Design the centralized cylinder manifold supply systems so that they will, when required, automatically switch to the spare bank of cylinders (and that switching to the spare bank is alarmed at the master alarm). Only medical gas piping and valves necessary for the installation of cylinder manifolds will be included in the manifold supply room.

p) Manifold room will have Designated storage space and racking for spare cylinders equal to 72 hours capacity for each system not connected to the manifolds.

q) Include in the Facility adequate space at the Loading Dock for the storage and exchange of medical gas cylinders for helium, mixtures of gases such as oxygen/helium, oxygen/nitrous oxide or other gases as may be required by the Owner. Quantity of each gas will be as determined by the Owner. Provide all racks to secure cylinders. A piping system for these gases not required.

r) Provide new central medical air medical vacuum system. Medical air and medical vacuum systems will each consist of at least three (3) interconnected sources of supply. Systems will be capable of supplying the system flow with any two (2) sources of supply out of service. Provide 'fail-safe' controls: all units will continue to run and maintain service in the event of failure of the electronic controls, without human intervention. Provide multi and/or variable speed systems to allow for varying conditions. Provide for 20% increase in a capacity, including control

panels, for future.

Connect new central medical air and medical vacuum systems to the essential system power supply in conformance with CSA Z32. Provide an essential system power supply from at least two (2) separate circuits such that these essential services are maintained in the event a motor control centre is de-energized.

t) Medical air compressors will be equipped with a carbon monoxide alarm system to measure the level of carbon monoxide in parts per million by volume in the medical air. The system will initiate an alarm and provide a means to prevent gas from entering the piping system if the level exceeds 10 parts per million by volume. Alarm will notify the BMS.

u) Medical air supply systems will be provided with activated carbon final filters on the supply side of the line pressure regulators, per CSA Z7396.1.

v) Where laboratories or any other non-clinical area requires an air or a vacuum system, these systems will be independent from the medical air and medical vacuum systems. Non-medical compressed air systems will include the following:

Laboratory air with N+1 redundancy for non-patient use will be medical air qualityin accordance with CSA Z7396.1-17 and used in such areas as MDRD/Biomed/Pharmacy/Labs/Food Services, and operating door open and door close on sterilizers. Connect to emergency power. System pressure will depend on requirements of final devices and equipment procured. Outlet pressures will be adjustable by the Owner. Laboratory air supply and piping systems will be installed, labelled in the same manner as the instrument air system as described in CSA Z7396.1-17.

Utility compressed air system used in mechanical rooms and maintenance shops for pneumatic tool operation will include reciprocating or rotary screw air compressors, air dryers and receiver tank. Point of use quick connect outlets will include upstream filters and pressure regulators. Depending on the tools used, lubricators may be required.

w) Provide a dedicated active AGSS for all points of anaesthetic gas use and locations where other volatile anaesthetic agents will be used. Gas scavenging systems will be designed to applicable Standards including CSA-Z7396.1. AGSS will include at least three (3) vacuum producers and will be capable of supplying the system Design flow with any two (2) vacuum producers out of service. Vacuum producers will be connected to emergency power. System will have 20% spare capacity to permit future extension.

x) Service isolation valves will be valves of three piece bolted Construction for medical gas service and will have ULC listing and CRN number. Valves will be labelled showing the appropriate gas service & pressure rating. All ball valves will have a quarter turn from closed to open and swing out during installation. Shut off valves exceeding 65mm used for medical vacuum systems may be butterfly valves. Provide degreased copper tube stubs with purge ports.

y) Area zone shut off valves will be housed in a single steel box comprised of multiple shut off valves with tube extensions, removable window incorporating a centre pull out ring. Provide pressure/vacuum gauges for each service. Provide label stating rooms served by valves. Boxes will be Designed so that the shut off valve handles prevent the closure of the box door or replacement of the cover when the valve is in the off position. The boxes will be large enough to permit the manual operation of the shut off valves. The valves will be arranged such that the operation of one

valve will not interfere with the proper operation of other valves located in the same box.

z) Floors will be served from a minimum of three (3) separate sets of medical gas risers. The mains serving these risers will be looped such that either set of risers can feed the floor if one riser is out of service. The loop mains will be provided with service valves so sections of the floor can be isolated without affecting the remaining floor operation.

aa) Provide nitrogen at the necessary supply pressure to Operating Rooms to accommodate the use of speciality tools and the equipment procured.

bb) Medical gas supply equipment for the Operating Rooms, Emergency and Inpatient rooms will be sized to allow for 20% growth in capacity.

cc) Decontamination/soiled medical device reprocessing areas, general laboratories, media preparation and tissue culture labs may require laboratory air or nitrogen. Participants will provide the services required to meet the requirements of the final equipment and devices procured.

dd) Medical gas outlets in Secure Rooms will be behind lockable anti-ligature enclosure(s).

ee) Plume scavenging is to be provided locally, by potable equipment, as required.

Performance Criteria

Provide medical gas outlets in conformance with Appendix 2A Clinical Specifications and meeting the requirements of CSA Z7396.1 and CSA Z9170.1.

Medical Gas System

Provide a zone control valve box complete with zone alarm panel and removable window with pull-out ring at each zone.

Provide a main alarm panel to monitor all the medical gas systems installed in the Facility.

Supply systems will be equipped with alarm sensors as required by CSA Z7396.1. Sensing devices will also initiate audible and visual alarms on the control panels for the medical air compressor system, medical vacuum system, laboratory air system and the AGSS. All alarms will notify the BMS. Auditory alarm signals will be clearly audible and produce a sound level of not less than 70 dBA at a distance of 2 metres and will require manual silencing.

Provide the medical gas system so that there is a minimum of one zone shut off valve per programmed area as well as isolation valves for each patient room.

All piping and components of the pipeline distribution systems which come into contact with the medical gases will be supplied clean and free from oil, grease and particulate material and capped or sealed to prevent contamination. On Site cleaning of medical gas piping will not be permitted.

Provide a local alarm panel for each zone. Alarm panels will be connected to the essential system power supply in conformance with CSA Z32. Provide a master medical gas alarm panel to monitor all medical gas functions. Remote alarm annunciation will be provided at a location with 24 hour continuous monitoring by personnel. Provide an interconnected status and alarm point and signal to the BMS.

All master alarm panels will be individually connected to the BMS. Provide an alarm interface signal to the BMS for critical alarms such as low or high pressure. Master alarms will be connected to the essential system power supply in conformance with CSA Z32.

All medical gas systems will be certified in accordance with CSA Standards and reviewed by an independent and qualified testing agency (provided by the Owner).

All systems components requiring electrical power will be connected to the essential system power supply in conformance with CSA Z32.

x) The medical gas supply system will be for patient consumption only. If equipment and/or procedure(s) require laboratory air, then provide separate dedicated source equipment, piping, valving and monitoring to accommodate that application.

xi) Participants will conduct all installation tests of the medical gas supply systems required by CSA Z7396.1 including leak tests and cross connection tests.

xii) Zone valves will be installed immediately outside each anaesthetizing location.

7.4 Heating, Ventilating and Air Conditioning (Division 23)

7.4.1 General HVAC Requirements

HVAC systems will be Designed, constructed and commissioned to CSA Z317.2.

Room classifications as outlined in Table 1 of Z317.2 (HVAC Design criteria) are identified in the Schedule of Accommodations – Room Classification matrix.

.2 The Facility will be a Class A-2 Health Care Facility (HCF) as defined by CSA Z317.2, with the following variances:

The Perioperative Department will meet the redundancy requirements of a Class A-1 HCF.

Heating and cooling Design:

i) Refer to Section 7.1.3 Sustainability, Resiliency, and Climate Change.

c) Provide a minimum filtration level of MERV 15 (using charged polarized media technology) on all outdoor air intakes with the exception of generator radiator cooling air intakes.

Any ductwork fabricated on-Site during Construction will be constructed within a dedicated room with positive air pressure to ensure no Construction dust outside of the room may contaminate the inside surfaces of ductwork. All completed ductwork is to be sealed with poly before being moved from the room and installed in its final location.

Environmental conditions will be in accordance with Table 1, with the following exceptions:

All Rooms (with RH control requirement):

- Minimum RH 40%

Procedure Rooms:

- Minimum outdoor air changes per hour = 6

- Minimum total air changes per hour = 20

7.4.2 Central Plant for Heating and Cooling

.1 Basic Requirements

The Design and layout of equipment in the mechanical room will allow for a future expansion such that additional plant equipment can be installed without impacting the operation of the plant. Refer to section 7.1.2 Equipment Sizing, Spare Capacity, Redundancy, Flexibility, and Future Considerations.

b) The heating and cooling plant will be Designed, constructed, and operated in conjunction to minimize the overall energy consumption required to satisfy both heating and cooling loads. Refer to section 7.1.3 Sustainability, Resilience, and Climate Change for more details.

Optimize heat recovery from the chiller system such that all the heat extracted from the main chilled water system condenser water can be recovered to provide heat to the Facility and the central plant. Recovered heat uses include all Facility heating, reheat, and domestic hot water preheating. Full or partial heat rejection to the cooling towers will be enabled when the ability to use the recovered heat is reduced or not available.

Cooling plant equipment will be connected to the delayed vital essential electrical system in such a way that critical cooling and 24/7 cooling loads are served at all times.

Design the heat recovery chiller plant to meet the maximum simultaneous Facility heating and cooling demand (including heat extracted by heat recovery coils), as well as being capable of controlling and unloading down to minimum capacity to respond to periods of low usage.

f) Heat recovery chillers to be arranged to extract heat from the main chiller condenser water loop downstream of main chillers. Provide by-pass around main chillers such that the heat recovery chillers can be used to extract heat directly from the Facility chilled water system.

g) Ensure the plant is capable of controlling and responding to periods of low usage/capacity.

Provide means of automatic isolation (2-way control valves) on the inlet of each chiller, boiler, and cooling tower to prevent flow through inactive units.

All refrigerants used will be non-CFC or HFC and be low GWP and ODP.

Chillers

Cooling plant main chillers will be water cooled, high efficiency, electrical chillers utilizing magnetic bearings, rated in accordance with AHRI 550/590. No absorption chillers may be used.

Chillers will have multiple individual refrigerant circuits. Prime mover nameplate ratings for each circuit will not exceed 200 kW for groups Al, A2 or B1 refrigerants.

Chiller control sequences will include chiller staging, chilled water temperature and system differential pressure reset, and variable water flow. Base chilled water temperature and differential pressure reset on tracking position of all control valves (positive feedback).

iv) Chillers will be Designed to operate with variable flow and variable

temperatures, as required to maximum system efficiency.

Provide chilled water pumps with VFDs in a quantity that matches that of the chillers. Interconnect the supply/return mains with isolation valves such that any pump can serve any chiller.

k) Cooling Towers:

Provide multi-cell induced draft cooling towers, with condenser water to cells valved to isolate individual cells while keeping the remainder of the cooling tower operational at full Design capacity.

Locate the cooling towers to ensure cooling tower discharge does not enter the Facility or any other Buildings through air intakes or other openings.

Provide each tower drain pan as all stainless steel Construction, with a ladder and maintenance access platform to service all sides of each tower.

Provide access for personnel to clean out and inspect/maintain basin.

v) Provide a gantry crane or davit arm/s for servicing cooling towers. Gantry cranes will be provided with fixed supporting structure to facilitate servicing each cooling tower. Davit arms will be placed in a functional location to allow swing to a clear access space and will be sized/rated to lift the maximum expected load.

Cooling tower frame/structure will be epoxy coated steel.

Cooling towers will be provided with variable speed drives on all motors.

viii) For winter operation of chillers, sufficient cooling tower capacity in an N+1 arrangement will be winterized, and heat traced. The winterized tower section will be easily isolated from the rest of the array when seasonal equipment is drained.

ix) Provide water treatment packages for the condenser water systems. Provide treatment equipment for introducing corrosion inhibitors and biocides into the cooling towers. Provide packaged high efficiency solids separators.

If utilized Gas-Fired Heating Water Boilers

i) Heating water boilers will be high-efficiency condensing type and configured for dual fuel operation. Boilers will operate on natural gas as the primary fuel and No. 2 fuel oil (heating oil) as the back-up fuel. Condensing mode is not required during operation with No. 2 fuel oil.

Boilers will be forced draft type, fully modulating, low nitrogen oxide (NOx), complete with variable speed burner fan, continuous oxygen trim and utilizing electronic ignition and flame sensing. Boilers will include a control package which will monitor all safety functions and will communicate with the overall process control system.

All flues will be accessible without the need for temporary ladders. Provide fixed structural platform(s) if required.

Provide individual flues for each hot water heating boiler, and generator. Flues will be individually insulated.

Flues will not permit entrainment into Facility air intakes and openings.

m) Wind loading, seismic zone, exposure factor, and deflection will be in accordance with the BCBC.

.2 Performance Criteria

Plant will meet the energy and GHG emissions requirements of the Design Management Plan of Schedule 7.

7.4.3 Hydronic Distribution Systems

Basic Requirements

Hydronic distribution systems will be provided using multiple temperature loops. Heating and cooling equipment will be Designed/selected for temperatures that minimize overall Facility energy consumption.

Design is to consider variable-primary flow Design wherever possible to minimize pumping energy.

Provide adequate expansion compensation for hydronic piping. Locate anchors, guides, and expansion compensation devices or loops based on a thorough review of piping layout and/or engineered piping stress analysis. Provided annotated riser or horizontal diagram showing anchor and guide location, as well as the expected movement of the expansion compensation devices and the load on the anchors(structure).

Provide multiple hydronic piping risers through the Facility. Interconnect the risers on each floor with isolation valves. Arrange the piping and provide sufficient isolation valves on risers and interconnecting pipes such that portions of the risers may be isolated to facilitate repair or future renovations, while not impacting operation of occupied areas.

Once-through (domestic water) cooling is not permitted for any process or service within the Facility, unless required as a back-up cooling system for any equipment. Provide a once-through (domestic water) cooling water system to back-up chilled/condenser water serving MRI equipment.

f) Provide continuously available chilled water and/or condenser water systems for all areas containing specialized medical equipment, communication rooms, elevator machine rooms, server systems and Electrical Rooms for managing continuous internal heat gains. Cooling and heat rejection for these critical cooling loads will be served by the central cooling plant. Design HVAC terminal components in conjunction with equipment location in order to mitigate unnecessary heat gain into the space.

g) Provide continuously available condenser water for the water cooled condensing units for the Food and Nutrition Services department. Make final connections to the condensers. Provide refrigerant piping between the condensers and the respective refrigerator, freezer or cooler, charge with refrigerant and oil and fully commission. Refer to Appendix 2K Food Services.

Provide coalescing type dirt and air separator on the hydronic supply mains leaving the central plant. Provide side stream cartridge filters, chemical pot feeders, and corrosion coupons for all hydronic systems.

Modular expansion tanks are to be provided in accordance with Designed system volumes.

Insulate all hydronic piping, equipment and accessories in accordance with the most stringent of applicable Standards, including NECB, BCICA and ASHRAE standards. Provide a canvas or PVC service jacket on all exposed piping inside;

exterior piping will have aluminum jacketing.

Hydronic piping will be Schedule 40 Steel, Schedule 10 stainless steel (pressed or grooved) or Type L copper. Copper piping for run outs and coil connections will be soldered with lead free or 95/5 solder.

Utilize screw fittings for 50mm piping and smaller and welded fittings for 65mm piping and larger or grooved/mechanical joint (Victaulic) fittings for 12mm (1/2in.) piping and larger.

Provide a glycol snow melt system for the Heliport (pad and ramp).

.2 Performance Criteria

Mechanical/grooved piping joint method by Victaulic is acceptable for all hydronic applications & utility/compressed air.

b) Following are minimum requirements for grooved/mechanical piping installation:

All components will form a complete system by the same manufacturer unless a required product is not manufactured as part of their offering.

All grooved/mechanical joint products to be of a single ISO certified manufacturer, couplings to be installation-ready c/w with pre-lubricated center leg gaskets DN15(NPS ½in.) to DN300(NPS 12in.). For large diameter applications, Couplings to have wide width flush seal gaskets DN350(NPS 14in.) to DN1250(NPS 50in.) with housings that have lead-in chamfer on housing key section to correctly align with wedge-shaped grooves. Couplings must be two symmetrical halves from DN15(NPS ½in.) to DN1250(NPS 50in.) with no other loose parts. Couplings must have bolts of equal length and diameter, and multisegmented (3+) bolt couplings will not be accepted at any size. For ½in. to 2in Sch 10 Stainless pipe. Press stainless steel fittings and valves c/w HNBR gaskets rated to minimum 400psi.

Include gaskets that are engineered, blended, and extruded in-house by the coupling housing manufacturer, assuring system integrity. Include gaskets that feature an integral center leg DN15(NPS ½") to DN300(NPS 12") to ensure correct alignment of the coupling key with the prepared pipe end, wide width flush seal gaskets DN350(NPS 14") to DN1250(NPS 50"), and that are suited for vacuum up to 29.9 in Hg/760 mm Hg. Feature a gasket suited to systems that may cycle within the operating temperature range of –30ºF to +250ºF/–34ºC to +121ºC, for the entire life of the pipe system without the application of supplementary protective lubricants or gasket treatments to achieve this service range.

Be manufactured or produced along with grooved end fittings, valves, strainers, specialties, and accessories at facilities certified under ISO standards. All gaskets, coupling housings, valve bodies and discs shall be dated stamped for quality assurance and traceability. Valves with rubber encapsulated disc or body will not be accepted for use on any hydronic or domestic water pipe systems.

Join pipe ends that are prepared (grooved or pressed) by tooling that is manufactured by the same manufacturer as the mechanical couplings, fitting, valves, and specialties. Must be able to supply correct rolls for material being grooved. Gaskets that require special lubricant to meet performance criteria will not be accepted.

Grooved piping system manufacturer must employ a thermal & stress

analysis piping Designer who is a Professional Engineer registered in the Province of British Columbia to support Design and installation applications. Provide product data points for independent 3rd party to confirm stress analysis if requested. The Participants and grooved piping system manufacturer will ensure all stress, thermal and pressure expansion requirements are calculated and adhered to and will supply an annotated piping layout drawing complete with thermal movement calculations, anchor locations and force loads, and flexible coupling, or expansion joint locations, for review and for coordination with the structural (seismic) engineer.

Feature seismic, vibration attenuation and differential settlement accommodation properties that are validated by industry-recognized 3rd party tests (i.e.: institutional or government testing facilities).

The mechanical couplings, grooved end fittings, valves and accessories will be installed exclusively by installers who have completed a grooved piping system manufacturer certification program within the past 24 months, direct from a ISO certified grooved piping system manufacturer who holds a IACET accredited provider accreditation in good standing and follows the ANSI/IACET standard for continuing education and training.

100% of installed mechanical couplings will be inspected by the grooved piping system manufacturer's inspection services representative. The trained representative will report any deficiency to the Participants, and installing contractor. All identified deficiencies will be resolved prior to commissioning. Manufacturer or Participants may request at their discretion any field grooved and installed joints be disassembled for verification of pipe groove dimensions.

The Participants shall adhere to the inspection services specification of the manufacturer. Inspections must be by a factory trained inspector from an ISO certified grooved piping system manufacturer who holds an IACET accredited provider accreditation in good standing and follows the ANSI/IACET standard for continuing education and training. At Substantial Completion, confirmation and inspection reports are to be submitted indicating that 100% of couplings have been inspected and approved. All test information and data to be provided by the Participants.

xi) Mechanical Plant Design Conditions: All components will form a complete system by the same manufacturer unless a required product is not manufactured as part of their offering, or the Participant elects to select another product which is more appropriate for the required function. Grooved couplings, fittings, balancing, isolation, pressure reducing valves, control valves, check valves, strainers and engineered vibration isolation pump drops shall be the primary construction method for a complete inspected system. For the mechanical rooms/plants the grooved piping system manufacturer or Participants will produce a piping layout model in REVIT to LOD 400 and provide pad and equipment layout, hanger and supports locations, as well as isometric spool drawings to fabrication-level detail. Ensure that all stress, seismic and thermal accommodations have been coordinated with the structural (seismic) engineer such that local codes and Standards are met. The Revit model and fabrication spool maps, along with valve and accessory shop drawings will be provided as part of Hand Over.

7.4.4 Steam Systems

Basic Requirements

Humidity will be provided by steam humidifiers. Stand-alone steam generators are not required for MDRD sterilization. Sterilizers will be electric, not steam-heated.

Steam boilers for humidification will be electric (not gas-fired).

Boilers will include a control package which will monitor all safety functions and will communicate with the overall process control system. Provide both surface and drum blowdown systems and all safety features.

Provide steam separators to achieve ideal dryness on outlet of each boiler.

Provide blowdown collection tank capable of recovering heat back into the boiler feed water.

Provide a main condensate tank with capacity to suit the installed boiler capacity.

g) Condensate transfer pumps will be configured with at least one pump per boiler plus N+1 redundancy.

h) Provide a main deaerator with a capacity to suit the installed boiler capacity.

i) Boiler feed pumps will be configured with at least one pump per boiler plus N+1 redundancy.

j) Pipe the condensate return system such that boiler operation can be maintained if the deaerator is out of service.

Where high pressure condensate accumulates in the plant space, provide flash tank with operating pressure of 35 kPa (5 psi) and recover steam to deaerator.

l) Supply pressure reducing valve stations in a 1/3, 2/3 arrangement when load exceeds 700 kg/hr (1500 pph). For loads below 700 kg/hr (1500 pph), provide full size PRV and globe valve bypass. All PRVs will have isolation valves up and down stream as well as strainers, relief valves, drip-pan elbows and vents to outdoors. Vents of different pressure reliefs will not be combined.

m) PRVs for humidifier operation will be installed locally and provide steam at 70 kPa (10 psi).

Blowdown tank size will be in accordance with National Board of Boiler and Pressure Vessel Inspectors.

o) Provide steam filters and moisture separators at each humidifier as recommended by the manufacturer.

p) Provide connections in the steam system near the point-of-use, which can be used to access the steam for quality measurement.

q) Provide water softener for feed water to steam humidifiers.

Performance Criteria

Ensure the feed water quality to steam generators is within the required conditions of the applicable codes, standards, and manufacturer's recommendations for both the generator and the downstream equipment. Steam quality must be condensate free and minimum 97% saturated vapour.

7.4.5 Fuel Systems

Basic Requirements

Provide back-up fuel storage tanks, with sufficient capacity for 72 hours of operation at the peak Design load.

Selection of back-up fuel (propane or No. 2 fuel oil) to be reviewed and confirmed with the Owner.

Back-up fuel storage for heating water boilers and electrical generators will be separate tanks.

All tanks will be above-ground and located in a protected area (lockable chain-link fence enclosure, or as generator sub-base tanks).

Natural gas and Propane systems:

Systems will be Designed and constructed to CSA B149.1 and CSA B149.2.

Provide new intermediary, let-down pressure station for natural gas to the Facility if required. If natural gas is not required for any equipment on Substantial Completion, include provision for future installation. Future location to be screened from view and secured (fenced compound with pad-locked door).

Provide natural gas supply to all equipment within the Facility as required.

No. 2 fuel oil system:

System will be Designed and constructed to CSA B139 and/or National Fire Code.

Include duplex fuel pump package to supply 1.5X the flow of aggregate boiler/generator demand. Duplex set to be run/ standby with dedicated pump control panels for true redundancy.

Provide anti syphon valve on the supply line from the storage tanks to the fuel supply header.

All storage tank fuel supply lines to be piped into a common header with individual automatic solenoid valves acting as tank selectors. Header to be provided with drain and priming connection.

Duplex pump set to send fuel oil through supply loop disseminating fuel to all boilers in parallel. Provide an oil de-aerator complete with oil filter for each boiler.

Supply back pressure valve at end of supply main to maintain an upstream pressure on the suction of each burner of no more than 20 kPa or the pressure required by the equipment for proper operation.

All excess fuel pumped and returned from boilers will be piped into a common header with individual return lines along with automatic solenoid valves returning fuel to each tank.

Provide fully automated fuel management system with connection to BMS.

Individual fuel fill wall mounted cabinets with overfill alarm and vents will be provided in accessible location for a fuel tanker yet as discreet as possible.

x) Provide fully automated fuel filtration system with connection to BMS for all fuel storage tanks.

.2 Performance Criteria

Allow provisions for future routing of natural gas service for Food Services, for potential future connection of gas-fired kitchen equipment.

Provide minimum 2 X 20 US gallon propane bottles with regulators and protective cage to feed pilots and facilitate fuel oil ignition. Plumb to respective appliances as per manufacturer's requirements. Provide additional bottles or capacity if required.

7.4.6 Space Heating and Cooling

.1 Basic Requirements

a) HVAC systems for cooling of Communication Rooms (PER, SER, Communications Room) and Electrical Rooms will be N+N redundancy. This includes all equipment (CRAC units, fan coils, etc.) and supporting mechanical (piping, ductwork and controls).

Cooling terminal units will be located outside of all Communications Rooms. Ducting to/from the room is acceptable.

No plumbing (open or closed) or mechanical piping is to be located in any Communication Room.

The Participants are to consider decoupling the space heating and cooling equipment from the ventilation equipment for the Med/Surg Inpatient rooms (IPU tower block). The air system would be used for ventilation and humidity control, and a hydronic system (such as radiant heating/cooling) would be used for space temperature control.

Space heating for the decontamination area will be by radiant means to ensure minimal air velocity within the space.

.2 Performance Criteria

Ensure that no air within the air conditioning system, outside of the central air handling equipment, drops below its dew point temperature.

7.4.7 Ventilation

Basic Requirements

Provide HVAC systems that maintain appropriate pressure relationships between various areas of the Facility and provide necessary outdoor air changes, total air changes, air filtration, air cleansing, humidification/dehumidification and exhaust to control the transmission of infection.

b) Include SMACNA recommended duct leakage rates for sizing air systems.

Design the air handling equipment for the Facility to provide 100% outdoor air capability at all times of the year. Requirement for 100% outside air includes operation during fire mode smoke control sequences and an internal catastrophic event.

Provide motorized ultra low leakage dampers and guillotine-style manual dampers at all points of equipment isolation and interconnected ductwork. Provide airflow

sensor at damper to ensure isolation has been achieved.

Provide fans with Variable Frequency Drives (VFDs) for part-load conditions.

Participants are to demonstrate a computerized harmonics analysis of the Facility electrical system based on the final single line diagram. Analysis will illustrate the effect of all VFDs (including pump VFDs) on system harmonics. Participants are to provide input line reactors and/or line filters required to reduce the total harmonic distortion (THD) at the point of common coupling or at each VFD input where the analysis has shown that the incremental effect of the addition of the VFD's would cause the THD to exceed these values as per IEEE 519 latest edition standard.

g) Provide factory-fabricated air handling equipment to ensure the highest Construction standard.

Air handling units will have double-walled Construction with minimum 50mm thick insulation, galvanized steel exterior, stainless steel or painted aluminum interior.

Air handling unit floors will be reinforced minimum 3mm aluminum or 14 ga stainless steel checker plate with continuously welded seams. Base will be structural steel minimum 150mm C-channel around perimeter.

Interior surfaces of air handling units will be light in colour, washable, smooth, non-porous and free of obstructions which may impede airflow or the ability to thoroughly clean the unit.

There will be no standing water in air handling units. Install leak-proof drain pans with continuously welded seams and corners. Drain pans will be 16 ga type 304 stainless steel, double sloped to drain. Drain size minimum 32mm (1-1/4").

The air handling unit will have a 40mm perimeter collar around the entire unit and around each floor opening to ensure the unit is internally watertight. Each section of the air handling unit will have a capped and threaded drain connection.

vi) In addition to the air filtration required by CSA Z317.2 and this Schedule (7.4.1), provide air handling units with a 100mm wide carbon filter rack. Carbon filters will not shed dust and in turn will require no post filter. Carbon filter pressure drop will not exceed 125Pa at 2 m/s.

The controls contractor will provide associated monitoring and controls for connection to the BMS.

Provide an exhaust air system suitable for the Laboratory requirements and any other special venting requirements as per CSA Standards. These systems will be interlocked with the supply air systems. If system serves more than one piece of equipment, provide N+1 redundancy in fans. Laboratory ventilation systems will supply sufficient make-up air for exhaust systems to maintain proper pressurization throughout the Facility.

Provide vandal-proof, anti-ligature HVAC equipment and devices in patient Bedrooms, Secure Rooms, and other areas where psychiatric patients may be present and unsupervised.

i) Provide dedicated room temperature control for the Secure Room. The

temperature controller is to be installed outside of the Secure Room in the Workstation-Care Team and will be controlled by nursing staff.

Provide all ventilation for the Food Services department including NFPA exhaust hoods for the cooking equipment and condensate canopies over the dishwashers.

k) Provide ventilation systems for the mechanical room(s) as follows:

Boiler room combustion air and room ventilation system;

Chiller room ventilation and exhaust system;

Control room and staff area heating, cooling and ventilation;

iv) Water entry room heating and ventilation;

v) Electrical Room ventilation and cooling.

l) Provide a variable air volume makeup air unit to heat the makeup air exhausted by the fans. Provide an offset between supply and exhaust to keep the garage negatively pressurized relative to the rest of the Facility.

Provide ventilation for smudging as follows:

For rooms where smudging will occur, provide a dedicated exhaust system for use during the smudge and for a period of time after the smudge has ended to ensure that the room has been purged of smoke. When these rooms are being used for smudging, the air will not be returned to the central system. When the rooms are not being used for smudging, the air supplied may be returned. The rooms will be negatively pressurized relative to the rest of the Facility.

Provide automated controls established within the BMS for HVAC, fire alarm and suppression systems to facilitate the smudge ceremony within the identified room(s).

Ventilation systems serving Pharmacy spaces will be designed to comply with the most current version of NAPRA Standards for Pharmacy Compounding of Non-Hazardous Sterile Preparations. Air handling unit systems serving each Pharmacy space will comply with all required testing and certification requirements.

o) Provide ventilation for workshops to suit woodworking, spray painting, acetylene torch cutting and brazing and welding. Ventilation systems to incorporate dust collectors, spray booths and close capture systems.

p) Provide an air quality monitoring system.

System to measure the following:

- CO2
- VOC
- Particulate matter (PM2.5)

ii) System to measure indoor air conditions in Emergency Department waiting room, and L1 (ground floor) elevator lobby in the IPU block.

q) Provide air curtains with filtration at each major entrance to the Facility and ensure a slight positive Building pressure to limit the ingress of unfiltered outdoor air.

.2 Performance Criteria

Allow for the installation and removal of major HVAC equipment such as fans

without disrupting Facility operations.

Locate fans, filter banks, and other equipment in central mechanical rooms. Allow for adequate clearance for service access. Do not place this equipment in confined spaces.

Provide bag in – bag out HEPA filters with bubble tight dampers as per CSA Z317.2 and 100% redundancy for exhaust systems serving Airborne Isolation Rooms and their associated washrooms. Filter system will be Designed so that filters can be replaced without impacting the operation of the rooms served by the system.

d) Where unavoidable, all equipment for supply air, return air and general exhaust systems that will be located exterior to the Facility will be Designed and constructed to withstand the exposure to outdoor conditions.

All supply air return air and general exhaust air systems will be accessible for routine maintenance without exposure to the elements/outdoors.

f) Provide fresh air intakes, cooling coil drain pans, air handling units, ductwork, and all other interconnected components to prevent moisture or contaminants from collecting within the system. Provide sufficient access panels to allow for inspection and cleaning. Do not use duct mounted humidifiers.

Locate fresh air intakes so as not to entrain contaminants from outdoor sources, including existing exhaust points of adjacent Buildings, Facility exhaust points, or parking areas. Locate all intakes in areas that are not accessible by the public and are not near exhaust air outlets. Take into account the location of the emergency generator exhaust and ensure that fumes from the generator exhaust are not introduced into the Facility or adjacent Buildings' fresh air intakes.

Ensure all supply, return, and exhaust air is fully ducted to the space being served. Ceiling area will not be used as return air plenums. Door grilles are only permitted for non-medical storage and service rooms without a Fire-Rating. Utilizing door undercuts or door leakage to transfer air for rooms with greater than 45 l/s (95 cfm) air change requirements or located within a fire separation are not permitted.

Locate services that require access for regular maintenance above non-critical spaces so that there is minimal disruption to the delivery of health care services. VAV boxes and any associated re-heat coils serving individual inpatient rooms located on the patient care floors in the Facility must be located in the ceiling of the corridor.

Insulate all ductwork to all applicable standards as a minimum. Insulate all exposed to outside air exhaust ducts from connection to the exhaust equipment up to termination point on roof or outside walls. Provide canvas service jacket on all exposed insulation inside and up to 3 meters above finished floor in mechanical rooms.

No in-slab or under slab-on-grade ductwork is permitted.

For all rooms with a high-level of air separation requirement, as outlined in CSA Z317.2 and Appendix 2A Clinical Specifications, locate supply air diffusers and exhaust air grilles to minimize the exposure of uninfected occupants in the space. Utilize directional airflow principles. Provide differential pressure monitors at isolation rooms to monitor and to ensure proper pressurization has been achieved as required. Incorporate door contact switches for all differential pressure monitors to prevent nuisance alarming;

m) Ensure all ductwork that provides humid air is constructed of welded stainless steel of a suitable alloy or of a material equally resilient to corrosion. Ensure all

ducts are sloped to drain points and are accessible for inspection and cleaning.

HVAC systems for Communications rooms including Entrance Facility Room, Main Electrical Room and Tech Room will condition the spaces to meet temperature and relative humidity requirements as per the most restrictive of ASHRAE 2015 Environmental Guidelines for Datacom Equipment, TIA-942-A-2012, or the following:

Temperature: 22°C [72°F] dry bulb, controlling to room average temperature at/near the return air grille;

ii) Maximum relative humidity: 60%;

Maximum dew point: 15°C [59°F]; and

iv) Maximum rate of temperature change: 5°C [9°F] per hour.

o) Solutions with directional airflow that reduce infections through airborne pathways such as displacement ventilation is an acceptable solution for the Med/Surg Inpatient Rooms.

p) Mechanical air intakes located within vicinity (min 100m) of the heliport will be controlled to close during the times when a helicopter is present. The ventilation/AHU system(s) will operate in re-circulation mode during this mode. This mode will be initiated via interlock with helicopter approach, same as the fuel containment system initiation. This mode will revert to normal operation 15 minutes after the departure of the helicopter.

7.4.8 Exhaust Systems

Basic Requirements

a) Design exhaust air discharges to ensure that there is no cross contamination with outdoor air intakes, operable windows, or any other air intakes on the Facility.

Provide exhaust fans and locate them at the end of the exhaust ductwork systems. Ensure that the fans will be readily serviceable. Provide welded pressure ductwork after isolation and other contaminated exhaust fans to the Facility exterior.

c) Integrate control of the exhaust systems with the ventilation supply air systems for spaces with differential pressure requirements from adjacent spaces.

Provide a heat recovery system on all Facility exhaust and relief air systems (other than highly contaminated exhaust). Heat recovery systems will include a bypass for heat recovery coils and air filters for use when there is no demand for heat to avoid wasting fan power.

Provide exhaust air systems suitable for special venting requirements. Interlock these systems with associated supply air systems.

Provide commercial-grade NFPA-96 exhaust hood systems where commercial cooking operations will occur. Interlock the hood(s) with a make-up air system to ensure proper pressurization within the Facility is maintained.

g) Kitchen range/exhaust hoods to incorporate sensors to allow for reduced airflow volume when possible.

h) Provide refrigerant detection and exhaust system.

i) In addition to the cooling requirements called for in previous clauses, provide exhaust for elevator machine rooms and/or elevator shafts.

Provide a radon gas mitigation system.

Provide local exhaust within vicinity of all sanitary sumps within the Facility.

l) Provide local exhaust within vicinity of all plaster traps within the Facility.

.2 Performance Criteria

Isolation rooms and their associated washrooms and the Decontamination unit will be provided with dedicated exhaust systems with 100% redundancy. HEPA filters will be provided in the Airborne Isolation Room exhaust ductwork in readily accessible locations for servicing.

Biosafety cabinets, laminar flow cabinets, fume hoods, chemical storage cabinets, grossing tables/specimen mounting tables and downdraft tables will be provided with dedicated exhaust systems that are appropriate for their CSA class and type. Provide canopies connected to the general exhaust system for ovens, autoclaves and other heat emitting equipment belonging to the Owner. Where multiple cabinets are tied into a common system, a 100% redundant central exhaust system will be provided. Specimen mounting tables and grossing tables will be equipped with counter top level exhaust. Provide a close capture exhaust arm for the biomedical workbench. Review Appendix 2A Clinical Specifications to ensure that all equipment, rough in for equipment and support systems have been accounted for and provided. Allow for ducting, commissioning, testing, and balancing the exhaust from all biosafety cabinets, fume hoods, chemical storage cabinets, grossing workstations and laminar flow cabinets. Include face velocity, containment and any other testing for fume hoods as required by WorkSafe BC.

Not used.

d) Provide dedicated exhaust systems as required for medical equipment. Do not use portable systems.

Ensure all ductwork that exhausts humid air at or near saturation (ex kitchen range hood exhausts, dishwasher exhaust, cart washer exhaust, etc.) is constructed of welded stainless steel of a suitable alloy or of a material equally resilient to corrosion. Ensure all ducts are sloped to drain points and are accessible for inspection and cleaning. Provide all recovery coils with drain pans and properly sloped drains.

Provide a permanent negative air exhaust duct system throughout the Facility to allow portable negative air HEPA units to connect to during any future renovation. Provide redundant (N+1) exhaust fans with VFD drives at the termination of the duct. Loop branch ducts on each floor such that all areas can be reached within 30m. Provide capped 300mmØ duct tee's complete with balance dampers and capped ports for pitot tubes for confirming airflow. Space tees at 30m intervals.

The following 50 pages have been redacted in their entirety

7.6 Electrical (Division 26)

7.6.1 Design Principles

This section is accompanied and will be read in conjunction with all the Appendices.

.2 Provide electrical systems that provide redundancy, protection, high continuity of service and a comfortable and safe working environment for patients, visitors and staff.

All electrical systems, materials and equipment will be new and of a type and quality intended for use in an acute care health care Facility.

.4 Electrical systems shall be Designed and selected with priority given to total life cycle cost and not solely reducing the initial capital cost.

Electrical systems shall perform at a level of reliability and suitability for purpose as deemed acceptable by the Owner.

.6 Redundancy will be incorporated into systems and equipment such that the failure of a single piece of major equipment or major conductor will not impair the operation of the Facility or leave any room without at least one active light and one active receptacle unless stated otherwise.

.7 Provide systems and equipment which are coordinated with other Facility systems to support service continuity and redundancy requirements of the mechanical, Building, communication, security and clinical systems.

Provide, configure and commission electrical systems to meet requirements of the identified program and patient care needs in an efficient manner with optimal utilization of space, staff and equipment resources.

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 interruption to the regular Facility activities.

The electrical installation will not encumber access to Building elements, equipment, systems or areas which require periodic inspection or maintenance.

.11 Electrical systems shall be of the latest proven technology. Where requested Participants shall provide evidence, including demonstrations that the proposed systems and equipment perform at an acceptable level at comparable healthcare facilities.

.12 All electrical, communication, security, medical and life safety systems will be fully compatible with existing Owner regional-based systems. Provide all infrastructure, interfaces, modifications, programming, testing and commissioning to local and off-Site systems to ensure that there is seamless integration with remote facilities.

.13 Integrate systems where integration provides efficiency, operational and cost advantage. Avoid unnecessarily complex system integrations which reduce system reliability and impede troubleshooting and routine maintenance.

.14 Participants will submit the proposed classification of all patient care areas in the Facility as per CSA Z32. The Owner will review these classifications and confirm the areas as Basic, Intermediate or Critical Care.

.15 Provide power distribution systems for the following utilization voltages:

25 kV, 3 phase utility services;

c) 4.16kV or higher, 3 phase, for high voltage distribution within the Facility and for future remote Building expansion / Site development;

600V, 3-phase, 3 wire derived from high-resistance grounded system for large equipment and distribution within the Facility and for select future Site development;

480V/277V, 3 phase, 4 wire for specialised equipment (e.g. medical imaging);

f) 208/120V, 3 phase, 4 wire for distribution to branch circuit panels for lighting, receptacles, and equipment loads.

.16 Incorporate energy management systems to monitor demand on the Facility electrical systems.

.17 Not Used

.18 The adverse impact of EMI is to be considered in installation of electrical equipment. Limit the strength of Electromagnetic Fields to acceptable levels.

.19 Size and configure equipment to permit routine testing and servicing of power generation and distribution equipment with minimal loss of service continuity.

7.6.2 Provisions for Future

Design and construct the 25kV system with adequate capacity to accommodate a 100% increase in electrical demand.

Provide one spare, medium voltage, 2-high, circuit breaker section and space for one, medium voltage, 2-high, circuit breaker section for each of the Normal, Vital and Delayed Vital and Conditional distribution branches. Each spare and space/future circuit breaker sections shall be made ready to accept two future circuit breakers. Provide each spare and space/future circuit breaker with a suitable unused concrete encased duct, extending beyond the Services Centre perimeter to manholes for future use. Provide one spare medium voltage circuit breaker, suitable for use in any of the spare or future circuit breaker sections.

All spare high voltage circuit breakers sections shall be provided with spare underground ducts to extend new feeders beyond the Services Centre footprint to facilitate future Site development. Coordinate the location of these services with the Owner.

.4 Provide space, ducts and footprint for a fourth emergency generator such that it can be added to the synchronising bus to supplement the capacity and redundancy of the emergency power system.

In addition to other provisions identified in this Schedule, and based on the calculated peak load, provide 25% spare capacity in the sizing of:

Each 25kV-600V step down transformer based on its Air Natural Convection Cooling rating (ANN);

Each 600V-208/120V step-down transformer;

Each 600V switchgear section;

Each 600V distribution panel;

e) Not Used

f) Each Motor Control Centre;

g) Each 208V Distribution Panel;

h) Each 120/208V lighting/receptacle panel;

Each feeder;

j) Each electrical shaft;

.6 Provide sufficient spare electrical capacity and conduit routes to accommodate a 50% increase in load from the Services Centre mechanical systems.

.7 Provide sufficient spare capacity and conduit routes to accommodate a 50% increase in load from the SR.

.8 Where electrical sleeves are grouped provide an additional quantity of 25% empty sleeves for future (rounded up to next whole number).

.9 The 25% spare capacity will be in addition to the calculated demand or demand allowance required by this Schedule, operating factors and safety factors. For example if a 100A, 80% rated circuit breaker is provided the load capability is 80A, and to meet the 25% spare capacity the system must be Designed so the circuit breaker has a

maximum load of 64A. Submit load calculations to demonstrate spare capacity provided for each equipment of the types noted above.

.10 In each electrical riser room provide clear physical space that will allow the following additional equipment to be installed in the future:

One 150kVA, 600-208/120V transformer;

One 400A, 208/120V CDP;

One 225A, 208/120V, 72 circuit panelboard.

.11 Provide adequate physical space to facilitate the future installation of feeders which will utilise the spare electrical capacity. Space provided will allow the installation of future feeders without disruption to the Facility. This includes riser shafts, main conduit runs and cable pullpits.

.12 At each switchgear line-up, distribution panel and lighting/receptacle panelboard:

Provide spare breakers equivalent to 10% of the total number of utilized breakers. Rating and features of the spare breaker(s) will match the most common breakers installed in the panel;

Provide prepared spaces equivalent to 15% of the total number of utilized breakers as fully prepared space(s). Each prepared space will include all of the hardware and connectors necessary to add a circuit breaker into the panel in the future;

.13 When calculating the spares/spaces in the clauses above round up to the next whole number. For example, a panel utilizing 22 feeder breakers will also contain a minimum of 3 spares and 4 prepared spaces.

.14 Spare circuit breakers below 150AT will be provided with interchangeable trip plugs. Spare circuit breakers greater than 150AT will be provided with LSI trip units, suitable for adjustment of long time trip setting as required.

.15 Make allowances for the required quantity and size of conduits necessary to fully utilise all spare circuit breakers.

.16 Include for additional future provisions noted elsewhere in this document.

7.6.3 Post-Disaster Design Criteria

Design the electrical systems and equipment to meet or exceed the BC Building Code requirements for a post-disaster Facility.

Design the electrical systems and equipment to comply with the following requirements:

Electrical Rooms shall be installed at or above grade.

All rooms containing electrical distribution equipment ('Electrical Rooms') shall be classified as 'Service Rooms' per BC Building Code and constructed accordingly.

Drains shall be installed in Electrical Rooms. All electrical equipment shall be located a minimum of 100mm clear of finished floor height, either by means of wall mounting of equipment or by provision of housekeeping pads.

Feeders shall not be routed through Boiler Rooms or other hazardous spaces areas unless they are serving equipment within those areas.

Except where installed in separate ducts in a common ductbank, Vital power feeders shall not be co-located with other feeders in the same cable tray, conduit rack or riser shaft unless physically separated by a distance of no less than 3

metres.

Provide flexible raceways for feeders which span seismic joints, capable of 150mm deflection on three axes.

g) The following equipment will be Designed, certified and installed in accordance with the International Building Code (IBC) chapters 16 and 17 and tested in accordance with the shake table testing standard ICC-ES AC-156:

Emergency power generators, paralleling switchgear and controls;

Not Used

UPS systems including batteries;

Main distribution boards (High voltage, 600V and 208V boards greater than 400A);

Generator system transformers;

Distribution transformers 112.5kVA and larger.

Emergency Operation Centre (EOC)

Provide all electrical, communication and security services and equipment required to support the EOC, per Section 5.3.

50% of all EOC receptacles and lighting will be connected to Vital power;

50% of all EOC receptacles and lighting will be connected to UPS power;

Six workstations will each have:

- 4 power outlets (2 on Vital, 2 on UPS)

v) The Communication Equipment Room will have two workstations; each workstation will have:

- 4 power outlets (2 on Vital, 2 on UPS)

i) Provide electrical services to an emergency kiosk as follows:

400A Vital power feeder supplying a 400A, 120/208V, 3P, 4W panelboard. Panelboard will have 4 x 100A, 3P circuit breakers and 12 x 15A, 1P circuit breakers;

Extend wiring from the 100A circuit breakers to junction boxes mounted adjacent to the panelboard. These will provide a means for connecting cab-tyre type cable connections to remote equipment;

Provide six 15A, 120V split-duplex receptacles in the kiosk, each supplied with dedicated circuits from the kiosk panelboard; and

j) Kiosk shall have the following features:

Heating and ventilation to maintain maximum temperature and avoid condensation; and

Powder coated fabrication for rust resistance.

k) Provide rough-in (raceway and junction box only) for Conditional power to serve a future Level 3 EV charger station in the sheltered ambulance bays.

l) Sheltered ambulance bays, as follows:

Provide four wall-mounted enclosures (one in each corner) in the sheltered ambulance bays for use in a mass casualty or decontamination scenario. Coordinate with mechanical for the co-location of the medical gas outlets in each enclosure.

Each enclosure shall contain six 15A, 120V receptacles each with a dedicated Vital circuit plus 8 data drops.

Provide a radio repeater for the BCEHS radio system to ensure high signal strength for ambulance staff radios.

iv) Provide retractable, ceiling mounted-cords on each bay to enable ambulances to be connected to building power. Exact power requirements to be confirmed by Owner.

Provide illumination levels for sheltered ambulance bay per CSA Z317.5.

7.6.4 Seismic Requirements for Electrical Systems

Basic Requirements:

Provide seismic restraint for all electrical equipment and components of electrical systems suitable for a post-disaster Facility.

b) Provide seismic restraint systems and methods that facilitate ease of maintenance and ease of replacement and reconfiguration of electrical equipment and systems and other equipment and Building components.

Provide seismic restraint systems and methods that coordinate with the Facility's architecture and finishes. Wherever practicable, conceal components of seismic restraints from public view. Where concealment is not practicable, provide systems that complement the Facility's architecture and finishes.

.2 Performance Criteria

Provide seismic support for all electrical equipment and components of electrical systems that have the potential to cause injury or damage during or following a seismic event.

Use seismic restraint systems that are Designed by a professional engineer, registered in British Columbia, or, where an identified pre-Designed standard restraint device or system exists for a particular item, that equipment may be used provided that written confirmation of its acceptability for the installation is provided by a professional engineer registered in British Columbia. This Seismic Engineer will cover off all seismic requirements within this schedule. Provide signed and sealed drawings as well as typewritten field reports from a professional seismic engineer, registered in British Columbia. Obtain certification of the main electrical distribution equipment for "seismic withstand capability" and, to maintain the certification, anchor such equipment according to the manufacturer's instructions.

7.6.5 Power Quality

Basic Requirements

Establish and maintain an overall power quality which assures suitable conditions for operation of all electrical and electronic equipment throughout the Facility.

Provide equipment and systems which assure that electrical equipment and systems will not be harmed or impaired either by external events or conditions,

such as lightning and disturbances on the utility service, or by internal events or conditions generated within the Facility.

Meet or exceed relevant Standards for power quality where deemed necessary by the Owner's operational requirements, BC Hydro and IEEE.

Comply with all BC Hydro requirements for connection to the utility.

Provide harmonic mitigation equipment, as necessary, to ensure that power quality meets the recommendations in IEEE including standard 519. For the purposes of measuring the harmonic distortion, the "Point of Common Coupling" will be either of the main transformers. As part of commissioning, confirm compliance to applicable reference tables by field measurements after Building occupancy and under normal operating conditions.

.2 Performance Criteria

Provide power factor correction equipment within the Building to ensure the Building power factor remains between 0.95 lag and 1. Coordinate capacitors with adjustable frequency drives and other harmonic generating equipment to avoid resonance conditions.

Provide equipment, such as filters and Surge Protection Devices (SPD's), specifically Designed to mitigate adverse power quality conditions that could damage or impair function of sensitive electronic equipment used in the Facility. Adverse power quality conditions include voltage spikes, dips and droops, transients, harmonics, power factor and radio frequency interference.

c) Provide the ability to demonstrate to the Owner at any time that there are no potentially harmful power conditions present and that equipment intended to guard against such conditions is in proper working order.

The voltage phase imbalance (as defined by NEMA) shall not exceed 1% anywhere within the power distribution system.

Provide integral surge protective devices (SPD's) on all 600V switchgear in the main Electrical Room rated 800A or larger. SPD's shall be rated for lightning strikes on incoming utility services or the Facility itself. SPD's shall be monitored by the Building Management System (BMS) for failure conditions.

Provide integral surge protective devices (SPD's) on all CDP's serving medical imaging equipment. SPD's shall be monitored by the Building Management System (BMS) for failure conditions.

g) Provide individual harmonic filters ahead of and coordinated with variable speed drive for every motor greater than 7.5 HP.

Provide a third party specializing in power quality systems to fully test and commission all power quality systems. Submit the reports with the commissioning documents.

7.6.6 Electrical Distribution Protection and Coordination

All protective devices in the electrical distribution system will be fully rated for the available fault current under all conditions. Series rating of equipment is not acceptable.

Provide suitably rated equipment with protection and control equipment configured to achieve selective tripping under any fault condition for the available short-circuit currents in the following scenarios:

When the electric utility service is supplying the loads;

When emergency generators are supplying the loads;

When both electric utility service and generators are paralleled and supplying the loads.

Transfer switches/Transfer Mechanism provided with minimum WCR Time Based duration of 0.5 seconds. Transfer switch/Transfer Mechanism WCR ratings shall be coordinated with upstream devices such that a fault downstream of a transfer switch will always clear before operation of the transfer switch devices or the upstream protective devices.

.4 The emergency power system shall automatically perform load shedding and load prioritisation based upon availability of emergency power capacity.

.5 Load bank breakers shall automatically disconnect from the system upon loss of utility supply to the Facility.

Coordinate with BC Hydro to ensure selectivity is achieved on both Utility services to the Site. Provide all required metering and protection to conform with BC Hydro requirements for a high voltage closed-transition transfer scheme.

.7 Perform a protection and coordination study prior to selection of components. Study shall be reviewed and sealed by a P.Eng. Submit for review and approval by the Utility provider. The study shall include a minimum of the following:

Selective coordination with the Utility fuses/breakers;

Selectivity of the high voltage distribution equipment;

c) Compliance with the Utility requirements for closed transition transfer schemes;

Selective coordination of generator breakers;

Selective coordination of transfer switches and upstream devices;

Selective coordination of the fire pump feeders and transfer switch;

g) Acceptable device settings for all transformer inrush currents;

h) Acceptable device settings for motor starting of largest motor on each distribution;

Selective coordination of all distribution branches from the source of power to (and including) the feeder breaker supplying the final panelboard. The instantaneous regions of 208V moulded case breakers smaller than 800A are exempt from selectivity requirements.

7.6.7 Arc Flash Hazard Reduction

Incorporate Design features to reduce arc flash hazards on electrical systems such that routine operations such as transfer switch operation, opening and closing distribution breakers, and inspection and maintenance activities will require (as defined in NFPA 70E and CSA Z462) a maximum of PPE Level 2. No activities will expose personnel to arc flash hazards that exceed the protection afforded by PPE Level 4.

Utilise technologies such as bus differential protection, arc flash protection relays, zone selective interlocking protection, limiting available fault current from transformers, maintenance mode settings of circuit breakers, and providing remote control of switching and motorised racking devices.

Submit to the Owner's operating staff a detailed arc flash study (IEEE 1584 / CSA Z462) signed and sealed by a Professional Engineer.

In accordance with the approved arc-flash study, provide equipment labelling indicating available energy levels and level of PPE required when servicing the equipment. Persons who will be producing and/or installing arc flash and shock warning labels will consult ANSI Z535.4, CAN/CSA-Z431, and CSA Z321 to ensure that all applicable requirements are met.

7.6.8 Switchgear – Over 600 Volts

Basic Requirements

Provide rackable rated metal-clad switchgear with vacuum circuit breakers, potential transformers, current transformers and metering sections for the Services Centre switchgear and Facility switchgear.

b) Utilize distribution equipment that is robust, reliable, easily operated, and maintained.

Performance Criteria

All switchgear will be provided with copper busses.

b) Not used.

Provide integration with the Facility's BMS to indicate status of each breaker.

Provide circuit breaker auxiliary contacts and supervise these with the BMS to indicate operational status of each breaker (open, closed, tripped, racked out).

Provide a coloured lamicoid mimic bus single line diagram on the front of all switchgear. Switchgear will have coloured engraved lamicoid nameplates for cubicle and circuit identification on front and rear sections. Labels shall comply with the Owner's electrical Standards.

7.6.9 Electrical Utilities

Basic Requirements

Coordinate and comply with BC Hydro to service the Facility with two independent 25kV Utility services. These services will be redundant and will be supplied from separate circuits at the nearest substation.

Participants to coordinate with the utility provider and pay all associated costs required to extend the BC Hydro 25kV services to the Site.

Participants will comply with all applicable BC Hydro Standards, including "Interconnection Requirements for Closed Transition Transfer of Standby Generators".

Participants will comply with all applicable BC Hydro Standards and documentation requirements relating to interconnection of large (i.e. greater than 100kW) photovoltaic systems. Utilize transmission and distribution equipment that are robust, reliable, easily operated and maintained.

.2 Performance Criteria

The new BC Hydro utility services will terminate outside of the Services Centre.

b) Locate the distribution poles, service dips, ductbanks such that risk from traffic and other hazards is minimised.

c) Do not locate incoming Utility service ductbanks below any Building footings or major equipment, except for the Services Centre.

Dual redundant utility services to the Facility will be supplied via a single steel-reinforced concrete ductbank located along the west side of Bell McKinnon Road and south side of Hospital Road North. Services will terminate at a Vista switch at the property perimeter. A single ductbank will route the incoming utility service from the Vista switch to the Owner's main incoming switchgear.

All ductbanks (including non-BC Hydro ductbanks) shall be reinforced concrete-encased type and be readily identifiable by means of ferrous marking tape.

Provide all metering and protection necessary to comply with BC Hydro's requirements for the Site's closed-transition transfer schemes.

g) The Utility Incoming Switchgear will be metal-clad type rated for 600A comprising of:

a load-break switch;

ii) a dedicated compartment for utility metering instrument transformers;

A draw-out vacuum circuit breaker main breaker;

Two draw-out vacuum circuit breakers at feeder positions;

3-phase digital multi-function type protective relay at the main and feed breakers with ANSI protective functions 50/51, 50N/51N, 86, 47 and additional protective functions as required; integral digital metering capable of displaying V, A, KVA, KW and harmonic parameters; and a communication port integrated with the BMS to indicate status of the main;

Differential protection for the Utility Incoming Switchgear between the incoming service feeder and outgoing feeders to reduce the arc-flash hazard.

h) Provide station class lighting arrestors on each incoming utility service.

7.6.10 Emergency Power System

Basic Requirements

Provide a centralised Emergency power generating plant comprising of a minimum of three diesel engine high voltage generators. Generators will be located in the Services Centre at grade level.

Provide physical space, conduit rough-in, switchgear capacity and control system capability for the future addition of a fourth generator.

c) Generators shall be located where they are not subject to damage from vandalism, falling objects or debris, road traffic, fire, flood or adverse weather conditions.

Provide an environmental study of the Site's prevailing winds. Locate the generators and Design the system such that exhaust fumes and noise from the generators shall not cause objectional odours, fumes, smoke or noise to the Facility or neighbouring properties.

Locate generators to enable routine and emergency maintenance activities to be performed quickly and efficiently. Removal of the generators from the Facility will be simple and shall not require disassembly of the Facility's Buildings or systems, nor special lifting equipment which is not readily available on Vancouver Island (i.e. can reasonably be assumed to be at the Facility within 24 hours).

f) Generators will be supplied by an established supplier of large generator systems to healthcare facilities in British Columbia. The generator supplier will have a full

service repair Facility within 8 hours travel time (by road) to the Site. Generator spares will be routinely stocked within the British Columbia Lower Mainland and will be available on Site within 24 hours.

The generators will synchronise and operate in parallel as an integrated, unified system.

The Emergency power system will perform bumpless (closed-transition) transfer operation. It will also be capable of load sequencing, selective load shedding, and base loading. It will be possible to use the Facility load as a base load for annual load testing of the generators.

i) Automatic startup and acceptance of load shall comply with CSA Z32.

j) Conditional loads shall transfer to the Emergency power system within 120 seconds of loss of Utility power.

k) The Emergency power system shall enable the Owner's maintenance staff to perform automatic routine testing of the generator and transfer switches.

l) The Emergency power system shall be highly redundant with no single point of failure. All critical components will be fully supervised for early detection and alerting of trouble conditions.

The generators and the generator control system shall be provided as an integrated package from a single supplier.

n) Manufacturer supplied wiring diagrams for the installation, testing and commissioning of generators shall be provided to ensure complete emergency generation system compatibility.

.2 Performance Criteria

a) The Emergency power system shall include prime power rated, high voltage Emergency power generators of equal capacity.

Upon loss of any one of the three generators, the Emergency power system shall be capable of supplying power to all of the Site's Essential power system loads including:

100% of the Vital, Delayed Vital and Conditional branches;

100% of all cooling and heating loads at peak demand;

All UPS loads;

iv) The Facility fire pump;

v) All equipment associated with the EOC, PER, SER, TR's and SR;

All elevators;

Loads identified above shall include the spare capacity requirements identified in other Sections of this document.

c) The emergency power system Design demand shall include a 10% reserve capacity per CSA 282. Sizing of the Emergency power system for future load growth shall not include the utilisation of the 10% reserve capacity.

Provide all accessories and configuration required to meet or exceed CSA C282 and Z32.

The transient response performance from each generator will be based on a step load of 70% of nameplate kW rating (at 0.8 power factor), and will comply with the following:

Maximum Frequency Dip: -10%, with recovery within 3 seconds;

Maximum Voltage Dip: -20%, with recovery within 3 seconds.

Steady state regulation shall comply with the following:

Maximum Frequency band: +/- 0.25%;

Maximum Voltage Deviation: 1%.

Excitation field shall be derived from a PMG. The generators shall be capable of supplying 300% full load current for 10 seconds.

Alternator shall meet NEMA MG1 standard temperature limits for class H insulation, with maximum temperature rise of 130C. Winding shall be vacuum impregnated with 2/3 winding pitch.

i) Each generator shall be provided with a local Generator Control Panel (GCP) to perform independent automatic and manual start/stop and paralleling controls. The GCP shall include an alphanumeric LCD display for status and alarm notification/management, control switches, emergency stop buttons, 3-phase metering and display and integration with other systems.

j) Generator controllers shall utilise dual redundant communication networks with redundant switches and automatic failover for communications between generators and the Emergency power control system.

The Emergency power control system shall provide a means for personnel to quickly and safely overcome a failure of the system master controller or its communication networks. Provide backup controls to enable manual startup and operation of the generators.

Provide additional backup controls to safely operate the transfer switches located in the Main Electrical Room, their bypass arrangements, and the main breakers for each of the Essential branches.

The Emergency power system shall provide touchscreen operator stations and hard wired backup controls in each of the Emergency power system compound and in the Main Electrical Room.

The Emergency power control system shall have a dedicated, closed network with no connection to the Owner's network, the internet or offsite systems.

o) Generator status shall be monitored by the BMS and Fire Alarm System. The BMS will receive the following information from each Generator:

All alarm points (per CSA C282);

ii) Running/standby status;

Real time Voltage, Amps, kVA, kW and Frequency;

Fuel level (analog);

Low Fuel alarms (float switches);

p) The Fire Alarm System shall monitor the following supervisory points:

Common Generator Trouble;

Generator Running.

q) The generators shall meet all performance requirements when supplied with #2 diesel. Provide a diesel fuel storage system for each generator capable of supplying a minimum of 72 hours while the generator operates continuously at its

nameplate rating.

r) Sub-base fuel tanks shall be dual-walled with fuel leak detection and shall be constructed to be integral to each generator enclosure. Tanks shall comply with requirements of CSA B139 and ULC S601.

s) Provide two spare 50mm threaded ports for future use.

t) The generator fuel supply system shall be independent of all other Building equipment.

u) The fuel level in each tank shall be indicated by the BMS system complete by means of an analog fuel level transmitter. Each tank shall also include separate level switches to indicate low fuel and low fuel.

v) Each generator shall have a fuel polishing system suitable for maintaining the stored fuel in good condition.

w) Each generator shall be cooled by an engine-driven, fan-cooled, radiator on a closed loop system. Inlet and discharge louvres shall be motorized with fail-open springs.

x) Generator enclosures shall be insulated and heated, Designed to regulate internal temperature between a minimum of +10C and a maximum of +30C at all times.

y) The generator plant will be Designed to minimise noise emissions. Provide high grade exhaust mufflers, baffles, ducts, insulation and other sound attenuation means, as necessary, to achieve a maximum sound level of 72 dBA measured at 7 m from the Services Centre in any horizontal plane.

z) Comply with municipal requirements for maximum sound levels permitted at the Facility property line.

aa) Exhaust mufflers shall be located inside the generator enclosure. Provide insulation jackets on all exhaust piping and muffler. Provide readily accessible drain valve on muffler.

bb) Diesel generator exhaust emissions at full load on 100% diesel fuel shall not exceed the U.S. Environmental Protection Agency Non-Road Tier 2 limits. The diesel generator exhaust shall be located to prevent re-entrainment of emissions into air intakes on the Facility or neighboring properties.

cc) Provide a pre-lube pump system and forced circulation coolant heater to maintain optimal startup response times.

dd) Each generator will be resistance grounded to limit the ground fault current for equipment protection.

ee) Each generator circuit breaker shall be provided with LSIG trip units and shall be rated for maximum fault withstand and carefully coordinated for optimal selectivity and coordination with the downstream power distribution system.

ff) Provide a dedicated, permanent, exterior resistive-type load bank and circuit breaker which is capable of load testing each of the generators individually at 100% of rated load without disruption or increased operational risk to the Facility. The loadbank circuit breaker will automatically shunt trip the load bank upon loss of Utility power to the Facility.

gg) Provide the following features in each generator enclosure:

Local Panelboard;

Vapour tight type luminaires as required to achieve an average illumination of 500 lux;

Convenience GFCI receptacles on each wall (except discharge end);

Fire alarm heat detector, manual station(s), annunciation device and monitor modules;

Emergency lighting to achieve 50 lux for 2 hours;

Unit heater(s);

Wall mounted single line diagram of main distribution system;

Wall mounted data communications outlet;

Exterior pole mounted flashing strobe for indication of generator running (green), trouble/alert condition (yellow), and alarm (red);

Intrusion contact switches on doors;

xi) Exterior lighting;

xii) Analog fuel gauge;

xiii) Protective guards and blankets for hot items;

xiv) Seismically secure batteries and charger;

xv) Screening on all openings to make the enclosure bird and rodent proof;

xvi) Two means of egress.

hh) Participants shall provide all necessary test equipment, personnel, and fuel required to complete testing to the Owner's satisfaction. The Owner's representatives shall attend and witness all Factory and Site Acceptance Testing.

Site Acceptance Testing shall include:

i) 24-hour continuous test of each generator at nameplate rating using a reactive load bank;

ii) Transient response testing of each generator;

Alert and alarm response and annunciation;

iv) Cold start performance testing;

Generator synchronising and paralleling;

Transfer from/to Utility power;

vii) System response to online generator failure and emergency stop operation;

Manual start-up and synchronising (simulated control system failure);

Online performance tests with live loads, including fire pumps;

Load step sequencing and shedding.

jj) Upon satisfactory conclusion of the continuous load test, each generator shall complete transient response testing.

7.6.11 Electrical Distribution – Main Electrical Room

Basic Requirements

The Services Centre will be comprised of a Main Mechanical Room, Main Electrical Room, SR and additional associated service spaces.

The Main Electrical Room will provide a central distribution hub for Normal and Essential electrical power to:

The Facility;

The Services Centre mechanical equipment;

The SR;

Future Site development and expansion.

Locate the Services Centre to accommodate:

The Facility's initial requirements;

Accommodation of load growth with minimal disruption;

Cost-effective and practicable Site expansion and development

Provide electrical services to and from the Facility which are constructed for maximum reliability and service continuity.

Provide all distribution equipment within the Services Centre with tie-breaker arrangements, interlocks and suitably sized distribution equipment to establish a highly redundant, robust, flexible distribution scheme which provides maximum service continuity and accommodates routine maintenance and troubleshooting activities.

The Main Electrical Room will be Designed and constructed to facilitate future expansion with minimal disruption to Facility operation and continuity. The Facility will be constructed with all necessary infrastructure including spare capacity, spare circuit breakers, physical expansion space, ducts stubbed out from the Building footprint and capped off for easy future extension, pull-pits, sleeves, housekeeping pads, wiring, controls, distribution routes and ventilation as required.

Provide adequate spare physical space in the main Electrical Room and configure the equipment provided to facilitate all electrical equipment in the main Electrical Room to be easily expanded by an additional 25% without replacement, relocation or major shutdown of the existing equipment. A major shutdown is defined as a switchboard or transfer switch power outage extending beyond 48 hours, or a main transformer outage exceeding 16 hours;

Identify on the installation drawings the future utilisation of space, spare equipment, raceways, cable pull-pits and ductbanks to avoid operational disruption to the Facility.

i) Identify on the installation drawings the allowance of physical space to enable addition of future feeders to the mechanical plant and SR.

Performance Criteria

Switchgear line-ups shall be constructed as discrete assemblies, and arranged to avoid close coupling (minimum 2000mm clearance) between:

Utility and Essential switchboards;

ii) Conditional and the Vital and Delayed Vital switchboards;

Provide redundant incoming switchgear for each of the two 25kV utility services. Each utility service shall be sized to carry indefinitely the entire Site load plus identified future spare capacity and Site expansion load.

Emergency power shall be supplied to the Services Centre from the remotely located Emergency Power Plant via two physically diverse, redundant feeders.

Not Used

SWGR-MVAA2 will utilise interlocked draw-out motorized circuit breakers for the transfer and bypass arrangement

Not Used

j) The automatic transfer mechanismwill utilise interlocked draw-out motorized circuit breakers for the transfer mechanism.

k) Not Used

l) Not Used

m) Transformers for each Essential power branches shall be sized as follows:

Vital – Initial Facility load plus spare capacity as identified in Section 7.6

Delayed Vital – Initial Facility load plus spare capacity as identified in Section 7.6

Conditional - Initial Facility load plus spare capacity as identified in Section 7.6, plus the Delayed Vital load.

n) Transformers for each of the 600V Vital, Delayed Vital and Conditional branches shall be as follows:

Cooling: ANN;

Winding Conductors: aluminum or copper;

iii) High resistance grounded secondary;

Insulation: vacuum impregnated, Class H 220°C insulation, 115°C temperature rise;

Efficiency: to NRCan 2019;

Sound: IEEE C57.12.01;

Taps: four 2.5% full capacity primary taps 2x ANV/2x BNV;

viii) Enclosure sprinklerproof NEMA 2 with drip hoods and louvered vents.

ix) Provide a digital thermometer indicating average coil temperature with two stage alarm contacts connected to the BMS. The first stage to alarm at 80% capacity and the second stage at 90% capacity. Alarms to be indicated on the BMS.

o) Allocation of various loads to the respective Essential branches will be as noted in Section 7.6.13.

p) Size and configure the Conditional 600V branch distribution such that it is capable of indefinitely supplying the Conditional load (plus its spare capacity) plus either of Vital or Delayed Vital load (plus spare capacity).

q) It is anticipated that Facility load growth beyond the spare capacity identified in Section 7.6 will be achieved through provision of new 25kV services derived from the spare 25kV breakers on the Normal and Essential/Conditional power distribution switchboards. Make all allowances required to accommodate such expansion.

r) Operation of the Vital, Delayed Vital and Conditional 25kV distribution circuit breakers will typically be controlled automatically by the Emergency Power Plant control system. Refer to Section 7.6.10.

t) All ductbanks shall contain sufficient spare ducts such that the ductbank is utilised to no more than 50% of its capacity.

u) Feeders to and from the Main Electrical Room shall be physically redundant and shall not occupy a common manhole, pulpit, cable tray, raceway or switchgear section with a different branch of the Essential or Normal power systems unless a suitable physical barrier is provided.

v) All Main Electrical Room cable pullpits shall be provided with hinged cover which is load rated for the heaviest component installed in the room.

w) Provide a Main Electrical Room switchgear master control panel. This will enable maintenance personnel to rack in/out and close/trip circuit breakers all high voltage circuit breakers and all 600V rackable breakers from a remote location, without exposure to arc flash hazards. The switchgear master control panel shall be hard-wired and shall not rely on software, communications busses or wireless controls.

x) Provide dual redundant 125V DC battery-backed power supplies with charger for protective relays, controls and breaker spring charging

y) Provide a coloured lamicoid mimic bus single line diagram riveted on the front of all 12kV switchgear, main 600V switchgear and all transfer switches. Switchgear will have coloured engraved lamicoid nameplates for cubicle and circuit identification on front and rear sections. Labels shall comply with the Owner's electrical Standards.

z) All high voltage switchgear, and main 600V switchgear shall have circuit breaker auxiliary contacts connected to the Building management system to indicate operational status of each breaker.

aa) Provide a tie-breaker scheme between the 600V Vital/Delayed Vital main switchgear and 600V main conditional swtchgear. Tie breaker will have circuit breakers at both ends and will be rated to the capacity of the Vital/Delayed Vital switchgear.

bb) Not Used

cc) Provide 600:208V transformers and 208V distribution equipment to service loads local to the main Electrical Room.

dd) Feeders supplying UPS systems shall be highly reliable. Provide dual redundant feeders via physically diverse paths from Vital and Delayed sources.

ee) All elevators within the Facility will operate on Essential power.

ff) Not Used

gg) Provide a means of adding a temporary 600V 2MW diesel generator to each of the Vital and Delayed Vital distributions. It is intended that a rental generator can provide a limited quantity of temporary power in the event that the main emergency power plant fails. Provide a suitable location for the temporary generator along with ducts for power and control.

hh) Locate electrical equipment and feeder routes to minimise the risk to service continuity resulting from fire, flood, adverse weather, seismic events, Construction activities and vandalism.

Panelboards shall only serve equipment which is located on the same floor.

jj) Provide Electrical Rooms on each floor to house electrical equipment including CDP's, transformers, panelboards, contactors, relay panels, DDC panels, motor starters, disconnect switches and other electrical devices.

kk) CDP's, transformers, contactors and motor controls shall only be installed in Electrical Rooms or major mechanical service rooms.

ll) Where multiple Electrical Rooms serve a floor, the floor shall be divided into 'distribution zones' to achieve clear delineation of circuits supplied from separate Electrical Rooms. i.e. a distribution zone shall not be supplied with power from more than one Electrical Room. Clearly indicate distribution zones on the electrical plans.

mm) Panelboards shall be located in Electrical Rooms. Where approved by the Owner, panelboards may be co-located in electrical closets in Clinical and Public spaces.

nn) In select cases, panelboards may be located in corridors in non-clinical and non-public accessible areas where approved by the Owner.

oo) Provide rackable type breakers with on/test/withdrawn positions for all 600V circuit breakers sized 800A or larger.

pp) All 600V switchgear will be provided with copper busses. 208V switchgear and panelboards rated 600A and large shall be provided with tin plated copper busses.

qq) Provide circuit breaker type panelboards fully rated for the available fault current. Series-rating of circuit breakers is not acceptable.

rr) All panelboards shall have bolt-on style circuit breakers.

ss) All breakers shall be provided with factory equipped lock on/off assemblies which will accept a lock for the purpose.

tt) Do not daisy-chain the feeders to panelboard. All panelboard feeders must be dedicated.

uu) Do not feed panelboards from below. All feeders must be routed down from the ceiling for top entry into the panelboard.

vv) Panelboards shall only supply loads located on the same floor.

ww) Maximum quantity of circuits per panelboard is 84.

xx) Vertically stack the Electrical Rooms to accommodate electrical risers in an efficient manner.

yy) Electrical Rooms shall be Designed such that there is 50% spare wall space available for future electrical equipment.

zz) Locate and Design electrical equipment for ease of maintenance and with due

regard for future expansion and renovation.

aaa) For operational redundancy, the Conditional power distribution equipment in electrical sub-distribution rooms will provide an alternate source of power in the event that local Vital or Delayed Vital power is intentionally or unintentionally interrupted. Provide tie-breaker arrangements and distribution equipment sized to provide power simultaneously to both the Conditional load plus the larger of the Vital or Delayed Vital loads in that locality. Tie breakers to have circuit breakers at each end for proper isolation between switchgear.

bbb) All Vital and UPS feeders which extend beyond one fire compartment shall be 2-hour fire rated.

ccc) All 600:208V transformers will have copper or aluminum windings and be rated minimum K-13. Provide areas with significant non-linear loads with transformers with a higher K-rating.

ddd) Provide dedicated transformation equipment for diagnostic imaging equipment as required by the imaging equipment vendors.

eee) All panelboards to have 40% spare capacity and 25% spare physical space after all connected loads have been installed. Provide metered documentation that proves that the 40% spare capacity has been provided once all loads are connected to the panelboard.

fff) Components of the electrical distribution systems in any public, clinical, administrative or staff area will have long life expectancy without perceptible deterioration and a good appearance. Design and install so as to permit easy and complete cleaning.

ggg) Provide voltage transient voltage / surge protection devices for the 600V Main distribution boards in the Main Electrical Room, and for any 120/208V CDP's serving sensitive electrical loads (including diagnostic equipment, Laboratory, IMIT Equipment Rooms, ICU, Operating Rooms and Procedure Rooms.

hhh) All panels and electrical equipment shall be identified with lamicoid labels per the Owner's electrical Standards.

7.6.12 Electrical Rooms

The requirements identified in this section apply to all rooms which contain electrical service / distribution equipment.

.2 Provide a robust installation to satisfy post-disaster requirements. Ensure risks resulting from flood, fire, adverse weather, vandalism and seismic events are minimised.

Protect Electrical Rooms from ground water infiltration and separate them from plumbing and mechanical equipment. Provide raised housekeeping pads, drainage and sump pumps (on Vital power) as required in electrical service areas to mitigate the risk of flooding.

.4 Design the Electrical Room to be well ventilated and free of corrosive or explosive fumes, gases or any flammable material.

.5 Provide secure, accessible entrances to accommodate:

the addition and removal of equipment;

secure entry for authorised personnel;

routine testing and maintenance activities; and

safe egress in the event of a hazardous incident.

.6 Provide clear aisle ways and routes to permit addition and removal of major electrical equipment without impacting Facility operations and Site access. Indicate on the floor plans the removal aisle ways and routes for major electrical equipment including diesel generators, transformers sized 225kVA and greater, and all switchgear sections.

The replacement pathways will allow new equipment to be brought into its respective Electrical Room as an entire unit after factory testing, without being broken down into subcomponents requiring assembly on Site.

Electrical distribution equipment shall be arranged such that minimum clearances for safe egress are maintained with equipment in the drawn-out position.

.9 Provide the following minimum clearances around electrical equipment:

Switchgear, Switchboard, ATS, UPS;

Clear space in front equal to the full depth of the equipment;

1500mm behind, when equipment is rear accessible;

1500mm on the side, where the equipment is side accessible for maintenance.

Transformers

Clear space in front equal to full depth of the equipment;

1500mm behind, when transformer is close-coupled to rear-accessible switchgear;

c) Manufacturer recommended spacing behind, for ventilation air flow, when close-coupled to distribution equipment that does not require rear access;

1500mm on the sides that require access to internal conductor connections, when transformer is freestanding (not close-coupled to other equipment).

.11 Panelboards

1200mm in front.

.12 Increase the above clearances as required to:

Comply with Code;

Accommodate manufacturer recommendations;

c) Allow equipment replacement as one unit, without requiring dismantling / reassembly of any part.

.13 Avoid inground ducts for routing cabling between switchgear. All cabling shall be installed in an accessible location overhead in conduit or cable tray.

.14 Locate power distribution equipment to avoid interference with other services and equipment.

.15 Electrical Rooms shall not contain any plumbing system pipework or fittings (except for sprinkler systems or drainage systems serving the Electrical Room), gas lines, steam lines, medical gas lines, drain pipes, ventilation piping or water-cooled fan coil units or fuel lines.

.16 Services that do not serve Electrical Rooms will not be routed through the room.

.17 Provide dedicated supply/return ventilation branch ducts that serve only the room. Ventilation ducts will not transverse or rise through the Electrical Room, whether or not it serves the room.

.18 Electrical Rooms will have proper sealing of doors, vents, or any other gaps to prevent dust, debris, etc. from being drawn into the equipment in Electrical Rooms. Provide filters for any vents drawing air into Electrical Rooms.

.19 Install equipment, conduits, piping, ductwork etc., in Electrical Rooms such that a minimum clear height of 2133mm AFF is available.

.20 Sprinkler heads in Electrical Rooms will be located such that the spray deflector of the lowest sprinkler head is at least 1220mm (4'-0") above the highest point of electrical equipment like switchgear, transformers, distribution panels, UPS, etc., in the room.

.21 Provide drip-hoods on all equipment in sprinklered areas. All equipment shall be provided with:

rain tight fittings and o-ring seals on all top-entry raceways;

sprinklerproof drip shields;

angled overhanging drip-proof louvres at ventilation openings;

hinged doors;

plexiglass bubble covers over power circuit breakers.

.22 Provide devices and systems to minimize the noise and vibrations of electrical equipment/components (transformers, luminaries, cables etc.) to below an acceptable level as required in a health care Facility.

.23 Transformers shall be installed on concrete pads or suspended from the structure. Install transformers such that removal can be facilitated without removal of any other equipment or conduits serving the room.

7.6.13 Essential Power Distribution

.1 Essential power branches will generally follow Table 6 of CSA Z32, except where noted otherwise in the Schedule or as required to meet Appendix 2A Clinical Specifications.

Vital branch loads shall include:

50% of OR, Trauma and Procedure Room lighting, equipment and receptacles;

b) 75% of Emergency department lighting, receptacles and equipment connections;

75% of PAR lighting, receptacles and equipment connections;

d) 50% of ICU and HAU departments, lighting, receptacles and equipment connections;

50% of HDCU and NICU department, lighting, receptacles and equipment connections;

f) 80% of patient care rooms, lighting, receptacles and equipment connections;

50% of lighting and outlets in all Care Hubs, Nurse Stations and Collaboration Centres;

Interventional Radiology equipment (One CT Scanner, One Fluoroscopy, One X-ray). Receptacles supporting ancillary equipment in these rooms shall be provided with UPS and Vital power as directed by the Owner.

i) Medication rooms and other similar dispensing areas, including Automated dispensing cabinets;

Automated dispensing cabinets for medication;

Laboratories - lighting and select receptacles;

l) Electrical Rooms, Equipment Rooms and telecommunication rooms (SR, PER, SER, TR);

m) Pharmacy dispensing areas;

UPS systems;

o) Fire Alarm System and fire suppression systems;

p) Building Management System (BMS);

q) Smoke venting fans and smoke control fans;

r) Medical vacuum, air and gas systems;

s) Medical gas alarm panels;

t) Hands-free sinks with electronic operators;

u) Motorized door actuators;

v) Firefighter elevators;

w) All elevator cab and machine room lighting;

x) Life safety loads required by Building Code;

y) Stair and ramp lighting;

z) Emergency generator room equipment; and

aa) MDR (Central Sterilization) area – 20% of lighting.

.3 Delayed Vital branch loads including:

100% of all ventilation systems serving patient care rooms, laboratories, pharmacy, EOC;

100% of all Ventilation and air-conditioning/cooling equipment serving the main Electrical Room, sub-distribution Electrical Rooms, UPS Service Rooms;

100% of all Ventilation and air conditioning/cooling equipment serving the telecommunications rooms (SR, PER, SER, TR's) and EOC;

Medical Imaging Equipment

MDR (Central Sterilization) area - Two Sterilizers, Two Washers, One Cart Washer, plus associated equipment, plus 80% of lighting;

f) Fume hoods and wet vacuum systems;

Pneumatic Tube System;

Alarmed freezers and refrigerators;

Food services freezers and refrigerators and select receptacles for redundancy;

Retail services freezers and refrigerators;

k) Sump pumps and controls for all sanitary, storm and sub-surface pumping systems;

l) Alternative / redundant feeder to UPS Systems;

m) Domestic hot water system;

Steam production systems;

.4 Conditional branch loads including:

10% of OR, Trauma and Procedure Room equipment and receptacles;

10% of Emergency department lighting, receptacles and equipment connections;

10% of PAR lighting, receptacles and equipment connections;

10% of ICU and HAU departments, lighting, receptacles and equipment connections;

10% of HDCU and NICU department, lighting, receptacles and equipment connections;

20% of patient care rooms, lighting, receptacles and equipment connections;

10% of lights and outlets in all Care Hubs, Care Stations and Collaboration Centres;

h) Food Services equipment as required to maintain regular inhouse food delivery during an extended utility outage;

i) All elevators not supplied with Vital or Delayed Vital power; and

j) MDR (Central Sterilization) area - Two Sterilizers, Two Washers, One Cart Washer, plus associated equipment.

7.6.14 Uninterruptible Power Supply (UPS) Systems

Basic Requirements

The UPS systems shall be considered as mission critical and shall be Designed accordingly.

UPS systems shall be highly redundant systems with extensive provision for system bypass and backfeeds upon failure.

c) The UPS systems will be provided with features which enable ease of maintenance without disruption or increased risk to service continuity.

The UPS systems shall be continually supervised for trouble and alarm conditions. Any abnormal conditions shall immediately alert Facility maintenance staff and key personnel.

UPS systems shall be located in secure, robust service rooms which are appropriately Designed to mitigate risk from fire, flood, seismic events, vandalism and equipment failure.

Location of UPS systems and routing of feeders to loads shall maximise the reliability of the system. All UPS feeders shall be fire-rated and protected to the same requirements as applies to Vital power feeders.

g) Provide a UPS system The UPS systems shall support the Facility as follows:

- Services Centre and Server Room;
- D&T;
- Patient Tower.

Performance Criteria

Provide a modular UPS system with sufficient quantity of modules to achieve a N+1 arrangement. N+1 is defined as follows:

One UPS module can be withdrawn from service without any requirement to perform load shedding while the UPS system is loaded at 'peak load';

'Peak load' is defined as the Design load at service commencement plus 25% future load growth for UPS #2 and #3, and 50% future load growth for UPS #1.

UPS shall be sized based on an allowance of 3kw per network rack installed on service commencement (assume 20 racks), plus an expansion capacity of 3kw per rack for all identified future racks (assume 10 racks). The electrical distribution for the UPS will be sized to provide to 5kw per rack.

The UPS line side and load side electrical distribution equipment and conductors shall accommodate the UPS system at peak load.

c) The UPS System shall be configured as follows:

Certified as suitable for post-disaster application;

ii) Normally supplied from Vital power source, with fully rated, interlocked, alternate feeder from a Delayed Vital source;

Double conversion with multi-mode operation;

iv) Fully rated internal static bypass switch to bypass UPS in the event of UPS failure;

External maintenance wrap-around bypass switch for UPS servicing;

Fully redundant UPS bypass breaker arrangement (separate circuit breaker which connects the UPS line side bus to the UPS output bus);

Two fully redundant battery strings (each capable of providing the required runtime at full load) as follows:

- Services Centre and SR - 15 minutes;
- D&T – 15 minutes;
- Patient Tower – 15 minutes.

Provide a battery monitoring system providing continuous cell-level supervision of battery health for all battery strings;

Provide a "UPS System – 10 minutes of runtime remaining" and "UPS System – 5 minutes of runtime remaining" audible warning and indication station (via the BMS) in the following locations:

- Services Centre Control Room;
- SR);
- FMO Electrical Workshop;
- Protection Services Office;
- Switchboard;
- EOC;
- PER;
- SER;
- OR Care Team Station.

Provide monitoring of all alarm and trouble conditions of the UPS system by the BMS.

Locate the batteries for the UPS system in dedicated UPS Service Rooms or Electrical Rooms which are not part of the SR, PER or SER. The ambient temperature of the UPS Service Room shall be controlled to achieve maximum runtime and reliability of the UPS system.

xii) UPS Service Rooms shall be constructed to the same requirements at an 'Electrical Room' and shall contain the main distribution equipment for the UPS.

xiii) Provide Uninterruptible Power Supply (UPS) systems to serve all areas of the Facility. The UPS systems shall support the loads identified below plus equipment, receptacles and lighting identified by the Owner's operating staff during Design.

- 50% of room lighting, 40% of receptacles and select permanently connected equipment (as identified by the Owner) in OR, Trauma and Procedure Rooms;
- 100% of the surgical procedure lights in Operating Rooms and Procedure Rooms;
- 15% of Emergency department lighting, receptacles and equipment connections;
- 15% of PAR lighting, receptacles and equipment connections;
- 40% of ICU and HAU departments, lighting, receptacles and equipment connections;
- 40% of HDCU and NICU department, lighting, receptacles and equipment connections;
- 40% of lighting and receptacles in Care Hubs, Care Stations and Collaboration Centres;
- 20% of laboratory receptacles;
- EOC equipment, lighting and receptacles (refer to other sections);
- Protection Services Office equipment;
- Switchboard;
- Building Management System;
- Security systems;
- Pneumatic tube system controls;
- All network equipment located in the SR, PER, SER and TRs including:

xiv) network equipment for the wired and wireless networks;

xv) PBX and other telephone equipment;

xvi) wireless access points;

xvii) wireless communications system;

xviii) RTLS systems;

xix) Patient Wandering system;

xx) Infant protection system;

xxi) nurse call system;

xxii) Public address system;

xxiii) Intercom.

Provide an input filter at each UPS module to limit the total harmonic current distortion to 5% when the UPS module is carrying 100% rated load.

The UPS will be capable of providing adequate fault clearing current for a 100A circuit breaker without operation of the static bypass switch.

7.6.15 Metering

Basic Requirements

Provide a power metering system Designed to provide sufficient information to enable the Owner to make Facility-wide "demand-side management" decisions relating to overall energy demand, with the intent of reducing overall energy consumption and demand throughout the Facility.

Design the power metering system to be accessible from any networked computer using appropriate software.

Provide networked, digital microprocessor metering to provide detailed information about power consumption at key points throughout the Building.

Ensure that metering is provided to record real-time and historical electrical energy consumed by the Facility. Integrate information from all meters on a common software platform residing on a dedicated electrical metering server.

Provide integration between the power metering system and the BMS such that all metering data is available to the BMS in real time. Provide all required software, hardware and licensing to provide remote monitoring and third party assistance, re-programming and troubling shooting.

Provide additional meters required to measure energy performance in order to determine performance in accordance with section 7.5.

.2 Performance Criteria

Provide metering displays at key locations to indicate real-time load demand information. This data will enable maintenance personnel to manage demand and perform load shedding during abnormal conditions.

Load bank feeder;

Main distribution of the Vital, Delayed Vital and Conditional branches;

All UPS output busses;

All Centralized Distribution Panels;

Panelboards (as required to satisfy requirements of ASHRAE 90.1 / LEED etc.);

x) All Motor control centres;

xi) All major mechanical plant items (as determined by the Owner);

xii) All feeders to elevators;

All other requirements of ASHRAE 90.1 and as required to meet the LEED Gold standard.

Metering will may be integral to the circuit breaker or displayed on a separate power meter display on the same distribution section.

Design the metering system network to store historical data and to have the capability to generate user configurable electronic and printed reports on demand.

The metering system shall have user configured software alarms to alert maintenance staff of abnormal conditions. Coordinate with the Owner's operating staff during Design to provide the required alarms.

The metering system shall be supplied from a UPS circuit or station service power to ensure operation when the meter while its circuit is de-energized. The metering system shall not be dependent on power from the metered circuit for its operation.

7.6.16 Site Electrical Work

Site Services – General

Provide inground concrete junction boxes distributed across the Site that contain the Site power and communications wiring. Communication system wiring shall not share the same manhole, pullbox or ducts as power systems.

Allow for a minimum of 12 power junction boxes and 12 communications pullboxes. Coordinate the location of these with the Owner's operating staff during Design. Provide suitably rated lids on each box and identify the services it contains.

Junction boxes and pullboxes shall contain the circuits for Site lighting, ticket machines, vehicle barriers, signage, receptacles, security cameras, wireless communication systems, duress stations and miscellaneous equipment.

Provide a minimum of two spare 53mm ducts to each communications pullbox and power junction box. Provide labelled pullstring in each spare duct.

In addition to the above requirements, provide separate dedicated inground services for EV charging stations, emergency kiosk and inter-Building power and communications services.

Provide suitable drainage in each pullbox and junction box such that there is no standing water in any inground box or duct.

EV Charging Facilities

Provide Electric Vehicle (EV) Level 2 'Smart' Charging Stations for a minimum of 6% of the total parking stalls; Consult with the Owner's operating to determine the location of these stalls. Coordinate the EV stall locations to accommodate accessibility requirements.

b) Provide Electric Vehicle (EV) Level 2 'Smart' Charging Stations for 6 FMO vehicles. Location to be determined during Design consultation.

Provide Electric Vehicle (EV) Level 2 'Smart' Charging Stations for 6 VIHA pool vehicles. Location to be determined during Design consultation.

EV charging stations will be supplied with Conditional power. Automatically load shed EV charging stations while the Facility is operating on Emergency power;

Electric Vehicle chargers are to be networked to allow total control of service availability and usage rules with complete remote manageable capabilities;

Car chargers are to be Designed for exterior installation and shall be Nema 3R rated, equipped with charging cables certified to operate in temperatures between -10C to 35C;

Car charging stations shall be provided with dual charging cords. The charging system shall be equipped with wireless communications capabilities to enable wireless billing to customers and remote system administration.

f) Provide receptacles for Electric Bicycle charging. Coordinate quantity and location with the Owner. Refer to section 4.4.5.

g) Ticket Machines

Provide parking payment machines at a minimum in the following locations:

Minimum two parking payment machines in the main lobby;

iii) Minimum one parking payment machines in the Emergency Department Waiting Area.

7.6.17 Wiring Methods and Materials

Basic Requirements

a) Use wiring methods, materials and devices that result in a safe, reliable and flexible electrical power, lighting control, communication, data and life safety system.

Install all wiring in a neat and secure manner so that it is protected from damage, is not in conflict with mechanical or architectural components and allows for future changes and additions.

c) Do not install conduit or wiring in floor slabs, except where it is impossible to

supply the device from the ceiling, and specific approval has been granted by the Owner.

EMT is to be surface mounted in service rooms and concealed in ceiling spaces and partition walls. Raceway systems will not be accessible to patients or the public.

Do not encase EMT in concrete.

.2 Performance Criteria

Utilize non-alloyed copper for all conductors in the Facility's wiring systems, except where noted otherwise. Minimum conductor size will be #12 AWG. Where acceptable by code, aluminum conductors may be used for feeders larger than #6 AWG.

All conductors #12 AWG and larger will be stranded.

c) All bonding conductors will be copper.

d) The Participants may use Teck cable in mechanical plant rooms and service rooms for connection to mechanical equipment. Teck cable will be installed in perpendicular runs and will be neatly strapped to dedicated cable tray. Do not support armoured cabling from mechanical ducts, pipes or equipment. Where possible, Teck cable runs will be consolidated into common routes.

Except as noted below, armoured cable (AC90) may be used only for final connections from concealed junction boxes to lighting fixtures on suspended ceilings. The maximum length of any individual piece of armoured cable is 3.0 metres.

Branch circuits from flush mounted panelboards will be routed to a large pullbox located in the ceiling space immediately above the panelboard for distribution through the above-ceiling service space.

g) Each branch circuit will be provided with a dedicated neutral conductor. Identify all branch circuit conductor neutrals to match corresponding hot conductor circuit number.

Install an individual bonding conductor in each conduit and/or raceway.

7.6.18 Wiring Devices

Basic Requirements

Provide minimum quantity of receptacles located a required to meet the following requirements:

As identified in CSA Z32 and the Canadian Electrical Code;

ii) As identified in Schedule 2 and Schedule 2A Clinical Specifications and room data sheets;

iii) As required to support the needs of the Owner supplied equipment;

As required to support the activities being performed in the area;

To support Food Services equipment, including preparation equipment and food delivery carts.

As determined by the Owner's operating staff during Design consultation;

In accordance with good engineering Design and industry best practices to provide convenience, flexibility of use and operational

support throughout the Facility (including during mass casualty events).

Provide special receptacles for fixed and moveable equipment and make all connections in accordance with manufacturer's installation recommendations for the Owner supplied equipment.

Make allowances for the installation of all Owner supplied equipment, surgical and procedure equipment, medical imaging equipment and devices.

Final quantity and location of all receptacles and connections will be determined in user group meetings and as directed by the Owner during the review procedure process.

.2 Performance Criteria

All device outlets to be installed at a height which allows for good ergonomics and not less than 450mm AFF unless required by code. Outlets to be typically installed at 450mm AFF, except for outlets mounted at 1100mm AFF in:

Electrical Rooms;

ii) TR's;

Equipment storage rooms;

iv) MDR;

Operating, Trauma and Procedure Rooms;

vi) Rooms identified during Design.

All device outlets and communication outlet boxes will be a minimum 4" square welded steel type, equivalent to an Iberville 5200 series. Provide mudrings on all single device outlets.

Provide hospital grade receptacles for all patient care areas. Receptacles in all other areas will be specification grade.

Provide tamper resistant receptacles in public areas, waiting rooms and anywhere children are likely to be present.

Provide Extra Heavy Duty, Hospital Grade, tamper resistant receptacles in the Psychiatric Inpatient Unit. Circuits supplying these receptacles shall not serve multiple rooms and shall all be supplied from GFCI circuit breakers.

f) Utilize smooth stainless steel cover plates for receptacles and switches unless noted otherwise. Grouped receptacles and switches will have a single cover plate for the whole group.

g) All receptacles, devices, outlets and switches in the Psychiatric care areas will have extra strength high impact thermoplastic nylon faceplates and tamper-proof screws. Cover plates shall be installed over a bed of security caulking.

Install all electrical devices and equipment located in the Psychiatric care areas with tamper-proof security screws.

Colour of power receptacles will be as follows:

Normal and Conditional power – WHITE;

ii) Vital and Delayed Vital power – RED;

UPS power – GREY;

Housekeeping – BLACK.

All receptacles will be identified with panel and circuit number. Colour of labelling will be in accordance with Owner colour coding Standards as follows:

Vital power - RED with WHITE text;

Delayed vital power - BLUE with WHITE text;

Conditional power - YELLOW with BLACK text;

UPS - GREY with BLACK text;

v) Normal power - WHITE with BLACK text;

Allow a maximum connection of three general use receptacles to one 15 amp circuit.

l) Provide one dedicated duplex receptacle for microwaves, coffee makers, refrigerators, ice machines and water dispensers. Provide an unallocated 20A overcounter duplex receptacle on each countertop.

Provide one duplex convenience receptacle rated at 15A, 125V in all rooms. This is in addition to all other receptacles identified in this Schedule.

n) Utilize NEMA 5-20R receptacles for printers and copiers. Provide 20A rated dedicated circuits for each printer and copier.

o) In staff, public and patient washrooms, provide one (1) GFCI 15A 120V duplex receptacle above the counter connected to Conditional power.

p) Utilize NEMA 5-20R receptacles for housekeeping staggered on alternate sides of the hallways spaced a maximum of 10 meters apart. Provide 20A rated dedicated circuits for each area, to a maximum of 6 receptacles per circuit.

q) Provide a minimum of one power outlet on each wall in all offices. In single occupancy offices, two outlets will be quadplexes located to serve the location of separate workstations, the other two will be convenience duplexes.

r) Provide a minimum of one 15 Amp circuit per two single-person enclosed offices.

s) In each multi-occupancy office provide a minimum of one quadplex receptacles for each desk or workstation and a minimum of one duplex receptacle spaced every 3000mm of open wall space.

t) Provide a minimum of one 15 Amp circuit per three open-plan office workstations.

u) Each workstation in a clinical area will have a minimum of two receptacles utilizing one quad receptacle and one duplex receptacle. Locate the quad receptacle above the work surface and duplex below the work surface.

v) Provide a convenience duplex receptacle with additional dual USB ports in public and patient waiting areas, staff rooms, cafeteria and refreshment areas. Receptacles shall be provided at a ratio of one duplex for every 4 seats.

w) Provide a minimum of one 20 Amp outlet mounted at 1200mm AFF in all corridor equipment alcoves.

x) Provide a surface raceway system installed at 1200mm AFF for equipment storage rooms where equipment is charged (e.g. IV pumps). Provide high density of receptacles for maximum quantity of devices which could be located in that area, plus 25% spare.

y) Provide a minimum of four duplex receptacles connected to two dedicated circuits in each exam or treatment room, two of which will be fed from Vital power.

z) Provide a minimum of four duplex receptacles at each clean utility room, 50% of

which will be fed from Vital power and the remainder connected to Conditional power.

aa) In each Team Care Station (nurse station), and satellite team station provide one quadplex receptacle spaced 1500mm on centre below work surface and 1500mm on centre above the work surface. Provide additional receptacles on rear walls/worksurfaces or islands/columns within the Care Station as directed by the Owner. Coordinate the different power types supplying the receptacles with the Owner. Al receptacles located above the worksurface shall have integral dual USB ports.

bb) To ensure Staff are able to charge phones, tablets, etc. provide 5-15R duplex receptacles with integrated dual USB ports at various locations throughout the New Facility including:

Care Hubs;

ii) EOC;

Multimedia Rooms;

On-Call Room;

EOC;

Staff Lounge.

cc) In each meeting room, break-out room, video conferencing room provide duplex receptacles every 2000mm of wall space, and every 1000mm above work counters. In addition, provide receptacles for all dedicated equipment such as microwaves, coffee makers, refrigerators. At all locations with overhead Projectors provide 15 Amp 120 volt receptacle located at ceiling and provide one 27mm conduit and pullstring to floor box and connection to wall outlet for the video signal to the Projector.

dd) Provide one duplex receptacle for every 10 square meters, or portion thereof, of service, housekeeping and storage space. A minimum of one duplex receptacle will be provided per room.

ee) Provide a minimum of four duplex receptacles at each medication room, connect 50% of these receptacles to vital power.

ff) Provide two duplex receptacles at each patient treatment bed or care location in patient care areas defined as a "Basic Care Area", and connect one of the receptacles to Vital power.

gg) Provide five duplex receptacles per patient care location defined as an "Intermediate Care Area", and connect three of the receptacles to Vital power.

hh) Provide ten duplex receptacles per patient care locations defined as "Critical Care Area", and connect 75% of these receptacles to Vital power. The remainder of receptacles will be connected to Conditional power.

Provide one duplex receptacle for each electric bed where applicable in all patient care areas and connect to Vital power. Provide one 15A 120V dedicated circuit for three patient beds maximum.

jj) Provide one hospital grade receptacle with dual USB ports per inpatient room headwall.

kk) Provide one duplex Vital receptacle in each alcove in Emergency and Ambulatory Care. Install at a height of +1200mm AFF.

ll) Provide additional receptacles in the Emergency and Ambulatory Care department

corridors for 'surge events' where patients may be located on stretches. Coordinate quantity and location with the Owner during design. Allow for hospital grade Vital receptacles installed at 5 metre intervals along usable corridor walls at a height of +1400mm AFF.

mm) Provide special receptacles for fixed and moveable equipment as defined in the Appendix 2I-1 Equipment and Furniture List.

nn) In Operating Rooms, surgical rooms, Procedure Rooms and similar usage rooms and as directed by the Owner, provide:

equipment booms: a minimum of ten 5-20R duplex receptacles on seven dedicated circuits

anaesthesia booms and auxiliary booms: ten 5-20R duplex receptacles on five dedicated circuits.

iii) one receptacle for laser on boom(s) or locate one adjacent to the Anesthesia boom at the foot of the bed as required and directed by the Owner. Connect laser receptacle to the UPS branch.

one 5-20R duplex receptacle at 1200mm AFF, on 2000mm centres, connected to Vital and UPS branches as determined during Design.

one 5-20R duplex receptacle at +450mm AFF on 4000mm centres on Conditional power.

one 5-20R duplex receptacle for housekeeping outlet in two locations as determined during Design.

one-20A, 208V twist lock receptacle in two locations.

oo) Provide each workbench (testing stations) in the Biomedical Engineering department with one 50A 208V outlet, plus 4 dedicated 15/20A, 120V duplexes. 50% of the outlets will be provided with Vital power circuits. The remainder will be supplied on Conditional power. Provide 3 ceiling mounted retractable cord reels complete with two 5-20R duplex receptacles on one dedicated circuit per cord reel. Locate cord reels as directed during Design. Provide additional 5-20R duplex receptacles as required by the Owner.

pp) Provide a minimum one 5-20R duplex receptacle for every 25 square meters, or portion thereof, of service and storage space. Coordinate with the Owner's operating staff to allocate additional receptacles in mechanical service spaces to support maintenance activities and ancillary equipment.

qq) Provide one 5-20R GFCI duplex receptacle in each housekeeping room.

rr) Provide each Electrical Room with 5-20R duplex receptacles at a maximum spacing interval of 3m. Alternate circuits between Vital and Conditional power.

ss) Utilize weatherproof 5-20R duplex receptacles on the exterior of the Building. Provide Class A type GFCI breakers for all exterior outlets. Additionally, strategically locate receptacles in soffits, overhangs and entrance and exits to the Facility, located as required by the Owner.

tt) Provide a 15A 120V Vital circuit, low voltage transformers, and junction box for all ceiling lifts and overhead lifting equipment. Make all required connections and install in accordance with the manufacturer's recommendations. Maximum 4 rooms per circuit.

uu) Provide one 15A, 120V Vital power circuit for all hands-free automatic door operators throughout the Facility. All surgical suites, medication, utility rooms, storage rooms and similar usage rooms will be provided with automatic door

operators. Provide power for all automatic door operators as.

vv) Provide 15A, 125V conditional power circuits complete with junction box and receptacle for all heat traced mechanical p-traps. Provide at a maximum 4 p-traps connections per dedicated circuit. Coordinate with the mechanical division for exact locations.

ww) Provide a 15A, 125V Conditional power circuit complete with junction box and low voltage transformer and connect to all mechanical trap primers. Provide at a maximum 4 trap primer connections per dedicated circuit. Coordinate with the mechanical division for exact locations.

xx) Medical Device Reprocessing departmental area will be provided with minimum 1 general use NEMA 5-20R 15/20Amp 120V duplex receptacle on the walls at 3 meter centres. 50% of these receptacles to be connected to the Vital power and the remainder from Conditional.

yy) Provide receptacles as required to support Food Services preparation and distribution equipment.

zz) Provide adequate space and power outlets for wireless device charging stations and UV cleaning stations inside each department, taking in to account that charging units with multiple devices may cause signal concentrations that impact active unit performance. Sufficient spread of units must be maintained for both charging and storage areas so as not to impact operational performance of active units.

7.6.19 Raceways

.1 Basic Requirements

Provide raceways for all wiring and cabling to support, protect and organize all wiring and cabling systems.

Design raceways to provide ease of access and install with capacity for expansion and change, consistent with the requirements of the equipment and systems that they serve.

Install all raceways in a neat and secure manner in such a way that they are protected from damage, are not in conflict with mechanical or architectural components and allow for future changes and additions.

d) Locate junction boxes, pullboxes and raceways in readily accessible locations to facilitate future renovations, maintenance and testing requirements.

e) Construct separate raceways to isolate systems of different voltages and prevent magnetic interference to low voltage system conductors.

Do not unnecessarily oversize cable trays in ceiling voids beyond the spare capacities called for in this schedule.

Clearly identify spare raceways as such and avoid impeding access to and future use of these spare raceways. Install smoke seals in all spare open-ended raceways and provide pullstrings labeled at each end.

h) Except as noted otherwise, install wiring in EMT with steel couplings and connectors.

i) Separate all wiring for systems of different voltages and from different sources and do not run in common raceways. Maintain adequate shielding and separation between wiring for power and communication systems to prevent interference.

Install communication system wiring (unless otherwise required by applicable codes and Standards) in EMT with steel couplings and connectors and/or cable trays. Install individual steel backboxes for all communication system devices. Conduits connecting to cable trays for communication system wiring will be mechanically connected, completed with grounding bushings.

All vertical penetrations through floors will be sealed watertight. Raceways (including spares) will extend a minimum height of 200mm above finished floor to avoid flooding passing to level below.

.2 Performance Criteria

Minimum EMT conduit size is 21mm (3/4”), except for raceways installed to serve door hardware devices at the door frame in which case 16mm (1/2”) EMT may be used.

b) Minimum EMT conduit size for Communications Outlets is 27mm (1”). Conduits will terminate in a bonding type bushing 150 mm above the tray’s sidewall.

Use flexible metal conduit for all final connections to vibrating equipment, such as transformers and motors.

Minimum flexible conduit size is 27mm and maximum length of any flexible conduit run is 1500mm.

Cable Tray - power system

will be aluminum ladder type with manufactured fittings. Provide continuous copper bonding wire as required by code. Provide bare copper bonding jumper between the cable tray and every associated conduit to ensure continuous bond between tray and communication systems raceways.

g) Participants will ensure that any cable tray installed is not loaded beyond 50% its maximum fill capacity based on a 100% diameter spacing of the largest cable installed on the tray. Provide calculations to demonstrate compliance if requested by the Owner.

Cable Tray – Structured Cabling

Provide cable trays for installation of all communication system wiring and the following security systems:

Access Control

Video Surveillance

Provide basket cable tray:

- In the Facility’s hallways and corridors;
- In the SR, PER, SER and TR’s;
- To support all wiring related to the EOC and radio antenna systems;
- For use as vertical risers to provide cable strain relief.

v) The size for all types of communications cable tray will be

- Minimum depth will be 100 mm;
- The fill ratio for communications cable tray is to be 50% maximum at Substantial Completion of the Project. The

remaining 50% is reserved for future growth capacity.

The Participants will maintain the following clearances when Designing and installing communications cable tray:

- A minimum of 1220 mm from any motor;
- A minimum of 50 mm from light fixtures;
- A minimum of 150 mm from any source of EMI;
- A minimum of 305 mm of continuous clearance on at least one side of a communications cable tray along its entire length wherever it is installed in the Facility to enable installation and maintenance of Structured Cabling and Extra-low Voltage communications systems wiring;
- Provide a minimum of 150 mm above, 150 mm horizontally and 75mm below of clearance from piping, conduits, ductwork, etc.;
- The bottom of the communications cable tray will be between 200 mm and 300 mm above an accessible finished ceiling.

vii) The Participants will provide manufactured cable dropouts where cables exit and enter all horizontal communications cable trays.

- Tray manufacturer's cable dropout fittings that clips over the side of the communications cable tray without the need to cut into the cable tray will be provided;
- Participants will undertake the Design and Construction of the communications cable tray in a manner that enables the cable dropouts be placed to empty cables directly and fully into vertical cable management channels, GigaBIX cable management modules and other sections of communications cable tray.

Where cable trays pass through walls with fire resistance ratings, provide a non-removable ULC approved firestopping system similar to 'Hilti Speed sleeve' of sufficient quantity to accommodate the entire capacity of the cable tray.

Surface raceways may be installed where required and approved by the Owner. Typical areas will include laboratory spaces, workbenches, nurse stations, and other areas where frequent changes in power and telecommunication outlets are likely.

j) Modular Furniture and Custom Millwork

Pathways will typically be concealed, however, if approved by the Owner, surface raceways may be installed in unique circumstances;

Where the wiring channels is jointly-used, the electrical system wiring will be isolated from the communications system wiring by a metallic

shield within the power cable or a metallic barrier separating the two;

Connect all required branch circuits to branch wiring devices located in systems furniture. Fully test and commission each connected device.

Identify all conduits, raceways, pull boxes, and junction boxes using painted colour bands. Colouring scheme will be determined by the Owner. Provide all power and communication systems with unique colours in accordance with the colouring scheme. Major colour to be 100 mm wide and minor colour to be 50mm wide. Identify raceways with coloured bands (using either spray paint or coloured duct tape) at intervals of 6 m, plus at each point where the raceway enters a wall or floor (i.e. raceway is identified on both sides of a penetration to facilitate tracing of raceway). Colour-code all junction boxes using spray paint on the cover. Neatly identify the relevant system and circuit ID using permanent identification. Identify parallel conduit runs at common locations.

Provide a minimum of two spare 103mm conduits with pull strings from the Main Electrical Room to each Electrical Room, Mechanical Room or similar rooms that house electrical distribution.

m) Provide a minimum of three spare 27mm conduits from all panelboards to terminate in an accessible location in the ceiling space above the panelboard.

All Division 25 (Building Management System) raceways shall be provided and installed by the Controls Contractor in strict adhere to Division 26 installation Standards.

o) Do not encase conduit in concrete, except for where conduit encased in concrete is necessary to achieve a concealed installation in finished spaces such as exposed Architectural Concrete stairwells, floor boxes in Multimedia Rooms, and Emergency Operations Centre, etc. For these areas utilize rigid PVC conduit and ensure conduit runs:

i) Be reviewed by the Owner's operating staff as being necessary to achieve a concealed installation in finished spaces;

Are as short as possible and are installed parallel to the Building lines;

iii) Emerge from the concrete in the closest adjacent space above suspended ceilings;

iv) Photographs are to be taken of the conduit system before concealment. Images are to be incorporated into the Construction documentation system;

Conduit routing to be indicated by conspicuous permanent identifiers set in the floor every 5 meters and at each change in direction.

p) Provide all duct banks with 50% spare conduits equal to the largest conduit size.

q) Install individual bonding conductor in each conduit and/or raceway.

7.6.20 Medical Service Headwall Units Systems

Basic Requirements

Coordinate the provision of power, communications, systems, nurse call and lighting control into the headwall systems. Provide quantity of devices and outlets as defined by user group consultation.

Provide the minimum quantity of power outlets in patient care areas in accordance with relevant CSA standard and the classification of loads and branches in

accordance with this standard.

Provide additional receptacles are defined elsewhere in this schedule.

.2 Performance Criteria

Provide horizontal or vertical type medical service headwall units as directed by department representative and identified in Appendix 2A Clinical Specifications.

Conceal within walls all of the mechanical and electrical services feeding the medical service units.

Exact medical service unit dimensions and configurations to depend on the room layout and the available space. Generally, the medical service unit length will suit the quantity and location of outlets and all outlets will be clear from the width of the bed.

Provide concealed headwalls in the Psychiatric Inpatient Unit.

7.6.21 Grounding and Bonding

Basic Requirements

Provide grounding and bonding for all electrical equipment and systems in the Facility for the safety of people and for protection against damage to equipment or property in the case of a fault occurring in any of the equipment or systems. Install grounding and bonding as required by all applicable Standards.

b) Provide supplementary grounding per relevant CSA Standards in areas identified as patient care areas.

c) Provide a copper ground conductor within all raceways.

.2 Performance Criteria

Utilize non-alloyed copper for all conductors and all conducting components of electrical equipment which form part of the grounding and bonding systems in the Facility.

Provide a high resistance grounding scheme for all transformers serving 600V systems.

c) Provide a minimum #12 copper bonding conductor in each conduit or raceway.

Provide an exposed, wall-mounted, copper, ground bus on stand-off isolators in each Electrical Room and Telecommunication Room (SR, PER, SER, TR) connected to the central grounding system. Identify all grounding conductors with permanent lamicoid tags.

Provide equipotential grounding systems and equipment for all patient care areas. Provide a minimum #6 AWG copper bond from the panelboard to each room reference ground bus RRGB in each patient care area.

Each room containing a patient care area shall have a centralised room reference ground bus enclosure. The enclosure shall be located above the ceiling in a readily accessible location, typically in the centre of the room. Suspend and support the enclosure with 'ready-rod' type hangers such that the enclosure cover is no higher than 600mm above the ceiling. Provide barriers to achieve segregation of each branch of the Essential system. Extend conduits from the enclosure to outlets in the room.

All patient reference grounding conductors shall be uniquely identified at each end by a numbered cable ferrule.

h) Bond all exposed non-current carrying components of communication, radio or television equipment in patient care areas to ground using a properly sized equipment bonding conductor per CEC.

i) Complete a lightning protection study for the Facility per CAN/CSA B72, such study to be done by a specialist in lightning protection work and to be signed and sealed by a professional engineer registered in British Columbia.

7.6.22 Lighting

Basic Requirements

Design lighting with the objective of creating a safe, comfortable working environment and an environment conducive to healing and recovery.

b) Lighting systems will accommodate the needs of patients, staff, FMO and visitors.

Lighting schemes will enhance the function and visual appeal of the Facility.

Lighting systems will support the visual tasks being performed and the desired appearance of the space.

Provide lighting schemes that accommodate multiple lighting 'scenes' for different use cases for rooms e.g. general illumination, patient examination, reduced illumination for night-time hours, cleaning, maintenance activities and ambient lighting.

Where multi-level lighting is required, each luminaire shall have multiple levels of lighting. Switching of different luminaires on and off shall not constitute multi-level lighting control.

Lighting schemes shall be Designed for the tasks being performed in the space. Do not provide lighting schemes intended primarily for minimising the quantity of luminaires and controls.

Lighting Designs will mitigate glare and uncomfortable lighting conditions.

i) Provide dimmable LED lighting systems to maximise user comfort, controllability and energy savings.

j) Lighting schemes shall be Designed to achieve a high level of efficiency and minimise life cycle costs for the Facility. Use high quality luminaires, high efficiency light sources, and best practices for Design of lighting schemes.

Provide complete lighting solutions which align with the requirements and recommendations of IESNA RP-29 and CSA Z317.5.

l) Illuminance levels for room types commonly found in healthcare facilities will be consistent with IESNA RP-29 or CSA Z317.5 whichever is higher.

m) For areas and tasks that are not unique to healthcare facilities illuminance levels will be consistent with IES The Lighting Handbook, 10th ed. (2011).

n) Lighting power density levels will comply with ASHRAE Standard 90.1 and LEED Gold requirements.

o) Exterior lighting will meet the requirements of Section 4.4.5 Site Lighting.

Performance Requirements

Use LED lighting technology for all Project luminaires. Where LED products are not available, utilize high efficiency fluorescent lighting. Do not use incandescent or compact fluorescent lighting unless otherwise indicated.

All luminaires shall be provided by a supplier with minimum 10 years history of providing quality luminaires for hospital lighting in North America.

Provide hospital grade luminaires in all clinical areas.

Provide architectural grade luminaires in administration, general areas, public spaces and the Facility exterior.

Provide specification grade luminaires in utility, service and storage areas.

All luminaires, drivers and ballasts to be provided with a minimum five year warranty.

g) When use of fluorescent luminaires is necessary, utilize program start electronic ballasts wired in parallel for fluorescent lamps with a THD of 10% and no more than 8% for third harmonic. Power factor will be .98 or greater and efficiency will be 90% or higher. Ballasts manufactured in a Facility certified to ISO9002.

LED sources will have the following characteristics:

For colour temperature consistency, LEDs will come from the same bin number and have no more than a 3 step MacAdam ellipse;

LED must use a high frequency driver as to eliminate flicker;

Testing of the LED luminaires will comply with IESNA LM-79 and IESNA LM-80;

Minimum L70 of 50,000 hours per TM-21 Standards.

i) All luminaires will be free of light leaks.

Luminaires used inside the Facility will have a colour temperature of 3500°K. Variation from the 3500°K colour temperature may be allowed in limited areas (e.g. NICU, Psychiatry decorative application), if approved by the Owner's operating staff during the detailed Design phase.

k) Luminaires used on the Facility exterior (including Site lighting) will have a colour temperature of 4100°K.

All exam lighting will have an R9 value of 50 or higher in accordance with the WELL Building Standard to accurately portray colors in the space and enhance occupant comfort.

m) In clinical spaces and patient corridors, all lighting will have a minimum CRI (Colour Rendition Index) of 85 in accordance with CSA Z8000-18 to ensure accurate skin colour.

Where patients are being transferred and/or lying on a stretcher provide volumetric or indirect lighting to limit glare to patients.

o) Special considerations must be given for placement of light fixtures in all spaces to ensure that light fixtures do not interfere with the ceiling lift system.

p) Selection and location of all luminaires will be closely coordinated with the IP Video Surveillance system to avoid "wash-out" of IP Video Surveillance video images and to ensure proper illumination levels are maintained to permit video capture from the IP Video Surveillance system.

q) When remote drivers are used:

i) The box containing the driver will be ventilated;

The box and driver assembly will be cUL / CSA approved as a system;

Voltage drop, power losses, and temperature will be properly accounted for.

r) Provide task lighting with individual control:

with illumination levels as required by CSA Z317.5 Designed for the types of functions conducted in rooms and areas where task oriented work is carried out;

to illuminate counter and work areas;

above all hand hygiene sinks;

under all upper cabinets located above a workstation, work surface, sink or countertop.

Task lighting shall have wall mounted local light switches at the room entrance or adjacent to the task area, and shall be automatically switched off when the room is unoccupied.

t) Task lighting with hands-free switches shall be provided for all hand hygiene sinks.

u) Provide standalone battery-operated emergency LED lighting, in accordance with CSA Z32 and the following:

Operating Rooms;

Delivery rooms;

Angiographic laboratories;

Cardiac catheterization laboratories;

Trauma rooms;

Minor Procedure Rooms;

Other patient care areas where a procedure may be in progress, and cannot be interrupted;

Main Electrical Room;

Generator

v) Luminaires in corridors of high intensity care areas (including those departments listed below) shall be circuited for increased redundancy such that each consecutive luminaire is on a different circuit than its adjacent luminaire:

Operating Rooms and PAR;

ii) Procedure Rooms;

Emergency Department;

LDRP;

NICU;

Psychiatric Departments;

Main Pharmacy.

w) No area will have luminaires circuited from only one power source. Circuit the luminaires in all interior and exterior areas from multiple power sources so that if one power source is not available emergency light levels are met.

x) Individual lighting circuits shall be limited to serving a maximum of three rooms. These circuits shall not be used for any other loads.

y) Refer to Section 7.6.14 Uninterruptible Power system for lighting which is required to be on UPS power. Exact selection and placement of luminaires supplied by UPS power will coordinated with the Owner's operating staff during Design.

z) In locations where it is necessary (for example high atrium) to install luminaires in locations not routinely accessible without fall restraint / staging, utilize long life LED luminaires and install the remote drivers in a readily accessible location.

aa) Utilize recessed, enclosed, architectural troffer LED luminaries in offices, reception areas, and other areas where computer terminals and similar screens are present.

bb) Where patients are being transferred and/or lying on a stretcher provide low glare LED lighting to limit glare to patients.

cc) Place an illuminated sign outside all corridor accessible single occupant patient washrooms, controlled by an occupancy sensor to alert staff that the washroom is occupied.

dd) Provide local lighting control for each treatment room. Each room will have widely variable dimmable lighting systems which support clinical tasks through to dim lighting levels for rest and recovery.

ee) Provide the following for patient rooms:

Separate lighting control for each of the following areas:

- Entry (locate dimmable control at entry);
- Handwash sink (locate hands-free on/off control at handwash sink);
- Recessed overbed patient exam lights (locate control at headwall);
- Patient reading light (locate on/off control on headwall, on Smartbed and on pillow speaker);
- Patient chair area (locate dimmable control adjacent to chair);
- Family Area (locate dimmable control at family zone);
- Washroom (locate dimmable control at washroom door); and
- Night Lights (provide one nightlight in the patient room and one on the wall behind and above the toilet).

Patient Room night light shall be an unswitched amber LED night light located at 450 mm above floor to prevent tripping hazards between the bed and washroom. Night light will direct light to the floor (ex. louver) and be located to not disturb patient sleep.

Position patient bed accessible switches above the bed for convenient access.

ff) All exterior lighting to be LED. Outdoor spaces will have luminaires to assure full cut off photometric to prevent light leakage into the Building while eliminating shadows. All outdoor spaces within the property will have a minimum average general illumination of 22 lux and a uniformity (average to minimum) of 4:1.

gg) The exterior of all entrances to be lit above 100 lux for wayfinding.

hh) Utilize vandal resistant and dark sky compliant exterior luminaires. Comply with

LEED requirements for light trespass and light pollution. Select and locate fixtures to provide uniform illumination levels on all surface areas avoiding shadows.

Install exam lights to meet the requirements of Appendix 2A Clinical Specifications.

jj) All Operating Rooms, Procedure Rooms, Trauma Rooms and MDRD luminaries will be:

IP65 rated UL certified IP65 per IEC 60598 and K230 rated;

Non-electronic interfering MIL-STD 461 F rated;

Provided with an antimicrobial finish.

kk) Provide LED 'Laser-in-Use' and/or 'X-Ray in Use' signs located outside any room in which a laser or X-ray is anticipated to be used. The sign will be connected to an internally illuminated switch inside the room with appropriate label. The switch will be interlocked with the equipment such that the equipment will not operate with the switch in the off position. Internal illumination of the switch will be on only when the sign is illuminated. Interconnect switch and door locks. Design will comply with Environmental and Workplace Health Safety Code 35.

ll) Refer to Section 9.3.18 Heliport for Heliport lighting requirements.

mm) Provide the Heliport vestibule with the ability to switch of all white light and illuminate the space with red light. This is required to avoid creating a glare/reflection issue for the helicopter crew and to maintain good visibility of the helipad at night from the vestibule.

nn) Provide recessed exam lights equivalent to Galuxy Birthing Room Lighting Systems (BRL-6618) complete with recessed enclosure for concealing the light within the ceiling.

oo) NICU

Lighting shall not shine directly on the infant. Overhead lighting shall be limited to adjustable exam lights Designed for procedures with all general lighting to be indirect and dimmable.

pp) Care Hub / Nurse Station

Provide locally controlled, overcounter, task lighting to minimise light trespass from the Care Hub during nighttime. Lighting may be integrated into the millwork.

Provide additional lighting to assist with patient and visitor wayfinding.

iii) Provide low glare overhead lighting for daytime operational requirements.

qq) Psychiatric Care

Utilize harm prevention luminaires throughout the Psychiatric Inpatient Unit. Provide recessed or surface mounted tamper resistant or vandal resistant type luminaires as directed by the Owner's operating staff and in accordance with applicable Mental Health Standards.

Tamper resistant type luminaires shall be durable with minimum 16-gauge housing, high impact resistant clear polycarbonate lenses (6mm thick), tamper-proof hardware and ligature proof when wall or surface mounted.

Institutional Vandal Resistant type luminaires shall provide a maximum

security & durable Construction with minimum 14-gauge housing, high impact resistant clear polycarbonate lenses (9.5mm thick), tamperproof hardware and ligature-proof when wall or surface mounted.

Provide night time lighting and motion sensors near exits of Psychiatric Inpatient units to enable people leaving the department to be identified on camera.

Provide washrooms with vandal resistant amber night lights installed at low level with photocell control such that when light are turned on in washroom, night light turns off automatically. Night light shall be located near the toilet and sink such that toilet and sink are visible without turning on ceiling light.

Lighting for Secure/Seclusion rooms shall be dimmable according to the applicable Mental Health standards and guidelines.

rr) Decorative Lighting

i) Provide recessed wallwash down lights and decorative lighting to highlight areas of the Facility as required by the Owner, including but not limited to:

- Main Entrances;
- Elevator lobbies;
- Atriums;
- Cafeteria;
- Waiting Rooms;
- Public and staff information displays.

ii) Provide task specific lighting to complement and accentuate artwork, donor walls and architectural features throughout the Facility. Coordinate such lighting with the Owner.

ss) Corridors

Provide low glare luminaires to provide maximum comfort to patients being transported by stretcher.

Locate luminaires and provide suitable dimming controls to avoid light trespass into patient sleeping rooms.

tt) Staff and Public Washrooms

Provide down lighting for general illumination and aesthetically pleasing, low glare vanity light above sink.

uu) An electrically powered LED "X-ray In Use" sign will be located outside any room in which fixed or mobile x-ray equipment is anticipated to be used, such as the OR. The sign will be connected to an internally illuminated switch inside the room label "X-ray". The switch will be interlocked with the x-ray equipment such that the equipment shall not operate with the switch in the "off" position. The "X-Ray In Use" sign will be interlocked with the doors to the Operating Room and the X-Ray machine will not function while the doors are open. Internal illumination of the switch will be on only when the "X-ray in Use" sign is illuminated.

vv) Lighting to support Infection Control

Provide luminaires that require minimal repeated cleaning and permit practical and easy access and disassembly. Install luminaires such that they will be easily accessible and maintainable by FMO.

Provide appropriate luminaires to support the Owner's infection control policies and procedures including minimising accumulation of dust and debris. Ensure that the luminaires can be washed with the Owner's cleaning solutions without damage to the finish.

ww) Refer to Section 7.6.23 Lighting control for control requirements for white tuning.

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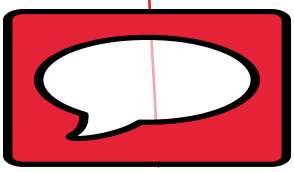

Basic Requirements

Provide electrical power, control and monitoring connections 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.

Electrical feeders to mechanical equipment will align with the redundancy considerations of the corresponding mechanical system or portion of the mechanical system serving an area.

Performance Criteria

Utilize institutional or industrial quality cables, connectors, conduit systems, fittings and hardware used to make connection to mechanical equipment so as to provide for high levels of reliability, durability and ease of maintenance of the equipment.

b) Design connections to mechanical equipment to easily permit removal and replacement of the equipment.

c) Size motor control centres, main feeders to motor control centres, and mechanical distribution centres to accommodate the current mechanical equipment with an additional 50% spare electrical and physical capacity.

Provide individual enclosed motor starters for individual motors. Utilize motor control centers when four 3-phase motors that require a starter are located within 50 m of each other.

e) Starters and MCC's to be indoor sprinkler-proof, NEMA Type 2 enclosures.

Motor starters will be combination of magnetic MCP (Motor Circuit Protector) type with integral control power transformers, Hand-Off- Auto (HOA) or start/stop control and at least two auxiliary contacts. Provide "power on" and "running" LED type indicators on each motor starter.

Provide combination starters for all motors 1/2 HP and larger that are not controlled by adjustable frequency drive or include an integral control package.

h) Motors rated 7.5HP or greater and provided with Variable Frequency Drives (VFD) will have an individual Passive Harmonic Filter connected on the line side of each VFD to limit the total harmonic current distortion (THiD) at the input terminals of the passive harmonic filter to:

less than 5% of the full load fundamental current of the motor when operating at full load;

less than 8% when the motor is 30% loaded.

Passive Harmonic Filter:

will treat all of the characteristic low frequency harmonics generated by a 3-phase, diode bridge rectifier load (5th, 7th, 11th, 13th, etc.);

will suppress the characteristic harmonics without the need for individual tuning or the requirement to phase shift against other harmonic sources;

will achieve harmonic mitigation by passive inductor/capacitor network. Active electronic components will not be used;

will never introduce a capacitive reactive power (KVAR) which is greater than 20% of its kVA rating to ensure compatibility with engine generators;

will not resonate with system impedances in the power distribution system nor attract harmonic currents from other harmonic sources.

Input line reactors and/or DC link chokes associated with VFDs will not be acceptable in-lieu of passive harmonic filters;

k) Provide the ability to demonstrate to the Participants at any time that there are no potentially harmful power conditions present and that equipment intended to guard against such conditions is in proper working order.

7.6.25 Major Medical Equipment

Basic Requirements

a) Provide all electrical requirements for connection, operation and monitoring and control of any supplied major medical equipment.

.2 Performance Criteria

Each item of equipment shall be installed and electrically connected in accordance with the manufacturer's requirements.

Electrical characteristics of this equipment, including voltage, wattage, phase, demand, inrush, frequency, connection method and control and monitoring requirements to be confirmed by the Participants and provided for.

Space, access and ventilation requirements and other operation critical characteristics of this equipment to be provided for and outlets and connection points to be located correctly for installation and so as to permit proper and safe isolation for servicing and disconnection for removal or replacement.

Any motorized equipment is to be equipped with a local lockable disconnect switch.

Where specified by the manufacturer, supply each piece of major medical equipment (imaging, procedure, OR) from a dedicated transformer.

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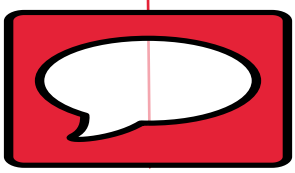

Basic Requirements

Provide a synchronized wireless Clock System to assure accurate, consistent time is available in the Facility. The system will provide automatic correction for daylight savings time and self-correct if power fails.

Provide master time controllers and all clocks by a recognized industry leader with all components by the same manufacturer.

.2 Performance Criteria

Install battery-operated analog type synchronized clocks that will receive correction signals from the master clock. Use batteries rated to last a minimum of 5 years.

Provide synchronized clocks minimum 300mm in diameter with sweeping second hand and 24 hour numbering. Numbering to include hours 1-12 in large numbers on outer ring and hours 13-24 in smaller numbers on inner ring.

All clocks located in Psychiatry patient accessible areas will have a clear high impact polycarbonate guard complete with tamperproof fastenings and centre pin rejection screws.

d) Locate analogue clocks to meet the clinical functions, including in the following space types:

Main Entrance / Foyer, Lobbies, Lounge, Waiting Area;

Conference Room, Office, Lockers, Meeting Room;

Workstation-Care Team Hubs/Nurse Stations, Medication Room, On-Call Room;

Intermediate care patient Areas, Quiet Room, Exam/Consultation Room, Treatment Room;

As directed by the Owner's operating staff through the Design review process.

Locate digital clocks in rooms and areas to meet the clinical functions, as directed by the Owner's operating staff Owner through the Design process.

Provide an elapsed time digital count up and count down timer in each Operating Room, Resuscitation/Trauma Room, Procedure Room and as directed by the Owner's operating staff through the Design process. The elapsed time clocks will include control pushbuttons to allow for interval timing and reset.

Provide local satellite transmitter such that the system is capable of providing sufficient coverage throughout.

g) Install main transmitter and satellite transmitters in TRs. Connect clock equipment to UPS power, complete with handle lock on device on the circuit breaker.

h) Locate synchronized clocks so that the faces are clearly visible to users in areas as required to ensure that staff are able at all times to view a clock when caring for patients, whether in a room or in transit.

In the event of a power loss, the control system will continuously maintain proper internal time.

7.7 Communications (Division 27)

7.7.1 Principles, Guidelines and Assumptions

Information Management and Information Technology (IMIT) are key enablers for modern health care service delivery.

.2 The Owner's IMIT team will provide leadership and direction as it relates to the Design and Implementation of IMIT applications.

.3 The IMIT responsibilities of the Owner and Participants are summarized in Appendix 2D IMIT Responsibility Matrix.

Provide systems and services which promote operational efficiency and integrate disparate systems where this integration provides efficiency, operational advantages, and/or cost savings.

.5 Participants will use the latest proven and reliable materials and equipment and the most current versions of any control or operating software approved by the Owner's IMIT team and available at the time of Construction.

The Facility is one component in the overall Owner network. The Facility will be an interconnected hospital as part of Owner's enterprise solution. The Participants will ensure that all new technology, systems, and equipment are compatible and seamlessly interfaced with the existing systems and equipment used by the Owner.

The Participants will consult with the Owner's IMIT team regarding the Design requirements in a collaborative manner and meet the Owner's policies and Standards for all connections to the Owner's wired and wireless networks.

.8 The Participants will ensure the Owner is not bound to any undesired proprietary solution, technology, service contracts, or maintenance agreements. Any such agreements or contracts must be explicitly presented to the Island Health Architectural Review Board (ARB).

.9 The Owner's IMIT team will provide and manage all firewalls and network security software for the Owner's networks.

A "Next Generation" electronic health record (EHR) is desired when it comes to gathering, storing and transmitting patient information. The intent of the EHR is to allow health care providers the ability to make more accurate, faster decisions on courses of action for patients, provide efficiencies for staff and patients to reduce costs, and provide better privacy and security of the patient record by controlling where it is stored. It is expected that the Facility will open at HIMSS stage 6 capability.

It is envisioned that all components of the next generation electronic health record will be developed and will be ready for deployment within the Facility. This goal has implications for the degree of automation of workflow, integration of systems and devices and overall reliance on the information system infrastructure that need to be supported.

.13 Applications will either be hosted on servers located at a remote Sites or locally within the Facility. The local Server Room (SR), any applications/systems installed therein, and the processes for maintenance of said systems are all subject to the Owner's defined Standards/requirements outlined in this Schedule and the appendices.

.14 The management of all the Owner's employees' and patients' information is the responsibility of the Owner.

.15 Except as expressly stated otherwise the Participants will be responsible for Designing and constructing all required infrastructure, servers and software required to support the IMIT and Security systems included within the Facility.

.16 The Participants will provide and maintain a detailed ceiling plan to ensure that the various elements competing for ceiling space are accommodated in a manner to minimise adverse impacts on each other (e.g. cameras, Owner WAPS, patient physiological WAPs, lighting, signage, speakers, patient lifts, etc.).

.17 Various Building systems will require the installation of the Owner Network equipment prior to commencement of commissioning. The Participants will schedule the installation of the Owner's property (including elements of the Owner's wired and wireless network and the patient physiological monitoring system) so that the property remains powered, secured, cool, clean and operational.

.18 The Participants are responsible to replace any of the Owner's equipment damaged by power fluctuations (such as powering off incorrectly), theft, physical damage by contact or by contamination prior to Substantial Completion.

7.7.2 Basic Requirements

The communications systems in the Facility will be an extension of the Owner's communications systems and must meet all of the Owner's Standards at the time of procurement. Participants will ensure that all new technology, systems, and equipment are fully compatible and seamlessly integrate with the existing systems and equipment used at the Owner.

.2 The communications systems will be proven technology for use in facilities similar to the Facility. Where requested by the Owner's IMIT team , the Participants shall provide evidence, including demonstrations, to the Owner's IMIT team that the proposed systems perform at an acceptable level at comparable healthcare facilities.

.3 Infrastructure provided by the Participants will:

Have high availability and redundancy that meets or exceeds the industry Standards for use in and support of acute care hospital applications;

b) Be easy to operate, maintain, and scale;

c) Support advancement towards an integrated Facility that continuously contributes to operational efficiencies through standardization, improved workflow and access to information;

Function in a safe manner and will not unduly impact Patient care and the operation of the Facility;

Be robust and resilient enabling the network to remain operational during and after disasters or in the event of a major network event such as core network equipment failure or fibre cut; and

f) Accommodate separate physical networks in accordance with equipment vendor specifications or where operational or security requirements dictate.

.4 Communication systems utilized in the Facility consist of multiple tiers of technical infrastructure and services applied in support of both clinical and non-clinical Owner services.

"Integrate" and "Integration" mean the combining of software or hardware components or both into an overall system that must be able to physically connect via a Standards based Interface to Owner systems if required to pass information, status, or extend system functionality. The individual systems are to function

together once integrated.

"Interface" mean the physical infrastructure, system components, software application development, configuration, messaging Standards, commissioning and testing necessary to perform data interchange between separate systems. Interfacing of systems will be provided to achieve the integration of systems which supports the overall clinical, operational and technical functional requirements. For each IMIT and Security system required for the Facility, this Schedule sets out a non-exhaustive list of other systems with which the system must interface with in order to achieve the technical, performance and functional requirements specified within this Schedule for the purposes of integrating into a complete system.

c) "Server": a server is a computer that provides hosting services for one or more applications including also acting as a data repository. Servers typically have additional processing capacity, memory, and data storage availability than basic or home computers. These requests between clients and servers are usually transported via standard TCP/IP network connectivity. Examples of server roles within the Owner system include: authentication servers, application hosting, data repository servers, web servers, utility servers, Building operation and life safety servers.

A summary of responsibilities for IMIT Systems and Equipment, including categorization of responsibility for Software and Server, Infrastructure and Interface responsibilities is included in Appendix 2D [Technology Responsibility Matrix].

.6 Participants will be responsible for:

Integrating all IMIT, Security Systems, and Equipment in accordance with Good Industry Practice with the overall Design of the Facility and will include such IMIT systems and equipment as part of the Design Development.

The Owner is interested in adopting a technology-based solution for enhancing wayfinding. Solutions will not replace conventional wayfinding provisions (i.e. kiosks, signage and floor markings), but will enhance public, patient and staff wayfinding to, from and within the Facility by use of technologies such as mobile-device based applications and portable smart devices.

7.7.3 IMIT Design and Construction Responsibility

System Design and Architectural Review Board

The Participants will Design all IMIT Systems, Security Systems and supporting infrastructure in conformance with the applicable industry telecommunications Standards plus the Owner technical Standards and integration, interfacing, performance and quality requirements as described in this Schedule and the Appendices to this Schedule. In the event of any conflict between Standards, the more stringent requirement will apply.

All IMIT and Security systems must be approved through regular Owner processes, including but not limited to the IMIT Architectural Review Board (ARB)

under the terms of Appendix 2E prior to development/implementation of the systems.

.2 System Procurement

If a system procured for use in the Facility represents a net new addition to the overall Owner systems inventory, Participants will ensure that any contract it enters into for that system includes provisions:

permitting assignment of the contract to the Owner on the same terms and conditions as included in the contract between Participants and the system vendor; and

allowing use of the system to be expanded beyond the Facility to other Owner Sites provided the associated increase of scope charges are paid.

b) The Participants will ensure that all of its contracts for supply of IMIT systems and equipment:

have a defined service level commitment that supports the Owner service level expectation as detailed in this Schedule; and

have a privacy and security schedule that aligns with the British Columbia Freedom of Information and Protection of Privacy Act/ Personal Information Protection and Electronic Documents Act legislation as applicable.

Applications, software modules, hardware, and any related software installed, operated or used by Participants must not interfere with the operation or performance of, or reduce the security or privacy of, any Owner applications or equipment.

System Development/Implementation

For development and implementation of all systems that will be Integrated with, or that Interface with the Owner's systems, Participants will comply with IMIT requirements and Review Procedure.

7.7.4 Telecommunications Infrastructure

Basic Requirements

Physical network Design and installation by Participants will have high availability and security that meets or exceeds the industry standard for use in and support of acute care hospital applications.

The following network separation will be provided in the Facility:

the Owner's network (data, voice, video);

patient physiological monitoring systems;

Facility Maintenance;

BMS;

nurse call system;

public address system;

vii) patient entertainment system;

distributed antenna system; and

BC Ambulance .

Participants will consult with the Owner and comply with all of the Owner's policies and Standards for all connections to the Owner's network. The above list is indicative only and does not limit Participants' obligation to provide all physical separate networks required for the Facility.

The communications systems will accommodate all media types, including data, voice, video and public address.

Train the Owner on configuration/setup and testing of the communication systems equipment in the Facility.

Design and install equipment and infrastructure to remain operational during and after disasters.

g) Provide all necessary infrastructure, including power, pathways, conduits, spaces and structured cabling, to support UBC's clinical academic program as outlined in Appendix 2A Clinical Specification and Appendix 2F UBC FACULTY OF MEDICINE DESIGN GUIDELINES AND FUNCTIONAL REQUIREMENTS.

Performance Criteria

Provide infrastructure for the communications network as detailed in Appendix 2E IMIT Technical Specifications.

IP Protocol will be used for data, voice, and video network based equipment. Telecom equipment will be a mix of VoIP and analog equipment.

c) All network protocols will be IPv4 or IPv6 compatible as determined by the Owner.

Participants will maintain the manufacturer's warranties on all communications systems equipment and ensure that the warranties are assignable to the Owner.

e) All networked equipment provided by the Participants intended for integration with Owner networks/systems will include any adapters necessary to integrate with the Owner's IP based network.

f) Participants will provide redundant copper and fiber telecommunications services via physically diverse and redundant pathways. Outside plant cable infrastructure will be continuous and terminate in the redundant entrance Facility rooms. Participants will perform all work (including providing all necessary parts and components) required to connect to the Owner's IMIT infrastructure. Participants will terminate all fibre and copper cables as directed by the Owner. See Appendix 2E IMIT Technical Specifications.

g) Participants will provide the fibre patch cables for actual network connectivity.

Participants will provide all necessary hub-harnesses and cross connect all copper cabling. The Participants will provide the Owner's IMIT team a list of all data drops in the Facility, identifying WAPs and Cameras, the Owner's IMIT team will then provide a list of cross connects to be made. All data drops to be cross connected by the Participants.

.3 Quality Requirements

Participants will:

use the latest technology available, as approved by the Owner, at the date of procurement of the communications system for the Facility;

use equipment and materials that are certified by CSA or ULC or other testing agency approved and accepted by the Local Inspection Authorities; and

adhere to all Standards and specifications identified in Appendix 2E IMIT Technical Specifications.

In the event of any conflict between this document, applicable industry Standards, Appendix 2E IMIT Technical Specifications, or reference Standards, seek clarification from the Owner before proceeding.

7.7.5 Site Utilities / Telecommunications Service Provider

.1 Participants will coordinate the Design of the Facility with the Owner's telecommunications service providers to achieve two physically diverse, redundant telecommunications services to the Facility. The redundant services will not share a common duct bank, overhead transmission pole, or fire compartment before entry into two separate entrance facilities.

For additional redundancy, the telecommunications services will originate from separate central offices or separate telecommunication providers. Redundant services shall not share a common duct bank or overhead transmission pole on the Facility property. The first overhead transmission pole upstream of the Facility shall likewise not be shared between the redundant services.

The following table indicates required telecommunication services to Entrance Facility A and B:

Cable Type	**From**	**To**
Copper	Telus	EF-A
Copper	Shaw	EF-A
Fibre	Telus	EF-A
Copper	Shaw	EF-B
Copper	Telus	EF-B
Fibre	Shaw	EF-B

.4 Participants shall coordinate all telecommunication services to the Facility in accordance with the Owner's service agreements.

Participants must comply with the telecommunications service provider installation Standards and be compatible with the Owner's telecommunications infrastructure. In the event of conflicting requirements consult the Owner's IMIT team for direction.

7.7.6 Telecommunication Equipment Rooms

Basic Requirements

Participants will provide telecommunication equipment rooms to accommodate the telecommunications infrastructure and equipment in accordance with the Owner Standards Appendix 2L [IMIT Technical Specifications] and EIA/TIA-1179 Standards. In the event of any conflict between this document, Appendix 2L [IMIT Technical Specifications], or reference Standards, this document shall govern.

"Telecommunication equipment room" includes the following room types: Entrance Facility Room (EF), Server Room (SR), Primary Equipment Room (PER), Secondary

Equipment Room (SER) and Telecommunication Room (TR).

Locate PER and SER to minimize the possibility of both rooms being adversely impacted simultaneously (including impact resulting from flood, fire, vandalism, mechanical or structural failure). The PER and SER may not be located on the same floor and must be separated by at least 50m horizontally. Neither the PER nor the SER may be located below grade.

Minimum Design requirements for the telecommunication equipment rooms will comply with Appendix 2E IMIT Technical Specifications. Provide and size telecommunication equipment rooms to accommodate the telecommunications requirements of the Facility, including all required equipment racks, cabling systems, all active and passive network equipment, devices and infrastructure, and future growth.

Provide all structured cabling between all telecommunication equipment rooms as per Appendix 2E IMIT Technical Specifications.

Entrance Facility Room (EF) – an entrance to a Building for both public and private service cables including the entrance point of the Facility and continuing to the entrance room. The Entrance Facility Room accommodates the joining of inter and intra Facility telecommunications infrastructure.

g) Provide two EFs (EF-A and EF-B) to service the PER and the SR, each to be provided as specified for an EF in Appendix 2E IMIT Technical Specifications to accommodate the two physically diverse, redundant telecommunications services to the Facility.

h) Locate EF-A and EF-B to minimize the possibility of both rooms being adversely impacted simultaneously (including impact resulting from flood, fire, vandalism, mechanical or structural failure).

All telecommunication equipment rooms must provide sufficient cooling capacity to permit all racks to be fully populated with a total load of 3kW of conditioned power per rack and maintain a satisfactory network equipment operating temperature.

j) All telecommunication equipment rooms must provide a minimum of 3kw of fully redundant power from both the UPS and conditional power systems to each rack.

o) The maximum quantity of data drops per TR is 1,320. The Owner's IMIT team will review and approve the layout and configuration of each TR.

p) End-use equipment will be connected to the TR switch and run on Category 6A twisted pair.

q) All network ports will be activated.

r) TR's shall be sized in accordance with Appendix 2E IMIT Technical Specifications.

s) The GigaBIX wall in each TR will physically segregate separate networks such as data, nurse call, and physiological monitoring. Refer to Appendix 2E IMIT Technical Specifications.

t) Equipment Racks

Multiple types of equipment rack will be installed in telecommunication equipment rooms. These will include network racks, voice gateway racks, fibre racks, biomed racks, Facility systems racks, IMIT racks, and server racks.

Except as noted otherwise, all racks will be provided with floor space per Appendix 2E IMIT Technical Specifications.

iii) The voice gateway racks, fibre racks, biomed racks, Facility systems racks, and IMIT racks will be two-post types.

The network racks and server racks will be four-post types.

Provide network racks in the PER, SER, and SR. These racks will be extra-wide to accommodate a core network switch and cable management. These racks will be directly seismically anchored to the floor.

All server racks, unless otherwise specified, will be mounted on seismic isolation bases. The platforms will be bolted together and seismically anchored.

Provide each voice gateway, biomed, Facility systems and IMIT racks with sufficient quantity of rack mounted electronic power distribution units (ePDU) and to accommodate all rack mounted equipment. ePDU's will be Designed for switching non phase synchronized AC power sources. The ePDU will monitor both power inputs and providing

a fast switch transfer from 120Vac UPS power to 120Vac Conditional power source without interruption.

Each server and network rack will include redundant ePDU's connected to separate L15-30R-208V (3 phase) circuits, one on UPS, the other on Conditional power. Each ePDU will be capable of supporting C13, C14 and C19 power connections.

7.7.7 Structured Cabling

Basic requirements

All structured cabling will be Designed, installed and tested in accordance with Appendix 2E IMIT Technical Specifications.

b) The cabling infrastructure will be universal and support the networks and systems required in the Facility, including voice (VOIP and analog), data, video, RTLS, video surveillance and security systems and to allow all forms of end-use equipment, including computers, telephones, video conferencing equipment and other digital end-use equipment, access to the various IT, telecommunication, and digital video networks.

c) Participants will cause:

the cabling infrastructure to be Designed by an RCDD;

the RCDD to work with the Owner's IMIT team to complete the physical network Design; and

the RCDD to assist the Owner's IMIT team to develop a network plan (which would include all active network devices and each separate network). Participants will assist the Owner's IMIT team in the network plan by supplying all necessary information to the Owner's IMIT team about Facility networks. The Facility systems network equipment is, whenever possible, to match the network equipment specified by the Owner.

Participants will provide preliminary conceptual drawings of proposed telecommunications outlet locations in advance of the first detailed room review meetings with the Owner.

e) As part of the Design process, described in Schedule 7 - Design Plan provide detailed plans including risers, rack layouts, telecommunication equipment layout, infrastructure, raceways, expansion space, elevations of telecommunication equipment room walls including BIX wall layouts in each of the SR, PER, SER, and TRs.

f) Participants will test all cable infrastructure in accordance with Appendix 2E IMIT Technical Specifications and in consultation with the Owner.

Provide and install a complete structured cabling solution for the Facility in accordance with Appendix 2E IMIT Technical Specifications.

h) Provide separate physical networks, in accordance with equipment vendor specifications and in consultation with the Owner, as required for the telecommunications systems and equipment installed or used in the Facility. At a minimum, provide a separate physical network for each of the networks identified in Section 7.6.9.

In consultation with the Owner, Design and provide physically diverse and redundant pathways between the SR, PER, SER and TRs.

Telecommunication Outlets and Data Drops

In this Schedule and the Appendices to this Schedule, the terms "telecommunication outlet", "data outlet" and "communications outlet" are used interchangeably. Notwithstanding any standard referenced in this Schedule, all such outlets included in the Facility will:

- include a minimum of two data drops (both active) with each "data drop" comprising a complete Category 6A structured cabling connection between the RJ45 outlet jack and the port on a network switch;
- comply with all requirements set out in Appendix 2E IMIT Technical Specifications.
- have a minimum conduit size as defined in Section 7.7.2.1(8) serving an outlet box as defined in Section 7.7.2.3;
- include a maximum of 4 port cover plates with RJ45 jacks as required to terminate the supplied cabling, plus blank filler plates on unused outlets;
- use Category 6A termination technique. No differentiation will be made between data and voice cables.

All horizontal cables will be terminated on GigaBIX termination hardware located in a TR. Provide harness cabling for each horizontal cable and connect through to the corresponding switch port.

Provide a minimum of one spare data drop at each telecommunication outlet, except as indicated in Appendix 2E IMIT Technical Specifications.

Participants will, in consultation with the Owner, assign each room and space in the Facility a work area data drop density ("High", "Medium" or "Low") in accordance with the ANSI/TIA-1179 Healthcare Facility Telecommunications Cabling Standard Table 1. Notwithstanding the quantities defined in ANSI/TIA-1179, Participants will provide a minimum quantity of data drops as defined below:

- Low Density Work Area – provide 2-6 data drops;
- Medium Density Work Area - provide 9 data drops;
- High Density Work Area - provide 15 data drops.
- No Data Area – 0 data drops are required for the following TIA 1179 defined work area types: 'Janitor Closet', 'General Storage', 'Circulation Space', 'Alcove', ' and Locker Rooms / Showers' except as may be required by Section 7.7.7.

Participants will provide additional data drops in excess of the minimum quantity required by Section 7.7.7 as required:

- to support all of the networks, systems and equipment (including the Equipment) to be installed or used in the Facility;

- to comply with Appendix 2E IMIT Technical Specifications; and
- to provide convenience, flexibility of use and operational support throughout the Facility.

Participants will Design each room in the Facility such that data drops are distributed throughout the room as required to support clinical functionality and convenient use of equipment by Facility Users.

Participants will co-locate, at each telecommunications outlet location, an appropriate number of power outlets.

Terminate all cables in TRs in accordance with Section 7.8 of this Schedule and Appendix 2E IMIT Technical Specifications.

l) The Owner's IMIT team will provide the analog gateways, for which Participants will provide appropriate racks, UPS, power, cooling and connectivity in each of the PER and SER.

m) All raceways will have spare capacity at least as per Appendix 2E IMIT Technical Specifications.

n) For each GigaBIX cross-connect wall, provide adequate space to accommodate 50% expansion on the same and adjacent wall. All communications rooms will have physical floor and wall space to accommodate such expansion.

o) Telecommunications outlets will be provided in ceiling spaces for wireless network access points, cameras, information display systems, and other ceiling mounted digital devices. Location of telecommunication outlets must be readily accessible in ceiling spaces.

p) Comply with the equipment and cabling labelling Standards per Appendix 2E IMIT Technical Specifications. Confirm details with the Owner's IMIT team prior to labelling.

q) Provide floor telecommunications outlets and floor power to connect floor mounted self-registration systems, meeting rooms, electronic directional systems and patient education kiosks, as approved by the Owner.

r) Provide a data outlet for all courtesy phones in consultation with the Owner.

7.7.8 Equipment

Facility Systems Equipment

Provide all end use equipment and communication equipment as necessary to provide a fully operational Facility.

Do not connect any of the Facility systems equipment to the Owner's network, both wired and wireless, without prior approval from the Owner. Any additional cost incurred by the Owner for Participants' use of Facility systems equipment on the Owner's network will be treated as Alliance costs. The Owner's IMIT team will accommodate any of the Participants End-Use Equipment that has been approved for connection to the Owner's network.

d) Any wireless devices used by Facility systems will not interfere with the Owner's wireless infrastructure or devices.

The Owner wishes to have a single communications infrastructure but where

required this infrastructure may be physically separated with approval of the Owner's IMIT team.

Facility systems will be supplied with all software updates and patches prior to Substantial Completion, and throughout the duration of the Defect Correction Period

.2 Owner's End-Use Equipment

The Owner will provide its own end-use equipment including:

i) computer, desktop;

computer, laptop;

tablet PCs;

printer laser, multifunction;

photocopiers;

vi) facsimile machines, general: facsimile, multifunction;

healthcare card readers;

dictation microphones;

scanner, barcode;

registration kiosks;

xi) PDAs;

telephone, desktop, digital, multiline;

cart, medication with computer;

xiv) dispenser, medication (host) and dispenser, medication, lock module and dispenser, medication, mobile;

xv) computer, desktop;

xvi) printers, label;

xvii) scanner, barcode;

xviii) handheld computer devices;

xix) monitor, blood glucose;

xx) television, flat panel;

xxi) bed, residential, single; bed birthing; bed, electric; bed, electric, Bariatric;

xxii) pump, infusion, single; pump, infusion, controller, modular; pump, enteral; pump infusion, PCA;

xxiii) device integration for real –time clinical assessment and physiological data documentation;

xxiv) digital room signage and digital way-finding;

xxv) Cerner connectivity engine;

xxvi) Connexall connectivity engine;

xxvii) multifunction communication devices; and

xxviii) telehealth clinical devices; (collectively, the "Owner Supplied End-Use Equipment").

Participants will:

include the installation of the Owner Supplied End-Use Equipment as part of the Move-in Schedule;

assist the Owner's operating staff to define locations for the Owner supplied end-use equipment;

provide adequate space, infrastructure, power, and wired network data outlets for the Owner supplied end-use equipment; and

iv) provide jack number information (on the Owner's cable information Excel spreadsheet) to the Owner to facilitate placement of the Owner supplied end-use equipment.

7.7.9 Owner Network

Basic Requirements

For the Owner's network and Patient Physiological monitoring and Telemetry system, the Owner's IMIT team will:

provide to Participants network switches for installation by Participants;

complete all logical network Design (excluding structured cabling) and network equipment programming and configuration; and

be responsible for all network management licensing.

For the Owner's network and patient monitoring network, Participants will:

install all network switches and connect harness cabling;

ii) complete all physical network Design and provide all structured cabling; and

iii) provide the Owner's IMIT team with POE requirements for any device the Participants is connecting to the Owner switches, in excess of 802.3af (15.4W). Quantities and locations of POE devices and corresponding TR rack shall be identified during the appropriate planning phase.

For all other networks required in the Facility, Participants will:

provide all required network equipment, including network switches;

in consultation with the Owner, complete the logical network Design and program and configure all network equipment;

be responsible for all network management licensing; and

locate network and other equipment in the PER, SER, or TRs.

For all of the networks described above, the Participants will mount and connect all network switches, harness cables, and cross connect and test all network equipment and cable infrastructure per Appendix 2E IMIT Technical Specifications and in consultation with the Owner.

Participants will provide and install harness cables for all network switches for all networks plus spare capacity, per Appendix 2E IMIT Technical Specifications.

Participants will provide patch cords for all network switches for all networks, per Appendix 2E IMIT Technical Specifications.

g) Install all network equipment in accordance with all applicable IEEE and EIA/TIA Standards, including the 802.1 and 802.3 Standards.

The Owner's IMIT team will provide and manage all firewalls, security and IDS/IPS systems for connections to all networks.

Retain a vendor certified network engineer trained on the Participants' network equipment.

j) Redundancy and security will be incorporated in all network Designs.

7.7.10 Owner Servers

Basic Requirements

Owner servers will be installed in the SR by the Owner.

Participants will ensure that all Servers will align with Owner policies and operational procedures with regards to security and operations.

Servers will meet minimum "Lights out" requirements where all servers will have remote access cards and data outlets for remote management and support.

Performance Criteria

Participants will provide infrastructure (including structured cabling) per Appendix 2E IMIT Technical Specifications to support each server rack with the required network and power redundancy.

7.7.11 Facility Systems Servers

Basic Requirements

All Servers must align with Owner policies and operational procedures with regards to security and operations in accordance with this Schedule and its Appendices. This includes aligning to the Owner operating system and hardware patching processes.

Servers will meet minimum "Lights out" requirements using ILO or similar technologies.

Servers will be the latest technology, as of the date of installation (Intel processor latest model or similar acceptable to the Owner) and will interface to the Ethernet network via a copper 1/10Gb network interface card. Other interfaces may be acceptable subject to consultation with the Owner.

d) All Servers deployed must align with the Owner's Standards for procuring equipment including hardware models, operating systems, software licenses, maintenance and contract agreements. All agreements for the life cycle of the hardware and or application must be transferred to the Owner.

Performance Criteria

Each server will require network and power redundancy by means of dual power supplies and dual NIC cards installed in each server. Each power supply will be connected to separate redundant rack PDU's and each network card would be connected in consultation with the Owner.

All network attached Servers will include the installation and management of Antivirus software that aligns with the Owner's antivirus policies.

All network attached servers will include the installation and management of enterprise data backup and retention software that aligns with the Owner's Backup and Retention policies and procedures.

Hardware and software configuration of servers provided by the Participants must be reviewed and approved by the Owner's Architectural Review Board (ARB).

Servers for the technology and communication systems will have an operating system supported by the Owner.

7.7.12 Telephone Equipment

Basic Requirements

a) Design and construct the Facility including infrastructure per Appendix 2E IMIT Technical Specifications to support the Owner's VoIP, EOC Satellite telephone, and patient telephone systems.

Participants will install Owner-supplied wall mounted phones in consultation with the Owner.

c) The patient telephone system will utilize the Owner's VOIP system.

Performance Criteria

See Appendix 2E IMIT Technical Specifications.

7.7.13 Cellular Services and Distributed Antenna System (DAS)

Basic Requirements

Participants will provide all infrastructure and equipment required to support a 5G singular distributed antennae system (DAS) that will universally support the following cellular service providers: Telus, Bell, and Rogers.

b) Ensure that the system installed supports both cellular voice and data requirements. The system will function effectively in all areas of the Facility, including parking.

Participants will work with the Owner's IMIT team and the cellular service providers to coordinate a transfer of the contract to the Owner upon Substantial Completion.

The DAS is a Facility system.

Locate DAS equipment in TRs, PER, and SER, provide all cabling as per Appendix 2E IMIT Technical Specifications.

7.7.14 Owner Wireless Networks

Basic Requirements

In consultation with the Owner Design and install a complete 802.11 wireless network solution for the Facility in accordance with Appendix 2E IMIT Technical Specifications to support the extension of the Owner wireless network into the Facility. The Owner currently utilizes a single Owner wireless network that extends across all its facilities and a patient physiological monitoring wireless network.

Participants will not install any other 802.11 wireless network in the Facility.

The wireless network in the Facility will have sufficient wireless access points to support the Wireless Staff Communication system in accordance with Vocera Standards to a level of -60db at 12mw.

Refer to Section 7.8.20.1(9) regarding use of the Owner's 802.11 wireless network by the RTLS system in the Facility.

The Owner will:

procure, configure, maintain and refresh Wireless Lan Controllers (WLC) or latest equivalent to support the Owner's wireless network within the facilities.

procure, program and configure wireless access points and provide to Participants for installation.

maintain the existing Connected Mobile Experience (CMX).

Participants will:

install all structured cabling, wireless access points, Wireless Lan Controllers (WLC), and test all cable infrastructure and wireless system devices for the wireless network in consultation with the Owner. Install all network equipment in accordance with Appendix 2E IMIT Technical Specifications.

ii) retain Professional Services of a certified Cisco partner to configure and program the CMX to include the Facility floor plans including wireless access point locations mapped to a floor plan with RF characteristics defined for structural composition which will include glass, concrete, wood, drywall, metal, and permanently mounted RF obstacles.

procure and install all necessary mounting hardware for the WAPs to be mounted in the correct orientation.

g) Provide a complete structured cabling infrastructure that will allow the installation of the complete wireless network. Participants will install telecommunication outlets and access points in consultation with the Owner. Note that the patient physiological monitoring wireless access points will be installed by the Participants independently from the Owner wireless network.

h) Retain the Professional Services of a certified Cisco partner to test all aspects of the wireless network and provide heat maps for the Facility indicating the channel coverage, signal level, data rate and noise floor for 802.11 standard including 802.11b, 802.11g, 802.12A and 5GHz 802.11n wireless networks.

.2 Performance Criteria

Retain a RCDD certified network engineer with expertise and experience in working with the Owner approved equipment to Design the wireless network.

Each wireless access point will have a singular data drop terminated at a telecommunication outlet installed in accordance with Appendix 2E IMIT Technical Specifications.

Design the Facility including equipment locations (e.g., microwave ovens) that does not interfere beyond the noise floor and signal strength requirements (including signal to noise ratio) of the wireless network. The resulting RF environment in the Facility must be consistent with the strictest specifications of the wireless end-use equipment.

The wireless network will provide 100% coverage that meets the Owner's performance requirements, as described in Appendix 2E IMIT Technical Specifications, throughout the Facility including elevator cabs, mechanical spaces, service areas, stairwells, and secured exterior courtyards and gardens.

7.7.15 Staff Communication System

Basic Requirements

The Owner's wireless network will support a complete wireless staff to staff communication system.

The staff communication system will allow staff to initiate 2-way voice conversations from their staff communication system device to:

i) other staff communication system devices; and

VoIP telephone.

The staff communication system will allow staff to receive 2-way voice conversations into their staff communication system device from:

other staff communication system devices;

VoIP telephone;

nurse call consoles;

nurse call patient stations;

nurse call staff/duty station; and

vi) external telephone.

The Owner will provide all wireless end-use devices and centralized staff communication services.

f) Participants will provide all required licences and Professional Services to program, integrate, and commission the system.

g) Participants will ensure that all required systems integrate with the staff communication system. At the Owner's discretion, some of the system integration may be performed through the Owner's phone system.

h) The staff communication system will function throughout the Facility including elevator cabs, mechanical spaces, service areas, stairwells, and secured exterior courtyards and gardens.

.2 Performance Requirements

Provide adequate space and power outlets for wireless device charging stations and UV cleaning stations inside each department, taking in to account that charging units with multiple devices may cause signal concentrations that impact active unit performance. Sufficient spread of units must be maintained for both charging and storage areas so as not to impact operational performance of active units.

Interface Requirements

Fixed Duress, Staff Duress, Owner Network, Intercommunications, Patient Wandering, Infant Protection, Nurse Call.

7.7.16 Public Address (PA) System

Basic Requirements

The PA system is intended for emergency situation voice paging and code calls only. Other communications systems will also be used for routine communications between staff and patients.

The PA system shall be capable of:

Live voice paging from a telephone handset;

Live voice paging from a microphone station;

Broadcast of pre-recorded messages; and

iv) Emergency code messages with pre-tone announcement.

c) The PA system is to be considered a mission critical system and shall be constructed for a high level of reliability and resiliency. The system shall use a distributed architecture with no single point of failure.

d) The PA system shall not rely on the Owner network for operation. Provide a dedicated independent network for all PA system components.

The PA system will be separate from and act independently of the fire alarm voice paging system. Interface the PA and Fire Alarm System to establish the required interlocks and delays required by code and applicable Standards.

Performance Requirements

Provide complete speaker coverage throughout 100% of the Facility in consultation with the Owner's IMIT team so that emergency voice pages can be heard everywhere in the Facility (including outbuildings), with high intelligibility and low loss of articulation of consonants (%ALCONS).

In terms of meeting minimum sound level requirements, assume that smaller areas such as offices will have their doors open and speakers will typically be located in adjacent corridors.

c) Coordinate with the Owner's IMIT team during Design to provide additional speakers in rooms where it cannot be assumed that the doors will remain open.

Provide sound levels as follows throughout the Facility:

Normal voice paging: 60 dB minimum.

ii) Voice paging sound levels will be at least 10 dB above ambient noise levels in mechanical rooms and similar locations.

e) Adjust speaker tap settings during commissioning to achieve a level of intelligibility that is acceptable to the Owner. Where necessary provide additional speakers.

f) Provide all equipment necessary for a fully operational public address system, including:

PA System controllers with:

- digital signal processing;
- ambient noise compensation;
- non-volatile pre-recorded message storage (50+ custom message files); and
- Multiple call handling with call prioritization.

PA system network switches (dual channel between PA controllers) with all associated modules and cabling;

70V paging amplifiers;

Flush mounted ceiling speakers with backboxes in finished areas, with adjustable taps (0.25W – 4W);

Surface mounted ceiling speakers with enclosures in finished areas, with adjustable taps (0.25W – 4W);

Trumpet type speakers in mechanical and other high ambient noise locations;

Microphone stations (rack mounted and remote);

Mixers;

Telephone/network system interfaces; and

x) Fire Alarm System interface modules.

g) All PA system rack components shall reside in a Facility Systems Rack in a TR and shall be supplied with UPS power.

Provide a laptop computer for PA system diagnostics and maintenance purposes. Each PA system rack shall have a computer tray for mounting the laptop computer. The laptop shall be capable of being relocated to any Facility System Rack and performing system-wide maintenance.

Provide two amplifiers per output channel. Size amplifiers to handle total connected load plus 40% spare capacity. Each amplifier shall supply alternating speakers in a zone such that upon loss of one amplifier or associated circuit, 50% of speakers shall continue to operate. Provide one spare amplifier in each array of amplifiers and identify as 'Spare'.

Provide physical rack space to expand the quantity of amplifiers by 25%.

k) Where possible, co-locate PA speakers with fire alarm speakers in ceiling systems. Provide additional speakers as required to satisfy performance requirements.

l) Speaker circuits shall be supervised such that ground faults, short circuits or open circuits shall report the specific zone trouble condition to the PA system.

m) Each speaker zone shall utilise an ambient sound level microphone for adjusting sound output from the speakers (i.e. increase for noisy times and decrease at quiet times).

n) The PA system shall automatically test each paging zone on a daily basis by means of a high frequency signal which is inaudible to humans. The system shall identify any zone which fails this test and latch a PA system trouble relay.

o) All PA system components will be continually self-supervised such that a failure of any component shall cause a common trouble relay to operate. This trouble relay shall be monitored by the Fire Alarm System as a supervisory input and shall be annunciated by the Fire Alarm System. Provide an additional auxiliary dry contact for monitoring by a remote Owner system.

p) Provide, in consultation with the Owner, an interface to the telephone system. The integration will facilitate single-step dialing from a telephone handset directly to a paging zone. This will accommodate the speed-dial functionality from the Owner's standard telephone handset. This functionality will be achieved without utilising a SIP trunk.

q) Provide a data outlet at each PA system location for a telephone for diagnostic purposes.

r) The PA system shall experience no greater than a 1 second delay between initiating a voice page and its transmission.

Provide physical zoning of the PA system by department to enable each department to page itself, if so desired. Confirm configuration of physical and logical paging zones with the Owner's operating staff during Design.

t) Voice paging will typically be performed via a telephone located at an Owner Switchboard.

u) Provide a hard-wired, goose-neck type, PA system microphone station at three separate locations to be advised by the Owner's operating staff in the event that the Facility telephone system fails. This backup microphone must be able to select individual paging zones or perform an all page call.

.3 Interface Requirements

Owner Network, Fire Alarm.

7.7.17 Intercommunication System

Basic Requirements

Audio-Video and Audio-only Intercom systems are required at select locations throughout the Facility.

Provide all required integration between Intercom systems and Access Control and the Telephone System.

c) Intercommunication system is considered a Facility system.

.2 Quality Requirements

a) The intercom systems will be manufactured by recognized industry leaders in the intercom business, and is subject to approval by the Owner.

Performance Criteria

The intercom systems will utilize SIP devices on the Owner network registered to separate and dedicated intercom call manager cluster.

Provide an audio-video intercom door-station at all department public entrances, all inpatient department entrances, all delivery locations, and Pharmacy entrance locations in consultation with the Owner, and based on the Facility Threat and Risk Assessment.

c) Each department will have master stations at each collaboration station, reception, and/or care hub. Calls from the door-station will be broadcast to each master station simultaneously and may be answered from any of these locations. Any master station will be capable of releasing the entrance door. Master station locations will be determined in consultation with the Owner.

d) The intercom system will be capable of escalating/directing door calls to mobile and static staff devices for voice communication and door unlock functionality.

Coordinate the provision of video intercom systems for all other areas with the Owner.

Door stations will be provided as follows:

i) full colour surveillance camera with ability to pan and tilt;

hands-free full duplex audio capability;

Supplementary call buttons at accessible heights;

SIP enabled; and

vandal resistant and weatherproof where required.

g) Master stations will be provided as follows:

capable of being desk and wall mounted;

full colour display screen with ability to control pan and tilt of door station;

Adjustable volume levels;

iv) handset and hands-free full duplex audio capability; and

capability to release to the secure entry door.

h) Audio-only Intercom systems are required in medical imaging rooms and associated control rooms.

i) Intercoms for clinical use will be a separate stand-alone closed system or isolated using tenanting in the call manager. Clinical use intercoms will support 2-way audio only communications with push-to-talk functionality. Provide clinical use audio only desk/wall mount loud-speaking master station with handset at locations as determined in consultation with the Owner, including:

each imaging control room; and

pharmacy dispensing area.

j) Provide clinical use wall/ceiling mount loud-speaking master station without handset at locations including:

Fluoroscopy radiography rooms;

ii) IV mixture areas; and

Pharmacy compounding areas.

Provide dedicated duplex voice intercom system between each Seclusion room and the local nurse station. Nurse station will have the capability of turning the volume down, or up, as required. Intercom will be hands free in the Seclusion room and will be ceiling mounted behind an anti-ligature guard. Provide a separate voice station outside the room.

All Intercom systems will not be capable of recording audio, video, or still images of callers.

.4 Interface Requirements

Access Control, Telephone system, staff devices

7.7.18 Video Conferencing and Telehealth

Basic Requirements

All videoconferencing systems will interface with Owner's videoconferencing infrastructure and systems as identified in this section.

Provide the supporting infrastructure including power, telecommunication outlets, audio-video wiring, raceways, outlet boxes, structural requirements necessary to deliver the Telehealth requirements identified in Appendix 2G VIHA AV Specifications.

Not Used

As identified in the Appendix 2G VIHA AV Specifications, Design and construct video conference capable rooms and locations within rooms in accordance with Appendix 2F UBC FACULTY OF MEDICINE DESIGN GUIDELEINES AND FUNCTIONAL REQUIREMENTS and Appendix 2G VIHA AV Specifications.

Retain audio visual professionals with expertise and experience in the application, use and integration of audio/video conferencing systems for the Design, configuration and integration of the required videoconference rooms and systems.

Quality Requirements

a) Audio quality will be comparable to voice quality found in typical PSTN voice networks. Video quality will be high definition (min 1080p) and synchronized with the audio content. Video conference systems will allow for adjustments of compression and audio and video quality to accommodate for bandwidth management.

Performance Criteria

Design and construct videoconference rooms and locate microphones, video cameras, video monitors, lighting systems and sound attenuation structures/materials to optimize the performance of the video conferencing systems.

Coordinate with the Owner's IMIT team for network access. Video conferencing systems will be configured in consultation with the Owner's IMIT team and adhere to the Owner security and quality of service requirements so not to negatively impact the Owner's network performance in any way.

The Design of the videoconferencing system shall accommodate a flexible use of the space, including partitioning of the room and the deployment of an EOC.

7.7.19 Real Time Location System (RTLS)

.1 Basic Requirements

In consultation with the Owner, Design and install a complete RTLS solution for the Facility that includes the following applications and systems:

i) asset tracking;

wireless staff duress;

iii) Patient Wandering;

infant protection;

environmental monitoring;

staff to patient interactions with automatic association to the EHR;

staff presence within an inpatient room with automatic association to the nurse call system; and

staff workflow analysis and reporting.

RTLS will utilize a server and allow multiple workstations to access the system for supervision, control and reporting purposes. Each of the above applications and

systems will have a dedicated customized monitoring and reporting interface for each of the following departments:

protection services (local offices and central dispatch);

biomedical department;

logistics department (Equipment Depot);

pharmacy department;

Facility Maintenance department; and

Clinical departments (IPU Collaboration stations, MHAS, HAU/ICU, ED, Medical Imaging).

Participants will coordinate with the Owner's IMIT team to ensure that departmental tracking/dashboard displays in each department listed above are capable of displaying real-time location mapping of RTLS- tagged staff, patient and equipment.

All data points within the RTLS will be capable of being retained for the purposes of reporting for a minimum of 30 days.

All components of the RTLS system, including all use cases, must be supervised with highly available infrastructure and cannot rely solely on the Facility Wi-Fi. All field devices including tags shall be supervised and monitored.

g) Provide the following quantities of RTLS tags and/or licenses for:

200 Patient Tags (this does not include infant tags, but does include patient wander tags);

50 Infant Protection Tags;

750 Staff Duress Tags;

50 Environmental Monitoring Tags;

1250 Equipment tags; and

vi) 20 Instant Notifier licenses.

The Owner's existing 802.11 wireless network is Designed to maximize use for voice and data (with emphasis on the staff to staff communication system). Participants may use the Owner's wireless network for the RTLS in the Facility, subject to the following conditions:

Participants will not be permitted to add to, modify, reconfigure or tune the Owner's wireless network to facilitate use by the RTLS system; and

use of the wireless network by the RTLS must not negatively impact the Owner's wireless network.

Provide all middleware, hardware and professional services required to interface the RTLS-based systems with all Owner required systems as defined in Schedule 1.

k) Provide a complete structured cabling infrastructure that will allow the installation of the complete RTLS network, including access points, exciters, and/or ultrasonic receivers if applicable.

l) The RTLS system will provide 100% coverage throughout the Facility including

elevator cabs, mechanical spaces, service areas, stairwells, and secured exterior courtyards and gardens.

.2 Performance Criteria

The RTLS must provide the following functionality:

identifying and tracking equipment and asset location, patient location, and staff duress location within the Facility by:

- floor;
- room;
- zones within rooms; and
- 3m radius.

ii) all entry/exit locations to the Facility must have an RTLS array capable of detecting a tag in close proximity and generating an alarm;

all entry/exit locations to each Inpatient Unit, and as required by the Owner, must have an RTLS array interfaced with the access control system such that a 'lock-down' of a door based on tag credentials can be initiated automatically;

patient tags must be non-line of sight and must work when covered with bedding, pant legs, and shirt sleeves;

the RTLS system will provide absolute detection of tags within elevator cabs. Provide additional exciters in each elevator cab to ensure adequate accuracy;

vi) alerting and reporting based on patient location, patient proximity to location, and patient duration in location;

vii)

the RTLS will interface with the nurse call system, and this interface will support the 'staff presence' functionality of the nurse call system and will provide automatic normal call acknowledgement when a RTLS tagged staff member is within 1.5m of the patient in treatment/procedural area or inpatient room;

reporting on tag and RTLS infrastructure (excluding WAPs) health and availability;

reporting and alerting on duress tag button press;

xi) ping rates of different tag types will be determined by the Owner's IMIT team on a use case basis;

xii) tags must be cleanable within the Owner's infection control Standards;

xiii) tags must support configuration in "always on" mode;

xiv)

xv) wireless staff duress tags must support bi-directional communication and have a visual alerting option (LED on tag);

xvi) environmental monitoring tags must support bi-directional communication; and

xvii) tags must have multiple attachment options, including chest pocket clip, integration with patient wrist bands, and staff ID badge lanyards.

Design the RTLS to include features that assist the Owner to achieve the highest possible tag recovery rate.

Provide a PC based application (departmental tracking/dashboard displays) that will provide a presentation of tags by superimposing positional data on a Facility floor plan and providing tag based information.

Interface Requirements

a) Owner's Network, Wireless Network, Nurse Call, Cerner, elevators, Patient Wandering, Infant Protection, Environmental Monitoring, Staff Communication, Staff Wireless Duress, Asset Tracking, Integration Engine.

7.7.20 Asset Tracking

Basic Requirements

a) Provide an RTLS based asset tracking system, in compliance with Section 7.7.19 (Real Time Location System).

The Asset Tracking system will be capable of interfacing with a Computerised Maintenance Management System (CMMS) for use by FMO and Biomed.

.2 Performance Criteria

a) The Asset Tracking System will be capable of locating and tracking a particular piece of equipment anywhere within the Facility with room level accuracy.

b) Participants will provide a PC based application in consultation with the Owner's operating staff that will provide a presentation of equipment Tag locations by superimposing positional data on a Facility floor plan and providing equipment tag-based information.

Provide departmental tracking/dashboard displays in the Equipment Depot, Biomedical, and FMO that are capable of displaying real-time location mapping of RTLS-tagged equipment.

to send an alarm if a particular piece of equipment passes through a door that leads to the exterior of the Facility.

alerting for RTLS tagged assets based on:

- location within the Facility;
- movement into Laundry collection points;
- movement through Facility exits;
- PAR leveling, ie. quantity of devices or lack thereof within a

given location/area in the Facility (for example a low number of wheelchairs or a large number of infusion pumps requiring cleaning);

- status of a tag (low battery, failure).

Asset Tracking tags will have a barcode label affixed for the purpose of interfacing the tag, and related equipment information into the CMMS.

Asset tags dirty/clean status will be updated automatically by passing through choke points in the equipment depot. A strobe light located at the entrance to the depot will provide indication of tag operation.

Interface Requirements

a) RTLS.

7.7.21 Patient Wandering System

Basic Requirements

Provide an RTLS based Patient Wandering system, in compliance with Section 7.7.19 (Real Time Location System).

The Patient Wandering system will provide staff with the ability to:

Quickly locate elopement risk patients;

Prevent elopement by automatically locking unit doors while still allowing patients to wander on the unit;

Further prevent elopement by alarming on unit exit and Facility exit.

c) Provide all system components (e.g. gateways and exciters) as required to achieve the Patient Wandering system functionality as described herein.

Patients may be provided with RTLS tags/bracelets, ID bands, badges, or wrist/ankle bracelets. Patient tags will not have wireless duress functionality. Patient tags will have a tamper band providing notification if the tag is tampered with or cut.

Performance Criteria

The Patient Wandering system will be capable of locating and tracking a patient anywhere within the Facility.

b) Participants will coordinate with the Owner's IMIT team to ensure that departmental tracking/dashboard displays in each Clinical and Psychiatry Department, and Protection Services are capable of displaying real-time location mapping of RTLS-tagged staff and patients. Patient tag locations will be displayed on a graphical display board at the care hubs.

Participants will provide a PC based application in consultation with the Owner's operational staff that will provide a presentation of patient tag locations by superimposing positional data on a Facility floor plan and providing patient tag-based information.

x) Upon a patient tag leaving the unit, the tag location will be continuously updated with current location;

xi) an alarm event shall require staff to manually clear the alarm state in the Patient Wandering application. The access control on the impacted door will revert back to its previous scheduled state;

Client workstations for activation and management of Patient Wandering tags will be located at the care hubs.

Each care hub utilizing the Patient Wandering system will be provided with a wireless Patient Wandering tag test device that audibly and visually indicates on a pass / fail basis on the functionality and battery life of the Patient Wandering tag. The testing device will be a closed loop device/station that allows for full functional testing without activating the Facility's Patient Wandering alarm system and will provide audit function as required.

At all entry/exit locations to the Facility and at each unit provide an RTLS array that is capable of determining proximity to a secure door. This functionality will be interfaced with the corresponding access control system such that a 'lock-down' of a door can be initiated automatically. Patient Wandering protected doors will not be in close proximity to planned "wander loops".

h) The Patient Wandering system shall be Designed such that protected door detection fields are located/directed away from patient rooms to prevent false door alarms during typical patient behavior/movement. Provide shielding as required.

j) Code blue team and Protection Services access control cards will override a door or elevator locked by the Patient Wandering system.

Interface Requirements

RTLS, Access Control, Staff Communication System, Nurse Call, elevators.

7.7.22 Infant Protection System

Basic Requirements

Provide an RTLS based infant protection system, in compliance with Section 7.7.19 (Real Time Location System). Provide an infant protection system to identify and control the location and mobility of pediatric patients in all areas of the Facility.

The Infant Protection system will provide staff with the ability to:

i) Quickly locate an infant protection tag anywhere in the Facility;

Prevent abduction by automatically locking unit doors;

Further prevent abduction by alarming on unit exit and Facility exit.

Patients will be provided with an infant protection tag based upon patient

age/weight/size.

.2 Performance Criteria

The infant protection system will be capable of continuously identifying and tracking an infant or paediatric patient anywhere within the Facility.

In the event of Owner Network failure, the infant protection shall continue to operate in an offline mode.

d) Participants will provide a PC based application in consultation with the Owner's IMIT team that will provide a presentation of infant protection tag locations by superimposing positional data on a Facility floor plan and providing infant protection tag-based information.

At all entry/exit locations to the Maternity and Pediatric Units will provide an RTLS array that is capable of determining proximity to a secure door. This functionality will be interfaced with the corresponding access control system such that a 'lock-down' of a door can be initiated automatically. Control points will not be in close proximity to planned walking loops.

The infant protection system will interface with all elevators such that the elevators will not operate when an infant protection tag is present in the elevator cab. The elevator inhibit feature will not operate when the infant protection tag is in transport mode.

g) The infant protection system shall be Designed such that protected door detection fields are located/directed away from patient rooms to prevent false door alarms during typical patient behavior/movement. Provide shielding as required.

After infant protection tag leaves the department perimeter door zone, the door will revert back to its previous scheduled state and the alert tone will be deactivated.

Infant protection tag management (including alarm acknowledgment and reset) will be administered at local workstations or remotely by Protection Services.

j) The infant protection system will integrate with the Radio System to automatically broadcast voice messages to all protection services radios. The voice message will indicate the specific department exit door from which the call was initiated, or that an infant protection tag removed or tamper event has occurred. Provide all middleware and converters required to interface the Radio System with the infant protection system.

l) After an alert or alarm condition has been cleared all doors shall return to the regular (pre-alert/alarm) scheduled status.

Infant Protection tags must have a service life of 24 months in a typical usage scenario.

Infant Protection tags must be non-line of sight and must work when covered with bed sheets and clothing.

o) Each department utilizing the infant protection system will be provided with a wireless tag test device that visually indicates on a pass / fail basis the functionality and battery charge level of the device. The testing device will be a closed loop device/station that allows for full functional testing without activating the Facility's infant protection system and will provide audit function as required.

.3 Interface Requirements

a) RTLS, Access Control, Radio System, Staff Communication system, Nurse Call, elevators.

7.7.23 Wireless Staff Duress System

Basic Requirements

Provide an RTLS based wireless staff duress system, in compliance with Section 7.7.19 (Real Time Location System).

The wireless staff duress system will supplement the installation of the fixed duress system for reliable and dependable operation under all operational and environmental conditions. The wireless staff duress system will not be affected by or interfere with any equipment in use in the Facility.

c) Staff will wear staff duress system tags. Tags will have a single button that activates a call to Protection Services for Code White response.

Tags are to be worn on a lanyard or clipped to a chest pocket.

The staff duress system will provide 100% coverage throughout the Facility including secure courtyards, elevator cabs, mechanical spaces, service areas and

stairwells. The Owner does not require the wireless staff duress system to function outside of the Facility perimeter.

.2 Performance Criteria

The staff duress system will be capable of locating and tracking a duress tag anywhere within the Facility with a continuous location update during alarm.

Tag location update interval shall no greater than 10 seconds during alarm state. During non alarm state, the tag update interval shall be configurable.

c) Participants will provide a PC based application in consultation with the Owner's operating staff that will provide a presentation of staff duress tag locations by superimposing positional data on a Facility floor plan and providing staff tag-based information.

Provide a wireless staff duress system that provides the following functionality:

Creates an alarm state for staff based on operation of the staff duress tag pushbutton;

staff duress location tracking must update continuously once activated;

iii) the system will interface and integrate with the fixed duress system such that the system annunciates an alarm from either system in a consistent manner. See Section 7.9.5 (Fixed Duress System);

iv) Upon the initiation of an alarm, and in consultation with the Owner, the system will have the capability to activate visual and audible devices to alert staff of the event;

v) The system will integrate with the staff communication system such that when a staff member activates a staff duress tag, the event will be transmitted to the staff communication system as determined by the Owner. Provide all middleware, and hardware required to interface wireless staff duress system with the staff communication system.

vi) The system will integrate with the Radio System to automatically broadcast voice messages to Protection Services radios in the Facility. The voice message will indicate individual room and/or zone location from which the staff duress call was initiated. Provide all middleware, and hardware required to interface wireless staff duress system with the Radio System.

vii) Each department utilizing wireless duress, including but not limited to Emergency, Medical Imaging, Laboratory, Pharmacy, Psychiatric Emergency Services (PES), Inpatient Units and all other areas as defined by the Owner, will be provided with a wireless duress tag test station that audibly and visually indicates on a pass / fail basis the functionality and battery life of the tag. The testing station will be a closed loop device/station that allows for full functional testing without activating the Facility's staff duress system and will provide audit function as required.

.3 Interface Requirements

RTLS, Radio, Staff Communication.

7.7.24 RTLS Environmental Monitoring

Basic Requirements

Provide an RTLS based environmental monitoring system, in compliance with Section 7.7.19 (Real Time Location System).

The RTLS environmental monitoring system will not be affected by or interfere with any equipment in use in the Facility.

The RTLS environmental monitoring system will provide real-time alerts to address environmental and physical changes in all clinical refrigerators and freezers.

The RTLS environmental monitoring system will provide alarming, alerting, reporting and analytics for regulatory compliance.

Performance Criteria

The RTLS environmental monitoring system shall monitor temperature, humidity, voltage and dry contact sensors.

Participants will provide a PC based application in consultation with the Owner's IMIT team that will provide a presentation of RTLS environmental monitoring tag locations by superimposing positional data on a Facility floor plan and providing Environmental monitoring tag-based information.

The RTLS environmental monitoring tags shall have a battery life of at least 12 months under normal operating conditions.

The RTLS environmental monitoring tags shall store up to 2 hours of data at 15-minute intervals if Wi-Fi is unavailable.

Interface Requirements

RTLS.

7.7.25 Patient Entertainment and Education System

.1 Basic Requirements

The patient entertainment and education system will provide patient, visitor, and staff audio and video content.

b) Not used.

The Participants will be responsible for Design and provision of the supporting infrastructure including the power, data, and wall backing and ceiling supports to mount 65" smart TV's.

Areas requiring ceiling mounted supports are likely to include:

ICU patient rooms;

Ambulatory and Public Waiting rooms;

Lobbies;

Cafeteria;

Staff Gym;

Emergency Operations Centre; and

Areas as defined by the Owner.

The Participants will procure, deliver and install the wall, ceiling and bed mounting brackets for the TVs for installation.

The Patient Entertainment and Education system will both utilize the same display and audio. User controls for these systems will not necessarily be the same.

g) Provide all physical pathways, interconnections, and interfacing to support control of the Patient Entertainment and Education system from the smart bed. Provide all necessary wiring and integration to deliver audio signals to the nurse call pillow speaker and/or smart bed speakers.

h) In consultation with the Owner, Patient Entertainment outlets will be installed areas including, but not limited to:

each inpatient bed location;

each patient / public waiting areas and lobbies;

iii) patient and staff lounges;

iv) staff gym;

cafeterias;

Emergency Operating Centre;

vii) On Call and Doctors' sleeping rooms, and

Other areas defined by the Owner.

Patient Entertainment and Education is considered a Building system.

Performance Criteria

A patient entertainment outlet consists of a duplex receptacle, and two data outlets. A patient entertainment outlet will serve a smart TV. All patient entertainment outlet cabling will be connected to the closest TR.

The patient entertainment and education system will operate over a physical network other than the Owner's network. All patient entertainment and education system rack components shall reside in a Facility Systems Rack in a TR and shall have a separate dedicated BIX field.

In all private inpatient bed locations patients will control content including channels, programming, and volume.

In semi-private inpatient bed locations, smart TV audio will be connected to the smartbed speakers and/or nurse call pillow speaker.

At patient entertainment locations other than inpatient bed locations, Owner's operating staff will control the channels/programming via remote control and will be able to change program channels and volume.

.3 Interface Requirements

Smartbeds, Nurse Call.

7.7.26 Nurse Call Systems

Basic Requirements

The nurse call system will utilize the latest proven technology used in healthcare facilities similar to the Facility.

Provide a Nurse Call system of the most current version approved by the Owner.

The nurse call system in a smart hospital environment is a hub for interfacing technologies and systems. Incorporate in the planning, Design and installation the multiple virtual and physical interfaces, and pathways that are required to support

an integrated patient-centric system. In addition to the interfacing of systems, physical pathways, interconnections and interfacing are also required to support lighting and blind control from the smart bed, and control of the patient entertainment/education system from the smart bed.

Prior to Designing and installing the nurse call system and as required by the Owner, coordinate the technical capabilities of the nurse call system, hardware interface and integration requirements, system layout, and functionality with the Owner's IMIT team and the Owner's clinical staff.

Train the Owner's operating staff on the nurse call system; training schedule to be determined in consultation with the Owner.

Provide a full feature audio and visual nurse call system with full duplex communications in any and all patient use and patient care areas/rooms/units of the Facility as noted in Appendix 2A Clinical Specifications.

The nurse call system will be:

the primary communication path for patients to contact staff in each clinical use and patient care area; and

the primary communication path for Owner's operating staff to alert other staff that they need assistance.

Nurse call is considered a Facility system.

Quality Requirements

Comply with all applicable Standards, including UL1069.

.3 Performance Criteria

Interface the nurse call system with other systems in a seamless manner to achieve the integrated functional requirements as determined in consultation with the Owner.

The nurse call system will fully interface with Owner systems to enable bi-directional communications and transfer of all required data.

c) Integrate the nurse call system with the Owner network and provide sufficient audio channels, in consultation with the Owner, for the requirements of the Facility.

The nurse call system will provide the full range of software applications available for use in large acute care facilities. The applications will include but not be limited to system administration and supervision, staff assignment and messaging, staff tracking and presence, workload and workflow management, and statistical reporting.

The nurse call system will have the capability to allow Owner systems to access all data from the nurse call system for the purposes of reporting and analytics.

All data within the nurse call system will be capable of being retained for a minimum of two months.

Provide network separation of the nurse call system. Provide all network equipment for the nurse call system and integrate this network, in consultation with the Owner, with other networks.

Utilise manufacturer's recommended cabling standard and connectors for nurse call cabling, as applicable.

Install nurse call gateways and switches in Facility racks located in TR's. All nurse

call cabling will be installed in accordance with the Appendix 2L [IMIT Technical Standards].

The nurse call system will annunciate on the wireless staff communication devices for near instant alarm response as a secondary alerting system. The nurse call system will operate seamlessly with the wireless staff communication devices and allow two-way VoIP communication into all compatible patient locations.

k) The nurse call system will utilize VoIP communications between all major components including consoles, patient stations, staff/duty stations and all telephones and staff communication devices.

l) In consultation with the Owner, provide consoles in each department/unit providing patient care (including Indigenous Health Services and specimen collection) including but not limited to nurse stations, care hubs and unit clerk stations.

Consoles will be colour, touch screen, user configurable, soft key enabled, hands-free full duplex capability with handset for private conversations.

n) Consoles will have the capability to redirect all calls to other staff consoles on a manual, automatically scheduled, call escalation, or console failure basis.

o) Provide adequate staff/duty stations for each nurse call system to ensure that tones are heard throughout each department providing patient care (including Indigenous Health Services). Provide the capability to mute each event at each staff/duty station.

p) Patient stations will be installed in all patient use and patient care areas or rooms of the Facility as noted in Appendix 2A Clinical Specifications.

q) In each Inpatient room provide the following, in accordance with Appendix 2A: Clinical Specifications:

one patient station with audio for each bed location;

one call cord station for each patient chair location;

one patient washroom station with audio;

iv) one lavatory station with pull cord; and

one shower station with pull cord.

r) Patient stations will be individually programmable to allow multiple call classification and priority levels. Patient stations will be capable of connecting two call cords and/or auxiliary alarm inputs. Provide the ability to disable any nurse call system input from any staff console.

s) Where smart beds are planned, the nurse call patient station will fully interface with the full range of smart bed call and audio functions.

t) Audio from the Patient Entertainment and Education system will be connected and audible through the smart bed speakers and/or pillow speaker.

u) The nurse call system will provide an interface such that the smart bed is capable of controlling patient headwall lighting.

v) Provide call cords for each patient station plus 10% spare.

w) Pillow speaker type cords will be provided for each patient station in semi-private rooms. Provide 10% spare. Selection of pillow speaker will be determined by the Owner.

x) Patient stations located in psychiatric areas will have a suitable physical barrier or enclosure that enables staff to prohibit access to the patient station, and shall conform to anti-ligature Standards.

y) Provide emergency pull cord stations in all patient washrooms, changing room locations, and public washrooms as directed by the Owner.

z) Provide emergency pull cord stations in the All Nations / Healing Rooms.

aa) Pull cords will be washable and compliant with the Owner's infection control policies.

bb) Provide multi-call classification dome light (minimum 4 LEDs) to annunciate staff presence or calls in all rooms containing nurse call devices. Locate dome lights in positions that optimise staff's ability to quickly identify the origin of a nurse call event. Provide zone lights as required to quickly direct staff from anywhere within or outside the unit to the origin of the call.

cc) Provide code blue stations at locations determined in consultation with the Owner, including but not limited to:

each area as identified in Section 7.8.28.1(6) including:

- patient care areas;
- nurse stations, Care Team Stations and Care Hubs;
- Morgue;
- patient lounges; and
- Reception.

dd) In consultation with the Owner, develop the Code Blue response protocol for each department.

ee) Each code blue team member will have the ability to recall any elevator from any elevator lobby by means of an elevator recall keyswitch located on the elevator hall call station. The code blue team will assume control of the elevator by means of a code blue keyswitch located inside each elevator cab.

Interface requirements:

Owner network, staff communication system, RTLS.

7.7.27 Integration Engine

Basic Requirements

The Integration Engine in a smart hospital environment is a hub for interfacing technologies and systems. Incorporate in the planning, Design and installation the multiple virtual and physical interfaces, and pathways that are required to support an integrated patient centric system. The Integration Engine will interface systems, physical pathways, interconnections, and software connections.

c) Prior to implementation of the Integration Engine, coordinate the configuration and functionality of the Integration Engine, hardware interface and integration requirements, system layout, and functionality with the Owner.

d) Programming, configuring, interfacing, testing and commissioning of the system will be to the satisfaction of the Owner.

.2 Performance Requirements

Provide all necessary licensing including topology, integration and alarm point licenses required for the Facility.

Provide all auxiliary connection hardware as required.

Interface Requirements

7.7.28 Patient Physiological Monitoring and Telemetry

Basic Requirements

The Owner has standardized on the Philips patient physiological monitoring system and Philips Vital Signs Monitors.

The patient physiological monitoring system comprises the following:

Fixed patient locations for physiological monitoring and vital signs monitoring; and

Telemetry (wireless) system for physiological monitoring.

c) Participants will provide all infrastructure required to support the patient physiological monitoring system.

The Owner will provide the patient physiological monitoring system equipment, including physiological monitoring system wireless access points, network switches, wireless controllers, and routers. The Owner will supply the wireless access point enclosures.

e) Participants will coordinate with the Owner's Biomedical and IMIT team to determine locations of wireless access points required to support the dedicated, independent wireless infrastructure associated with the patient physiological monitoring system. Participants will install infrastructure and wireless access point enclosures.

f) Participants will Design the Facility including equipment locations (e.g., microwave ovens) so that it does not interfere beyond the noise floor, signal strength requirements, and signal to noise ratio of the patient physiological monitoring system's wireless network. The resulting RF environment in the Facility must be consistent with the strictest specifications of the wireless end-use equipment.

g) Telemetry (wireless) systems for physiological monitoring systems will be installed in but not limited to each of the following departments:

Emergency Department;

ICU/Telemetry Unit;

Cardio-Pulmonary;

Pre and post surgical areas;

Medical Imaging;

Medical Surgical;

All public and patient areas plus all connecting corridors between these Departments (excluding stairwells, elevators, and MRI suites).

h) Alarms will annunciate at bedside monitors and the central stations unless the patient is monitored only on a telemetry monitor. A patient on a telemetry monitor will have his/her alarms annunciate only at the central station. Locations of central and remote alarm stations to be determined in consultation with the Owner.

Performance Criteria

Patient physiological monitoring system servers will be located in the SR.

TR's will contain dedicated Biomed racks for the patient physiological monitoring system equipment including PoE switches, synchronisation units and network switches.

c) All care hub patient physiological monitoring and telemetry components will be provided with UPS power.

All bedside monitors at ICU/Telemetry and Emergency Department will be provided with UPS power. All other bedside monitors will be provided with Vital power.

Provide a telecommunications outlet at each headwall in each department identified in Section 7.7.28.1.g above.

Provide 2 telecommunication outlets at each care hub in each department identified in Section 7.7.28.1.g above.

g) Provide a telecommunication outlet with a single data drop located inside each patient physiological monitoring system wireless access point enclosure.

h) The Owner will supply the mounting hardware for the patient physiological monitors and vital signs monitors. Participants will coordinate with the Owner's Biomedical and IMIT team and install the mounting hardware for the patient physiological monitors and vital signs monitors in locations including but not limited to care hubs, patient rooms, surgical, and Procedure Rooms. Headwalls and ceiling-mount boom arms must be compatible with the mounting hardware supplied by the Owner. Participants will provide adequate backing to support all mounting hardware.

i) Participants will coordinate with the Owner's Biomedical and IMIT team and install a complete speaker system at locations required to meet audibility requirements for the patient physiological monitoring system. Participants will provide all infrastructure including provision of communications and power. The Owner will supply the patient physiological monitoring speakers and mounting hardware.

Participants will coordinate with the Owner's Biomedical and IMIT team and install remote display systems at locations as required by the Owner's Biomedical team. Participants will provide all infrastructure including provision of communications and power. The Owner will supply the patient physiological monitoring remote display systems and mounting hardware.

The patient physiological monitoring system will interface with the Nurse Call system via the patient station auxiliary equipment jack.

.3 Interface Requirements

Nurse Call, Staff Communication System.

7.7.29 Post-Disaster Design Criteria

.1 Design the communication systems and equipment to meet or exceed the BC Building Code requirements for a post-disaster Facility.

.2 Design the communication systems and equipment to comply with the following requirements:

Provide all communication services and equipment required to support the EOC, per Section 5.3.

Provide a high density of data outlets to accommodate the equipment identified in this section, plus additional outlets to support operational flexibility and adaptability;

Have data drops supplied from two separate TR's on a 50/50 basis;

Have 12 Telus 1B lines provided from two separate TR's on a 50/50 basis connected to switching box/device that allows automatic switching from Telus 1B phone line to satellite phone communications for all phones;

Six workstations will each have:

- 3 telecommunications outlets;
- 2 Telus 1B phone lines;
- Satellite phone capability for each of the Telus 1B phone lines.

The Communication Equipment Room will have two workstations; each workstation will have:

- 3 telecommunications outlets;
- 2 Telus 1B phone lines;
- Satellite phone capability for each of the Telus 1B phone lines.

The following emergency radio communications equipment will be stored adjacent to the EOC for rapid deployment:

- 1 commercial antenna;
- VHF Radio System, consisting of 1 digital antenna and 1 voice antenna;
- HF Radio System, consisting of 1 digital antenna and 1 voice antenna;
- Satellite phone system;
- Commercial Radio Systems; and
- FMO/PS Radios.

Provide all required raceways and cabling for the emergency radio communications equipment between the EOC and Radio Systems Tower, plus 25% spare.

viii) Provide communication services to the Mass Casualty Kiosk as follows:

- One 50 pair Cat 5 analog telephone trunk lines (terminated on BIX) from each of the PER and SER for connection to Telus 1B lines;
- 4pr SM fibre and 4 pr MM fibre from each of the PER and SER fibre patch panel;
- Twenty four Cat 6 data drops from the nearest Telecommunications Room. Maximum cable distance for Cat 6 will be 70 metres. Terminate on kiosk patch panel;
- Space for provision (by others) of a 48 port 19" CISCO network
- Switch and a 1.5kVA UPS; and
- CATV trunk cable (terminated at an 8-port splitter) from each of the PER and SER. CATV will be connected to provide cable TV to the kiosk.

7.7.30 Communications Tower

Basic Requirements

Provide a Communication Tower to accommodate all radio type system antenna and equipment including all structural supports and fasteners, all electrical, lighting, and lightning grounding requirements, and all enclosures, entrances, ducting, pathways, and cabling.

Locate Communications Tower and all other antennae so that they do not interfere with Heliport operations. Position one or more (as may be necessary) Communication Towers in locations which achieve satisfactory performance of the radio systems identified in 7.7.30.2(a).

Perform a radio study to ensure that antennae mounted on the Communication Tower are at an acceptable height and orientation to facilitate satisfactory communication with offsite facilities in located Victoria, Campbell River, Comox, Nanaimo and Vancouver.

.2 Performance Criteria

The Communications Tower will accommodate antenna for the following systems and have 25% space provided for future expansion:

Zetron Voice Paging

Radio System

Helicopter Communications (Air to Ground, Aerodrome lighting)

VHF Radio System, consisting of 1 digital antenna and 1 voice antenna

v) HF Radio System, consisting of 1 digital antenna and 1 voice antenna

Satellite phone system

Commercial Radio System

FMO/PS radios

ix) Telecomms Utilities antenna

x) Distributed Antenna System (DAS)

RCMP Repeater

Local HAM Radio Repeater

xiii) CVRD Public Safety Team Repeater

Interface Requirements

Radio, Zetron, EOC Communications equipment (Satellite phones, HF, VHF, etc.), cellular telephone, third party equipment (HAM radio, RCMP, CVRD, Helicopter Communications)

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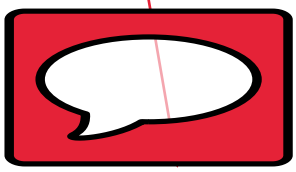


Facility Protection Services offices. Each client workstation will be equipped with 2x27" monitors.

The Owner will provide a large format wall mounted event monitor in the Protection Services office.

k) The Owner will provide single monitor client workstations in the emergency department, PICU, and heliport vestibule. Provide access groups to facilitate limited viewing privileges of specific cameras for these areas.

All video surveillance system devices will reside on the Owner's network configured on the security camera VLAN.

m) Video surveillance cameras will be Avigilon (the most current version or production model), and of the following specifications:

Indoor cameras will be fixed type, capable of facial identification, colour, high-resolution (minimum 2MP), high sensitivity (day/night), single or multi-imagers, smoked dome type with an auto iris and zoom capability. Mounting will be appropriate for the environment, unobtrusive, matching colour with hidden cabling. Fixed cameras will be wall mounted, ceiling mounted, and / or mounted at protective locations and heights.

Indoor cameras in small public waiting areas, medication rooms, elevators, and areas smaller than (4m x 4m) will be fisheye type, capable of recognition, high-resolution (minimum 12.0MP), high sensitivity (day/night), horizontal angle of view of 180 deg hemisphere, field of view 360 deg, vandal proof, digital PTZ. Mounting will be appropriate for the environment, unobtrusive, matching colour with hidden cabling. Fixed cameras will be wall mounted, ceiling mounted, and / or mounted at protective locations and heights. Fisheye type cameras are not to be used for identification.

Outdoor fixed cameras will be colour, high-resolution (minimum 2MP), high sensitivity (day/night), with wide dynamic range, smoked dome type with auto iris and zoom capability. Mounting will be appropriate for the environment. Exterior cameras in excess of 80m from the TR will require external power supplies and / or fibre media converters.

Outdoor PTZ cameras will be pan-tilt-zoom (PTZ) colour dome cameras, capable of observation, high resolution (minimum 2MP), smoked dome capable of minimum 30x optical zoom, high-speed with low light day/night operation capability with 360 degrees rotation in less than 3 seconds. PTZ cameras will be programmed with patterns and presets. Domes will mount on poles, parapets and walls located to provide optimum unobstructed viewing of the area under surveillance. PTZ cameras will have the ability to mask portions of view through software and remote programming. Exterior cameras in excess of 80m from the TR will require external power supplies and / or fibre media converters.

v) Outdoor cameras will be complete with weatherproof housing, sun shields, bird spikes, and internal heater as required for suitable operation under varying environmental conditions.

n) Video Surveillance cameras will not be set up in private areas such as patient rooms, treatment rooms or clinical areas (unless specifically identified for use by clinical department staff), locker rooms or washrooms. Cameras will not be placed or reviewed for the purpose of observing work performance of employees.

o) Locate video surveillance cameras to avoid signs and other ceiling mounted devices obstructions.

p) Position cameras to minimize possibility of reflection including glare created by bright light sources, both natural and artificial.

q) Camera field of views to be Designed, configured, and commissioned in consultation with the Owner.

r) Provide video surveillance equipment to monitor and record the identity of all persons entering and exiting the Facility's entrances, corridor/links, utilizing elevators, and in strictly controlled high risk departments and associated areas, as identified in consultation with the Owner.

The term "identification" means capturing a target's face with cameras providing images of 80 pixels per foot (horizontal).

t) The term "recognition" means capturing a target with cameras providing images of 40 pixels per foot (horizontal).

u) The term "observation" means capturing a target with cameras providing images of 20 pixels per foot (horizontal).

v) Provide video surveillance cameras at locations determined in consultation with the Owner, including:

Identification at all entrances to the Facility;

Identification at all entrances to departments;

Identification at all PER, SER, and SR entrances – recording to be continuous 24/7;

Identification in strictly controlled high risk areas (Pharmacy/narcotics vaults/Perinatal);

Identification in gift shop;

vi) Identification at all cash offices and areas where cash is exchanged;

Identification of license plates entering the property;

Recognition of all MHAS areas and Secure Outdoor spaces (100% coverage);

Recognition at all entrances/exits to and major corridors in LDRP and Paediatrics;

x) Recognition of all major corridor intersections;

Recognition in PER/SER/SR (100% coverage, including between aisles);

xii) Recognition in all TRs;

xiii) Recognition in all public lobbies, waiting areas, and reception;

xiv) Recognition in all medication rooms;

xv) Recognition at entrance to the Heliport;

xvi) Recognition at cafeterias;

xvii) Recognition at emergency generators;

xviii) Recognition at main Electrical Room;

xix) Recognition at all entrances to the Service Centre;

xx) Observation of Heliport and flight path quadrants (100% coverage);

xxi) Observation of PER, SER, and Server Room approaches;

xxii) Observation of emergency department (100% coverage excluding treatment areas);

xxiii) Observation of all patient registration/admitting and information desks;

xxiv) Observation of all public thoroughfares and walkways;

xxv) Observation in all stairwells;

xxvi) Observation of all pay parking stations;

xxvii) Observation at all Loading Docks;

xxviii) Observation of all parking lot drive lanes;

xxix) Observation of all EV charging stations;

xxx) Observation of all parking lot duress stations;

xxxi) and areas Designated as high risk by the Owner.

w) The video surveillance system will integrate with the intrusion alarm system such that when an intrusion alarm is activated the cameras in the area of the alarm will be automatically displayed at the Protection Services client workstations.

x) The video surveillance system will integrate with the Infant Protection system such that when an infant protection alarm is activated the cameras in the area of the alarm will be automatically displayed at the Protection Services client workstations.

y) The video surveillance system will integrate with the access control system such that door forced/held alarms in high risk areas as determined by the Owner's operating staff will trigger associated cameras to be automatically displayed at the Protection Services client workstations.

z) The video surveillance system will integrate with the Patient Wandering system such that cameras in the area of a Patient Wandering alarm will be automatically displayed at the Protection Services client workstations.

aa) The video surveillance system will integrate with the staff duress and fixed duress systems such that selected cameras in close proximity to a duress alarm will be automatically displayed at the Protection Services client workstations.

bb) All integrations must have bypass functionality to disable camera cueing during system testing/verification/maintenance.

Interface Requirements

Owner's Network, Infant Protection, Access Control, Patient Wandering, Staff Duress, Fixed Duress, elevators, Intrusion Alarm.

7.8.6 Clinical Video Surveillance System

Basic Requirements

Provide a clinical video surveillance system. Provide point-to-point cameras and viewing monitors for clinical purposes (these are not security cameras) at locations described in the Clinical Specifications.

Recording is not required unless otherwise stated in the Clinical Specifications.

Clinical video surveillance is considered a Facility system.

The Clinical cameras will be separate from the Facility Video Surveillance system for patient privacy. Clinical cameras are not to be viewable by Protection Services staff or recorded.

Clinical cameras will be deployed in MHAS areas and will meet video surveillance requirements as required by current Provincial Mental Health Standards.

Coordinate viewing monitors with the millwork Design to ensure ergonomic viewing and usage in conjunction with other systems. Clinical video images shall not be viewable by the public.

g) In order to ensure patient safety, cameras required for specialized environments (e.g. seclusion rooms) must be approved by the manufacturer for that specific use).

.2 Performance Criteria

Clinical video surveillance will provide observation coverage of all secure and seclusion rooms. The term "observation" means capturing a target with cameras providing images of 20 pixels per foot (horizontal).

Provide client workstations at both the primary and secondary care stations associated with the secure/seclusion rooms. Client workstations for clinical video surveillance will have limited viewing configurations and controls for staff to utilize.

c) Provide colour, high sensitivity cameras with auto-iris lens operation, vandal proof and anti-ligature Design. Cameras will be IP devices minimum HD (1920 x 1080p) resolution, with wide angle lens. Mounting will be appropriate for the environment, unobtrusive, matching colour with hidden cabling.

d) Infrared illuminated cameras are required for patient observation in low or no light (sleeping) environments. Cameras will have no visible lights in the patient rooms.

Viewing monitors will be LED type with a minimum of 17" diagonal viewing surface. Clinical activity monitors will be located out of public view as required to protect privacy. Provide privacy screen covers as required.

System will be IP based and will utilize the structured cabling infrastructure. The clinical video surveillance system will be an isolated network. Clinical video surveillance will not be recorded and will not have any integrations with other systems.

g) The clinical video system will be real time viewing with extremely low to no latency (10msec) or delay.

Provide clinical video surveillance cameras at locations determined in consultation with the Owner, including:

each interview room;

all mental health and addiction services areas, which will have 100% coverage;

seclusion rooms; and

secure rooms.

MHAS non-recorded coverage will be monitored locally at the associated care hub and as required by current Provincial Mental Health Standards.

Interface requirements

Owner Network.

7.8.7 Radio System

Basic Requirements

Provide a complete 2-way, multi-channel Radio System including all required infrastructure and equipment to support the requirements of Protection Services.

The Radio System will extend the existing communication system located at the Integrated Logistics Office.

c) Provide 20 portable 2-way radios with all required equipment to complete a fully working system.

Provide Zetron pre-recorded voice announcement system for automatic dispatch of messages to the Radio System.

Radio System is considered a Facility system.

.2 Performance Criteria

a) The Owner has standardized on a 2-way multichannel Motorola Radio System with Zetron voice message annunciation.

b) The Radio System will work independently of the Integrated Logistics Office system. If the Integrated Logistics Office is not available, the on-Site Radio System will continue to be fully operational.

Provide all licenses required to extend the existing system to the new Facility.

System alarms that generate messages are to be pre-recorded voice messages, not messages automatically generated by a text to speech engine, except for the Fire Alarm System.

The Radio System will not rely on the Owner network for operation.

The Radio System will operate on Facility UPS power.

g) The Radio System tower will require a lightning protection system.

The Radio System tower will be coordinated with the heliport approach requirements.

The Radio System will not utilize the cellular DAS within the Building for signal distribution.

Provide 100% coverage of the Facility Site such that radios will work in all interior and exterior spaces/areas.

k) The Radio System will be capable of sending text messages from the Integrated Logistics Office to individual radios and to groups of radios.

l) The Radio System will automatically broadcast pre-recorded voice messages from the following systems: fixed and wireless duress systems, infant protection system, intrusion, and Fire Alarm System to all radios. The voice message will relay specific location information for the system, device, type, and location of the alarm generated.

Interface Requirements

Owner Network, Fire Alarm, Nurse Call, Fixed and Wireless Duress, Intrusion, Infant Protection.

8 SITE, INFRASTRUCTURE AND LANDSCAPE SUBGROUP SPECIFICATIONS

8.1 Earthwork (Division 31)

8.1.1 General

All Alliance Works will be Designed and Constructed in accordance with the latest version of the BC Building Code.

.2 All Alliance Works will be Designed and Constructed in accordance with the Municipality of North Cowichan's Bylaws.

8.1.2 Site Clearing

Participants will undertake Site clearing in accordance with the following principles:

Selectively clear the Site of trees, shrubs and other vegetation to provide clear sightlines around the Facility and the Site.

b) Remove existing Site improvements and/or structure(s), as required for the Construction.

Participants will undertake Site clearing to the following quality requirements:

a) Clearing, pruning, and tree protection will comply with the Participants' arborist's direction.

Topsoil stockpiling, protection, preparation and placement will comply with the Municipality of North Cowichan's Soil Removal and Deposit Bylaw.

Participants will undertake Site clearing in accordance with the following performance requirements:

Clear and grub out stumps and roots to not less than 200 mm below ground surface.

Selectively clear trees and brush vegetation as required for Construction. Clearing shall be completed during the least risk timing windows for active nesting and breeding.

Prevent damage to existing trees and shrubbery which are determined to be retained. Protection of existing trees and shrubbery will conform to Owner's direction.

d) No burning debris on the Site.

Use of herbicides will be avoided.

8.1.3 Earth moving

The Participants will Design and construct the Facility in accordance with the following, related to earth moving:

Perform earth moving activities including excavation, backfilling, soils compaction, and soils preparation as required for the Construction of the Facility, including landscaping improvements.

.2 The Participants will undertake earth moving in accordance with the following quality requirements:

Grading, excavation, trenching and backfill will comply with all applicable

Standards referenced in the Municipality of North Cowichan's Engineering Standards and Soil Removal and Deposit Bylaw.

Backfill under roadways and sidewalks will conform to applicable MNC Engineering Standards.

Repair roadways, sidewalks, and curbs that are required to be cut and restored during Construction or damaged by Construction to applicable MNC Standards.

Conduct inspection and testing of soil compaction to be carried out by a Designated testing laboratory.

Participants will undertake earth moving in accordance with the Geotechnical Report provided by the Owner (in the Data Room).

8.1.4 Site preparation and grading

Site preparation will include clearing and grubbing, organic overburden removal, fill removal, Site grading, including excavation and subgrade fill, as required to achieve the finished Site grading for the Project, including parking areas, roadways, walkways and landscaped areas.

Existing fills under and outside of the proposed Facility areas are to be removed to acceptable native subgrade approved by the Participants' geotechnical engineer.

.3 Subgrade fill under proposed Facility areas are to be imported granular fill acceptable to the Participants' geotechnical engineer.

.4 Subgrade fill under roads, parking and hardscaping will be approved native or imported granular material as acceptable to the geotechnical engineer and capable of being compacted to the specified compaction requirements.

.5 Prior to importing or exporting materials from the Site the Participants will obtain the necessary permit for soil deposit or removal from the Municipality if required. All fill materials brought on the property are to be from identified and documented sources, be certified free of contaminants with all imported fill monitored for compliance by a qualified geotechnical engineer retained by the Participants.

The Participants will submit proof of satisfactory compaction test results for review and approval prior to installation of subsequent fill layers.

All existing subgrades are to be proof rolled after stripping.

Permanently graded slopes between terraces are to be no steeper than 3 horizontal to 1 vertical.

.9 Slope away from the Building except as required for specific Project requirements.

.10 Design grades to provide adequate surface drainage. Do not drain onto adjacent property or structures. All Site drainage to be drained to the on-Site storm sewer system.

8.1.5 Existing utilities

Verify, establish location, and protect all existing utilities during the course of the Alliance Works. Coordinate with and obtain approval from utilities for rerouting any existing services. Maintain services to all other Buildings and properties operational. Record location of re-routed services.

8.1.6 Embankment and Site Grading

Basic Requirements

All earthworks will be constructed in accordance with the geotechnical report.

The excavation, trenching and backfill will be constructed in accordance with the geotechnical report.

.2 Performance Requirements

All earthworks will be compacted to the densities specified by the Participants' geotechnical engineer.

All utility trenches will be compacted to the densities specified by the Participants' geotechnical engineer.

8.2 Exterior Improvements and Landscape (Division 32)

8.2.1 Basic Requirements

All landscape plans will adhere to the specifications set out in Section 5.13 Exterior Improvements and Landscape, including the Site Design concept, gateway elements, green roof development, public art requirements, universal accessibility, and exterior Site safety.

.2 Provide Design for all exterior spaces in compliance with all provisions of this schedule and Indicative Design requirements.

.3 All landscaping and Site Design will comply with any applicable Municipality of North Cowichan Standards and bylaws, including the Bell McKinnon Local Area Plan.

.4 Workmanship and materials will meet the requirements of the latest edition of the British Columbia Landscape Standard, and /or the Canadian Landscape Standard, whichever is more rigorous.

8.2.2 Landscape Elements – All Areas

Provide landscape architecture for the Site that contributes to the vision for the neighbourhood outlined in the Bell McKinnon Local Area Plan, for a liveable, healthy, connected community.

.2 Design landscape elements and features that are welcoming and inviting, support universal accessibility, and mitigate the risk of undesirable Site activities or self harm.

Select or Design Site furnishings and elements that provide for frequent amenity nodes and seating opportunities. Spaces and furniture should acknowledge the differing levels of physical and mental wellness and mobility. Products should be selected on the basis of physical comfort and accessibility, safety, aesthetics, and materiality. Design of Site furnishings should relate to the overarching campus Design and architectural material palette.

.4 Proposed trees and shrubs should be located to support sightlines and intuitive Site wayfinding, and not obstruct views to main entrances or major Site amenities.

Site Design should maximize areas of softscape and infiltration and minimize areas of hardscape or impermeability.

8.2.3 Performance Criteria

Provide exterior amenity spaces in the Design of the Facility including:

a) Spaces that will be fully accessible to the public with strong connections to the Site and the neighbourhood;

Spaces that provide respite to patients, staff, visitors, and neighbours; and

Spaces that provide a convenient and comfortable environment for Staff breaks and eating outdoors.

.2 Provide universally accessible entrances.

Provide weather protection for portions of the exterior amenity spaces, to support and encourage year round use / access during inclement weather.

.4 Exterior Amenity Spaces will meet the following:

Provide all landscaping for all outdoor amenity areas, including all Site furnishings and supporting appurtenances.

Provide elements of interest and healing character, such as sculptures, public art, labyrinths, raised garden plots, healing gardens, and a variety of active / vibrant and quiet / contemplative seating spaces to create a varied and interesting landscape.

.5 Secure Outdoor Spaces

Provide Secure Outdoor Spaces in the Design of the Facility including:

Spaces will be fully observable space from indoor program areas and/or by video surveillance.

Provide a variety of seating areas from which to choose, including covered areas that provide weather protection without the opportunity for self harm.

Provide fixed furniture that mitigates the potential for self harm or harm to others.

Provide furniture with comfortable, welcoming materials that do not get excessively hot or cold, shed water, and do not have sharp edges or corners.

Provide for social connection that supports small group conversation as well as individual solitude and reflection.

Provide space for programmed physical activity and exercise as well as free use and movement.

vii) Spaces will be slip resistant and accommodate patients with medical equipment or mobility devices such as, wheelchairs, or walkers.

Exercise / Activity zones to be resilient safety surfacing or artificial turf meeting CSA Z614.

ix) Raised planters will be provided to support horticultural therapy programs and visual access to nature and plant material.

The useable landscape space must have a horizontal spatial separation from adjacent patient rooms. Plant material is encouraged to be included in this separation.

.6 Material Design Palette

Landscape elements should consider materiality and composition to stimulate sight, smell, sound, and touch.

Landscape elements should implement a natural palette of materials such as stone, wood, steel, and concrete. Artificial or manufactured products such as composites and plastics should be avoided.

c) Horizontal concrete flatwork should be decoratively finished, to enhance the

architectural Design of the Building. Acceptable finishes include glass seeded concrete, exposed aggregate, swirl finishes, and / or sandblasted.

Stamped concrete finishes are discouraged.

Artificially tinted or coloured concrete is not acceptable.

Artificial plants are not acceptable.

.7 Site Furnishings:

Provide Site furniture that:

Is Designed for a variety of users of the Site;

Is Designed to accommodate wheelchairs users to sit at a table or alongside fixed seating;

iii) 25% of which has backrests and armrests;

Is built of durable material reflecting the Design palette requirements for the Site;

Seating nodes shall be provided at a frequency of 40m apart on pedestrian pathways, to create areas of respite for mobility challenged users;

Recycling, and waste receptacles to be provided at all entrances, amenity spaces, and major seating nodes;

A mixture of fixed and movable elements is encouraged, to provide for diverse users and user experiences. Provision will be required to secure movable Site elements.

Plant Material

Planting palette to emphasize the inclusion of traditional and / or Indigenous plants, local to the Project area and traditionally used for healing.

Deciduous trees to be a minimum size of 100mm caliper, to provide seasonal interest and immediate impact. A minimum soil volume of 18 cubic metres of soil is to be provided for each tree.

c) A variety of groundcovers, grasses and perennials, shrubs, and trees should be used to provide a range of seasonality, resilience, and visual interest.

Local and / or adapted plant material should be used to minimize maintenance requirements. All plant material should be appropriate to the regional hardiness zone and local microclimate.

Plant material selection should take the principles of Crime Prevention Through Environmental Design, in terms of sight lines, and visual porosity.

f) Avoid large areas of sod / turf, in favour of naturalized grasses, wildflowers, and meadows.

Provide street trees and plant material to create functional and resilient ecosystems that reflect and link to the surrounding natural context of the Site.

h) Street trees and trees within hardscape areas to be planted with a minimum of 18 m3 of clear soil volume.

i) Plant selection will prioritize pollinator -friendly species selections.

j) Plant selection must consider the proximity to adjacent agricultural land reserve.

.9 Maintenance

Delineate zones with differing levels or requirements of landscape maintenance.

Prepare a comprehensive maintenance plan and two-year schedule outlining requirements to establish landscape in a healthy and vigorous growing condition.

Maintenance period will be two years in duration, following Substantial Completion of the landscape scope of Alliance Works.

9 APPENDICES

9.1 APPENDIX 2A CLINICAL SPECIFICATIONS AND FUNCTIONAL SPACE REQUIREMENTS

9.1.1 Please see attached.

9.2 APPENDIX 2B WOOD FIRST APPROPRIATE USE MATRIX

Note: Participantsmust meet the requirements of the BC Building Code including the requirement for the primary Building structure to be non-combustible. Use of wood or mass-timber as part of the primary structure for the Facility would require application for approval as an alternative solution and is not appropriate for this Project. The following matrix provides guidance on where to implement wood without jeopardizing the requirements of the BC Building Code.		
Area of Usage	**Appropriateness**	**Justification**
Substructure		
Forming (temporary)	Appropriate	The use of wood in this process is a traditional method of Construction.
Foundations	Inappropriate	The loads applied to the foundations are typically in excess of wood's capabilities and wood is subject to rot, mould, insects such as termites, and moisture retention all of which are exacerbated by proximity to ground.
Below Grade Beams, Walls, Slabs, and Columns (including slabs on grade)	Inappropriate	Not permitted as a prescriptive solution by the BC Building Code. The loads applied to the substructure of the Building are typically in excess of wood's capabilities and wood is subject to rot, mould, insects such as termites, and moisture retention all of which are exacerbated by proximity to ground.
B-2 Occupancy Structures		
Main (Ground) Floor (beams, slabs, etc)	Inappropriate	Not permitted as a prescriptive solution by the BC Building Code. The use of wood or mass-timber structural systems is not permitted based on the intended use, gravity and lateral loading, span length, deflection and vibration requirements, fire protection requirements, and functional adaptability requirements of this Facility.
Columns	Inappropriate	Not permitted as a prescriptive solution by the BC Building Code. The use of wood or mass-timber structural systems is not permitted based on the intended use, loading, and functional adaptability requirements of this Facility.
Upper Level Floors(beams, slabs, etc)	Inappropriate	Not permitted as a prescriptive solution by the BC Building Code.The use of wood or mass-timber structural systems is not permitted based on the intended use, loading, span length, deflection and vibration requirements, fire protection requirements, and functional adaptability requirements of this Facility.

Roof & Penthouse (beams, slabs, etc)	Inappropriate	Not permitted as a prescriptive solution by the BC Building Code. The use of wood or mass-timber structural systems is not permitted based on the intended use, loading, span length, deflection and vibration requirements, fire protection requirements, and functional adaptability requirements of this Facility.
Heliport	Inappropriate	Not permitted as a prescriptive solution by the BC Building Code. The use of wood or mass-timber structural systems is not permitted based on the intended use, loading, span length, deflection and vibration requirements, fire protection requirements, and functional adaptability requirements for the Heliport.
Secondary Structure/Decorative Elements	Potentially Appropriate as an 'Alternative Solution' Approach	Although the base Building structure is required to be of non-combustible Construction, Participants are urged to consider a heavy timber/mass timber Design that could be integrated as a 'secondary' structure or decorative installation for specific feature areas.
Other Occupancy Structures		
Primary & Secondary Structure / Decorative Elements	Potentially Appropriate as an 'Alternative Solution' Approach	For Buildings and structures with occupancy classification other than B-2, where infection control requirements are reduced, Participants are encouraged to consider heavy timber/mass timber framing integration into the structure and decorative elements. Consideration is to be given to infection control, cleaning and maintenance, with use of wood avoided in high-touch locations.
Exterior Cladding		
Roof Finish (Flat Roof)	Inappropriate	There is no known wood product for this application
Walls above Ground level	Inappropriate	Vertical Exterior cladding, details, trims, etc., are not permitted due to weathering of the surfaces and high maintenance costs involved.
Soffits above ground level	Appropriate or Potentially Appropriate as an 'Alternative Solution' Approach	Horizontal and protected Soffits are appropriate. Exterior components such as soffit/trims could be supported with an 'alternative solution' approach' incorporating fire-retardant treated wood (FRTW) or exterior sprinkler protection strategies where warranted.
Exterior Windows	Inappropriate	Ability to clean and water/chemical resistance are paramount in this location.
Curtain Wall	Inappropriate	There is no known wood product for this application

Exterior Doors and Screens	Inappropriate	Wood doors and screens, details, trims, etc., are not permitted due to weathering of the surfaces and high maintenance costs involved.
Roof Accessories (parapet, cant strips, plywood backing)	Appropriate	Wood permitted
Interior Partitions and Doors		
Partition Studding	Inappropriate	Not permitted by the BC Building Code
Interior Doors	Appropriate for offices Inappropriate for ORs and MDRD	Framing, core and facing of door can be wood for locations not requiring greater than a 90 minute fire resistance rating. Wood doors in high metal cart and material transport traffic areas and high humidity areas like the clinical and MDRD areas would be inappropriate.
Vertical Movement		
Stairs (Structural)	Inappropriate	Not permitted by the BC Building Code
Stairs (treads, risers)	Inappropriate	Not permitted by the BC Building Code
Guardrails	Inappropriate	Wood is not suitable due to the anticipated loading and infection control requirements
Handrails	Inappropriate	Wood is not suitable due to the anticipated durability and infection control requirements
Finishes, Fittings and Equipment		
Hardwood Floor	Inappropriate	Wood could be used in certain, non-clinical locations as a floor finish; this would be limited to high-end finished areas, which are not subject to low acoustic or high usage requirements
Ceiling Tiles	Potentially Appropriate as an 'Alternative Solution' Approach	Wood could be used in ceiling tiles for aesthetic requirements in certain, non-clinical areas within the Building provided that they are not more than 25mm thick with a flame spread rating not more than 25, and except for not more than 10% of ceiling area in a fire compartment is permitted to have an FSR of up to 150. This would be limited to high-end finished areas that are not subject to low acoustic or high usage requirements.

Wall Finish	Potentially Appropriate as an 'Alternative Solution' Approach	Wood could be used as a wall finish for aesthetic and acoustic requirements in certain, non-clinical areas within the Building provided that they are not more than 25mm thick with a flame spread rating not more than 150. This would be limited to high end finished areas which are not impaired by acoustic and high usage requirements. Beyond that permitted by the BC Building Code, interior finishes could be supported with an 'alternative solution' approach incorporating other considerations/features such as specific geometry/location of wood, potential fire exposure potential and enhanced fire suppression systems for the area.
Toilet Partitions	Appropriate	The core material for the partitions can be made from wood particles.
Exterior Signs	Appropriate	The base material on which the sign is mounted can be of wood. This does not apply to interior room signage or wayfinding signage.
Loose Equipment (Desks, chairs, etc.)	Appropriate	The core material for the desks, chairs, etc., can be made from particle and complete wood substrate except where CSA Standards require non-porous materials such as in Lab, Pharmacy, MDRD, Food Services, the Sterile Core and the Surgical Suite.
Fixed Equipment (Millwork)	Appropriate	Frames, core material, doors and substrate for millwork can be constructed with wood. This includes aprons/backing, shelves, cabinets and counters not containing plumbing fixtures.
Modular Benches	Inappropriate	To be stainless steel in MDRD and all other locations that require non-porous materials.
Specialized Equipment	Inappropriate	Clinical equipment and associated environment cannot utilize wood as these environments need to be inert.
Blocking within walls	Appropriate	For attachment of handrails, accessories and similar interior finish items mounted on the surface of walls.
Nailing Elements	Appropriate	Wood nailing elements attached directly to or set into a non-combustible backing for the attachment of interior finishes are permitted provided there is no air space of more than 50mm thick
Mechanical		
None Known		
Electrical		
Electrical Panel Backing	Appropriate	Fire-treated wood backing is suitable for use within Electrical Rooms
Site Development		

Landscaping (Architectural, decorative, Site furnishings, etc.)	Appropriate	Wood could be used in Landscaped areas for Art and Architectural features.
Participants		
Site establishment	Appropriate	Where appropriate, the Participants are to endeavour to utilize materials of wood and wood derivative for their Site establishment.

9.3 APPENDIX 2C DESIGN GUIDELINES

9.3.1 PROJECT VISION

An inclusive process to create a compelling, sustainable and innovative future of excellence in health care and Design for the new Cowichan District Hospital and for the residents of the Cowichan Valley.

9.3.2 CDHRP DESIGN PRINCIPLES FOR THE PROJECT

.1 The intent is to adopt the Island Health CDHRP Design principles for the Design and Construction of the new Cowichan District Hospital Replacement Project.

9.3.3 CDHRP Design Principles are as follows:

Patient Family and Community: Design facilities and services that support seamless and positive patient journeys and enhance patient, family and community experience.

Cultural Safety: Recognize and respect differences while striving to address inherent power imbalances.

Cultural Humility: Self reflect to understand personal and systemic biases and develop relationships.

.4 Evidence Informed and Quality Driven: Best current evidence guides decisions and provides accountability. Access to high quality and safe care and services is equitable for all in the Cowichan Valley.

.5 Community of Care: Strengthen services to better support health and wellness through an integrated continuum of care that ensures the right care is provided in the right place to meet the community's changing needs.

.6 Great Place to Work and Learn: Create workspaces that not only foster excellence in service delivery but also creates an environment that supports recruitment and retention of an engaged workforce.

.7 Collaboration: Ensure the hospital Design supports and strengthens the community partnerships that already exist in the Cowichan Valley.

Flexible Design: Design the Facility to be flexible and to have surge capacity to meet (the sometimes unpredictable) future needs of the population and to be able to adapt to new technological solutions as they evolved.

Sustainability: Create efficient patient flow and Design concepts that support operational cost efficiency, environmental health and community wellbeing without compromising the ability of future generations to receive healthcare services, enjoy a healthy environment or live resiliently in the community served.

Innovation: Explore innovative options for care, be curious, ask questions.

9.3.4 ENGAGEMENT PRINCIPLES FOR THE PROJECT

The intent is to ensure that the Design of the Site and Building receives timely, appropriate and consultative review and input from the various stakeholders for the Project.

Include stakeholders in a planned engagement strategy in consultation with IH.

9.3.5 GENDER DESIGN LENS

The intent is to ensure that during the Design of the Project a lens is placed over the Project that assesses any inclusion of systemic inequalities, as well as, how diverse groups of women, men, and gender diverse people may experience the Building and Site Design. The analysis will go beyond sex and gender and include the examination of a range of other identity factors (e.g. Indigeneity, age, education, language, race, ability, class, etc.)

Gender Based Analysis Plus (GBA+):

Gender Based Analysis Plus (GBA+) is an analytical tool that may be used to assess how diverse groups of people may experience policies, programs and initiatives. The following sample questions highlight the assessment:

What Assumptions are you making?

Are you making assumptions as to who your stakeholders/ clients are? Are you assuming what is best for your them?

b) What social factors, norms, or stereotypes are informing your assumptions?

.4 Who could be left Behind?

Are generalizations being made that could lead to various groups or genders falling through the cracks or not being supported?

How is this detrimental to the Project?

Who did you Consult?

Did you consult those who will be directly affected by your Design decisions?

What informed your decision of who to consult?

Were consultations made with those who had been identified as at risk of being left behind?

Was voice given to those who are often mis- or underrepresented?

.6 What Data did you look at?

Is your data disaggregated by various intersections such as sex, gender, age, ethnicity, indigeneity?

b) Does your analysis and presentation of data reflect social factors, norms and roles?

.7 How are you ensuring Equality of outcomes?

Are equity measures being used?

Are those measures taking intersectional factors into consideration?

9.3.6 UNIVERSAL DESIGN

The intent is to ensure that the Design of a development enables all people, including people with disabilities, to have full and unrestricted access to every part of the Facility.

Building and Site Design features which segregate circulation/ areas/ uses for people with disabilities from typical public usage should be discouraged, except where required due to reasons of safety or significant space limitations. For example, ramps on the exterior are discouraged in favour of more gentle grade changes and alternate Design approaches.

9.3.7 EVIDENCE INFORMED DESIGN

The intent is to develop Site and Building architecture to create environments that promote healing and wellness for public, patients and staff through evidence informed Design principles and current research.

.2 Incorporate the latest research into features of the Design such as:

access/views to daylight and sunlight;

access/views to landscaped gardens;

interior lighting and control;

family areas within patient spaces;

e) appropriate interior material choices; and

the most current evidence informed principles and research.

9.3.8 DEVELOPMENT AUTHORITY REQUIREMENTS

The intent is to address the development requirements of the Municipality of North Cowichan.

.2 Municipal Regulations

The Project will address the requirements of the Municipality of North Cowichan Bell McKinnon Local Area Plan (BMLAP) and any other applicable legislation.

The Project will address the development requirements in the Zoning Bylaws.

Variances such as: Building height and on street parking on Hospital Road North and South will be addressed according to the municipal variance process.

9.3.9 GOOD NEIGHBOUR

The intent is to accommodate the development while minimizing the impacts on adjacent land uses and creating positive recreational amenities for the area.

.2 Agricultural Land Reserve

Project Site is part of agricultural land reserve and will respect the adjacent reserve property to the east by maintaining existing tree cover in the buffer zone area and Designing for appropriate uses such as the regional trail system.

Positive Amenity

As one of the first developments in the area the Project will set a standard for Design and quality for future developments in the area.

b) Design and Construction of the new Facility should mitigate the impact of traffic, noise, lighting, and other environmental conditions on adjacent residential areas.

Design the Facility and Site to be a good neighbour to the surrounding community and create a positive recreational amenity for the neighbourhood.

.4 Create Community Opportunities

a) Create the provision of community gardens in landscaped areas that are accessible for use by the community.

Connect regional trail pathways/bikeways through the Site for public access.

c) Create landscaped areas for community use.

Noise Mitigation

Locate Building ventilation systems to minimize noise and exhaust in pedestrian areas, and outdoor spaces. These systems shall be provided with noise attenuation screening if they are located facing and within 200 metres of residential areas.

Noise mitigation strategies will be applied to areas where objectionable noise is being generated such as refuse, recycling, loading, and service areas.

The mechanical and electrical equipment (i.e. generators) shall be provided with noise attenuation.

.6 Rooftop Design

Roof-top mechanical equipment must be concealed either within an upper floor mechanical penthouse or within screened structures on the roof and, consistent in form and detailing with Building.

Roofs that are visible from patient care areas should typically be provided with a decorative material finish.

Refuse, Recycling Areas

The Designs of the enclosure of outdoor refuse/recycling areas and the screening of service areas must be coordinated with and complement the overall Design of the development.

Refuse/recycling areas, in shipping, loading areas, must be screened from view from residential streets.

9.3.10 CULTURAL CONTEXT

The intent is to address reconciliation and rights of the Indigenous communities in the Project area:

a) Decent work and economic growth for Indigenous and the under privileged, reduced inequalities, partnership peace and justice; and a consideration to B.C. Bill C-15 United Nations Declaration on the Rights of Indigenous Peoples Act (UNDRIP).

9.3.11 RESILIENCY AND CLIMATE CHANGE

The intent is to address resiliency requirements identified for the Project. These priorities include:

Climate Adapted

Provide facilities and operations that can fully function in future Projected climate changes. Public Sector organizations are required to manage climate change risk by these organizations: Climate Change Accountability Act, MoH mandate, Clean B.C., Island Health Strategic Framework, Climate Cowichan Valley Regional District.

Build climate resistant and climate adaptable Site and Building for the life cycle of the Project.

Mitigate Project's contribution to climate change.

Improved Resilience

Improve resilience of Facility and reduce risk for surrounding community.

9.3.12 SUSTAINABILITY

The intent is to address sustainability priority requirements identified for the Project. These priorities include:

.2 Environment Value

The Project will value and treat the environment (plants, land, waters) as part of the health care system. This broad definition of the health care system requires a wholistic view of the Site and Building Design.

Energy and GHG Emissions

Mitigation of Project's contribution to climate change. Minimize GHG emissions from embodied carbon in materials and Construction; from ongoing operations; and fugitive emissions (refrigerants and anesthetic gases).

b) Efficient use of resources. Minimize water and energy consumption. Minimize waste and maximize use of renewables.

Minimize life cycle costs (capital, operating, maintenance costs).

.4 Air Quality

Outdoor Air Quality - Minimize harm to community from emissions or improve air quality for surrounding community.

Refer to CVRD Airshed Protection Strategy.

Indoor Air Quality- Maintain quality indoor air by minimizing indoor pollutants and maintaining required humidity levels.

d) Consider impacts from indoor materials and activities ,as well as, outdoor conditions including climate changes such as increased pollen, wildfire smoke and changes in humidity.

.5 Water Flows

Reduce and provide efficiency of water use to minimize water consumption through water use intensity targets.

b) Provide reuse of water on Site through water quality treatment and retention structures.

Enhance stormwater management system through green infrastructure i.e. constructed wetlands, rainwater harvesting, tree wells, ponds, absorbent landscaping and pervious paving.

d) Provide water shortage strategies for drought.

.6 Waste and Toxicity

Design Project to acknowledge Cowichan Valley Regional District Zero Waste Vision for region.

Divert majority of Construction waste from land fill or disposal Sites.

Minimize toxicity of Construction materials.

Zero chemicals of concern in materials, and furniture.

.7 Indoor Environment

Noise mitigation and Design for a quiet health care environment.

Control of lighting, glare control, temperature and privacy.

c) Use of Biophilic principles for interior Design.

Site, Transport and Natural Assets

Design Facility for a Healthy Built Environment (HBE) (HBE-B.C. Centre for Disease Control)

Design Site and Building to withstand intense climate events such as: storm water, surges, floods, windstorms and heavy rain or snowfall to allow continuity of operations.

Conservation of existing natural vegetation, elimination of introduced species and reintroduction of natural species in Design of landscape.

9.3.13 SAFETY AND SECURITY

The intent is to minimize opportunities for crime and to promote a sense of security through the Design of the built environment.

.2 CPTED principles to be used in Design of Site.

.3 Site Design to use principles of defensible space, visibility, no obstructive vegetation and sufficient lighting for nighttime use.

9.3.14 MASTER PLAN DESIGN

Design the Site and Buildings according to the CDHRP Design Guidelines for the Project.

.2 Design the Site to allow for future expansion through renovation, additions and new Construction.

Future development must allow the CDHRP to maintain required services during Construction and to be operationally viable at the end of each phase.

.4 Future development must integrate with Site infrastructure and adjoining neighbourhood context, including Site access points, onsite circulation and landscape spaces.

.5 Future development must provide the ability to, and must allow flexibility for, further expansion and replacement Construction on the CDHRP Site.

.6 Strengthen the connection with adjacent communities by developing complementary uses that are accessible to these communities

9.3.15 SITE DESIGN

The Site utilization and development will address the municipal goals for developing an urban context through density, massing, circulation, and landscape.

Provide focal points and landmarks to help orient Site visitors and create a distinctive image.

.3 Establish "nodes" and "public circulation spines" between Buildings that promote interpersonal interaction, relaxation and facilitate efficient movement.

.4 Respect neighbouring communities by:

Limiting Building height at the perimeter of the Site and corresponding shading.

Providing a landscaped buffer at the edge of the Site.

.5 Supporting appropriate traffic and parking management measures within the Site and in surrounding communities.

.6 Design for all seasons by providing interior and exterior spaces for year-round use and enjoyment.

Maximize opportunities presented by the Site topography, such as multilevel access and views.

Provide a clear pattern of internal circulation throughout the Site through an internal ring road.

.9 Organize arrival sequences to create logical progression and orientation to Buildings and the Site.

Provide clear routes for emergency vehicles with direct connections to major access points

Provide clear way-finding from the Site's front doors by ensuring unobstructed and well-signed access to and from the major access points.

.12 Provide multiple pedestrian routes throughout the Site and segregate visitor, staff, and patient pedestrian traffic as much as possible.

.13 Tie into the municipal regional pathway system.

9.3.16 PARKING DESIGN

The intent is to Design outdoor parking supply to be located at grade and organized so as to:

a) Provide emergency parking adjacent to emergency services.

Allocate parking stalls amongst users according to need for convenience. The hierarchy of needs, with the greatest need first, is:

i) Patients

Physicians

Visitors

Staff

Distribute parking uniformly throughout the Site so as to distribute the traffic "load" on the internal roadway system and adjacent arterial roads.

9.3.17 HELIPORT DESIGN

The intent is to the protect helicopter flight paths across the Site.

9.3.18 WALKING ON SITE

The intent is to provide a pedestrian-friendly environment on Site through a range of complementary actions:

Provide pedestrian routes around Site and to all Buildings.

Locate related functions next to one another.

Integrate indoor and outdoor pedestrian routes.

Make pedestrian routes attractive and secure.

9.3.19 CYCLING ON SITE

The intent is to encourage bike commuting through a range of complementary actions:

Provide secure bike lockups, shower and changing facilities for staff.

Make bike routes attractive and secure, on and off street.

Segregate bike and pedestrian traffic from each other where possible

9.3.20 BUILDING DESIGN

.1 The intent is to ensure that the Building and Site development will enhance the value of the Site as a valuable public real estate asset.

Public Asset

The Building and Site development will recognize the CDHRP as a major centre for employment and provide services and amenities that will support staff and others during their working day and night on Site.

Building and Site development will be sustainable and strive to limit environmental impacts and reduce operational costs.

Internal Zoning

Organize new Construction into functional zones with interrelated functions as horizontally contiguous as possible.

Maintain horizontal service and pedestrian connections between Buildings at each floor level.

c) Create flexible planning zones by placing "soft" components such as offices, adjacent to "hard "components such as Diagnostic Imaging to allow for future expansion of the "hard "component into the "soft" area.

d) Locate major fixed elements such as exit stairs to maximize functional footprint area.

Maintain horizontal service and pedestrian connections between Buildings at each floor level.

f) Incorporate wayfinding so that patients, public, service personnel and staff are able to navigate through the Buildings with a minimum of disruption and confusion.

Vertical Integration

a) Create vertical integration by locating vertical transport systems such as elevators, escalators and stairs in key locations such as main intersections and lobbies.

Provide consistency in floor numbering, way finding and other elemental indicators to create clarity in circulation within Buildings.

Building Image

Ensure Buildings are appropriate to their context and contribute to the overall quality of Design through use of local materials and a Building envelope Designed to withstand future climate change.

Provide Building Design imagery that addresses the local context and is welcoming to all users.

c) Incorporate imagery in consultation with the Indigenous Advisory Council that is appropriate for the health care Site and context.

9.3.21 INTERIOR DESIGN

.1 Integrated Design Concept

Holistic Concept

The intent if that the interior Design concept should be cohesive with the architectural and Site Design principles to create a holistic Design approach. The Design of the Facility should create a cohesive thematic Design solution which integrates the Site, exterior Building mass and facades and the interior environment and wayfinding, through and integrated Design approach.

ii) The Design process and the Design concept should display a cross pollination of ideas.

The intent is for the interior environment to have an aesthetic, functional and experiential relationship with the exterior architecture and landscaping.

iv) The intent is to connect the architecture with the interiors through Design elements that blur the lines through the use of entry access points to the Building that utilize natural light, transparency and views for both visual and physical connections to adjacent landscape and the community which enhances intuitive wayfinding.

These same Design elements and approach described in item iv) above also pertains to all of the major circulation paths, intersections and nodes within the Building.

The interior Design should seamlessly incorporate mechanical and electrical devices so that the Design elements are not interrupted nor the Design intent lessened with undesired device locations and conflicts.

The interior Design intent is to create a functional, aesthetic using materials that are durable, timeless, sustainable, easily maintained and appropriate for use in a healthcare Facility.

Key Principles

The Participants shall provide developed interior Design key principles that align, supplement and enhance the CHDRP Design Principles for the Project noted in Appendix 2C Design Guidelines.

ii) The intent of the interior Design principles is to provide a more detailed level approach to the concept and to ensure that they are considered in the holistic Design approach for the Project.

9Refer to B651 for accessibility requirements for signage.

Intuitive wayfinding

i) The intent for the interior Design is to augment and enhance the wayfinding and signage strategy in the form of physical and spatial expression. One that is memorable, humanizing and experiential.

Interior Design shall create feature elements through form, light colour, materials and pattern that support wayfinding and create an intuitive and experiential movement through the space.

Indigenous Integration

The interior Design concept in conjunction with the architecture shall be developed with the incorporation of Indigenous culture and the

Participants will consult the Indigenous Advisory Council through the process.

The interior Design concept and key principles will demonstrate respect for First Nations, Metis and Indigenous cultural values represented by indigenous groups of Vancouver Island British Columbia and the Cowichan Valley throughout the development and Design of the Facility.

.2 Patient Journey

a) All aspects of the interior Design should enhance the patient journey. Participants should develop Design concepts that are conducive and distinct to the patient experience and are considerate to the emotional mapping of the Building.

.3 Humanistic and Scaled

Interior Design elements should be scaled appropriately to suit the type of space and experience; large scale elements for publics spaces and smaller scaled elements for individual spaces.

Intimate detailing at a human scale should be incorporated at all scales to be welcoming, provide connection and relieve stress.

Humanistic elements should be incorporated through pattern, Biophilia, art and graphics to enhance and nurture a sense of belonging within the Building and the surrounding community.

Design elements within public spaces, vertical and horizontal circulation, and departmental entries should be distinctive, memorable and scaled to aid in intuitive wayfinding.

Participants should create beautiful forms related to the Building architecture and landscaping at a human scale for the interior spaces.

.4 Access to Natural Light and Nature

Participant to incorporate natural daylight into as many interior spaces as possible and consider clerestory glazing, borrowed light and view corridors to enhance the patient journey.

The interior Design intent for access of views to nature should be considered both in the literal form through glazing as well as the abstract windows of nature through graphics and art.

c) Interior Design themes and elements should consider blurring the lines with those spaces that have or are adjacent to direct access to nature such as courtyards and rooftop decks.

Participants to consider nature through art and graphics that provides context and a connection to the community promoting a sense of place

Intent for use of Biophilia concepts as part of the interior Design themes such as representation of nature through materials, colour, patterning and geometries.

.5 Department Differentiation

Participants to develop Design features (ceilings, walls, floors and portals) and colour palettes to differentiate adjacent departments to aid in wayfinding and to provide distinct environments suited to the patient experience and emotional mapping.

.6 Colour Palette

Participants to develop a meaningful colour strategy through evidence based colour theory that support and aligns with the architecture and grounds the interior Design concepts.

The intent for the colour palette should augment the wayfinding strategy and the patient, visitor and staff experiences.

Application of colour should support and promote the function of the space.

Placement of colour should not interfere with the assessment of a patient's pallor and skin tones.

Intention for placement of colour should not disorient or agitate patients, visitors and staff.

f) Participants should develop a robust strategy that creates a common and timeless field palette and limits material colour choices for ease of maintenance and replacement.

.7 Safety

The intent for the interior Design concept and implementation is to provide a high level of safety for all patient, visitors and staff.

Create interior Design experiences that are comfortable and inviting and promote an atmosphere of healing and hope.

Use interior elements to enhance spaces for respite, relaxation and meditation to promote wellbeing for patients, visitors and staff.

Participants to carefully consider and collaborate with the CDHRP representatives for the specification and application of materials and finishes in conjunction with the maintenance and IPAC requirements.

e) Participants to balance the function and aesthetic Design with the lens of promoting health and wellbeing to the Building inhabitants.

.8 Retract, Retain and Empower Staff

The intent is to provide exceptionally interdisciplinary Design strategies through planning and development of interior environments.

b) Create distinct community identities and unique program spaces within the overall Project that reflect and promote a sense of belonging for staff.

The intent for creating transparency and interdisciplinary Design is to foster interaction between clinicians and patients.

d) Promote through Design – collaboration, connection and flexibility through bright open spaces and impromptu meetings.

Participants to provide innovative ideas and freshness to all aspects of the interior Design.

9.3.22 ART

The intent is to create an aesthetic interior and exterior Design using art to enhance the welcoming, enjoyment, healing and wellness experiences for the Project.

Refer to Appendix 2J Art for a description of goals and requirements.

9.3.23 COMMISSIONING AND ASSET MANAGEMENT

The intent for the end goals of the commissioning process are for a fully commissioned Building that meets all clinical needs with all systems and functions working in harmony.

.2 The intent is for a Facility asset that endures for its Designed lifecycle and meets asset management criteria with optimized whole life cost.

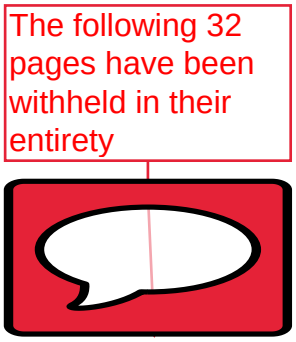
Refer to Appendix 2H Testing and Commissioning Framework and Appendix 2P Asset Management for a description of goals and requirements.

9.4 APPENDIX 2D IMIT RESPONSIBILITY MATRIX

9.4.1 Please see attached.

9.5 APPENDIX 2E IMIT TECHNICAL SPECIFICATIONS

9.5.1 Please see attached.



9.6 APPENDIX 2F UBC FACULTY OF MEDICINE DESIGN GUIDELINES AND FUNCTIONAL REQUIREMENTS

9.6.1 Please see attached.

Attachment 2F-1 Design Guidelines and Functional Requirements for Learning Spaces: Small Seminar Rooms

Attachment 2F-2 Design Guidelines and Functional Requirements for Learning Spaces: Enhanced Clinical Skills Suite

Attachment 2F-3 Design Guidelines and Functional Requirements for Learning Spaces: On-Call Suites

9.7 APPENDIX 2G VIHA AV SPECIFICATIONS

9.7.1 Please see attached.

9.8 APPENDIX 2H COMMISSIONING

9.8.1 Application

This section provides a framework for all commissioning requirements that are common to the Alliance Works Sections of Schedule 2 and as a supplement to each Section is to be read accordingly.

9.8.2 Definitions

.1 For the purposes of this Appendix only, the following definitions shall apply:

"Abnormal Operating Conditions" means non-standard operating condition such as post disaster scenario, hospital emergency code condition, power surge and outage and other utility failure, major equipment failure and recovery, network outage, and security threat incidents.

"Assembly" means the Components and Equipment that together encompass the "Assembly".

"Clinical Commissioning" means the activities undertaken to determine the readiness of staff, procedures, and other non-infrastructure elements of the clinical program prior to commencement of patient care.

"Commissioning Manual" means the collective documents that are contained within the manual as stated in item 4.9.2 of CAN/CSA-Z8001 that documents the commissioning process and contains all relevant information required to commission the Facility.

e) "Commissioning Plan" means the project specific document that describes all elements of the commissioning process in accordance with item 4.2.3 of CAN/CSA 8001, and in accordance with the Alliance Management Plan Requirements in Section S7.10 of Schedule 7.

"Commissioning Team" means the Participants' multidisciplinary team responsible for the development, coordination, and application of the commissioning process.

g) "Components" means the elements of an item of Equipment, Assembly, or System.

"Equipment" means the individual item or device that encompasses Components.

"Functional Performance Testing" means a full range of tests under actual load, conducted to verify that specific Systems, subsystems, Assemblies, Components, and interfaces between Systems conform to required sequence of operation or other given criteria.

j) "Owner's Project Requirements" means the dynamic documents that contain the necessary explanation of the ideas, concepts, and criteria that are considered to be essential to the Owner, including performance expectations, all as described in Schedule 2 and Schedule 7 and thereby act as a basis for the preparation of the Commissioning Manual and Commissioning Plan.

k) "Systems" means the Components, Equipment and Assembly that together encompass the "System".

9.8.3 Abbreviations

For the purposes of this Appendix only, the following abbreviations shall apply:

a) CC – Commissioning Coordinator

CDH – Cowichan District Hospital

CP – Commissioning Provider

CX – Commissioning

CXAu – Commissioning Authority

FMO – Facility Maintenance and Operations

KRA – Key Result Area

O&M – Operations and Maintenance

i) OOS – Owners' Operating Staff

OPR – Owners' Project Requirements

PCX – Post Substantial Completion Commissioning

l) SC – Substantial Completion

TAB – Testing and Balancing

9.8.4 Introduction

The success of a healthcare project can be severely impacted where the quality of installation is poor and/or the commissioning process is proven to have failed. These two elements of the Project are key enablers to ensure success and are therefore of significance to the Owner and are an integral part of the Key Result Area (KRA) requirements.

The aspirations for the end goals of the commissioning process are a fully commissioned Building that meets the Owner's Project Requirements (OPR) including all clinical needs with all Systems and functions working in harmony.

As an integral element of the Commissioning Manual, Participants will establish a robust, complete and in-depth Commissioning Plan that covers all aspects of a phased approach to both technical and operational testing and commissioning, including integrated commissioning and Abnormal Operating Condition testing, that ultimately assures the Owner, to the greatest extent possible, that the Project delivery objectives are proven, that they meet the Design requirements and Standards applied, and that clinical business requirements and functional performance outcomes have been fully met to establish completion acceptance criteria and Substantial Completion (SC) project status.

.4 Participants shall utilise the CSA Z8001 Standard as a foundational commissioning framework to develop the Commissioning Manual that addresses the necessary organization, identification of phased activities and appropriate allocation of time and resources for each commissioning phase as necessary to deliver a superior commissioning process that will ultimately fully support an effective start up, handover and activation phase.

9.8.5 Commissioning Objectives

The objectives of the commissioning process are to:

Support quality management objectives by monitoring and checking the installation against the associated required installation and operational output Standards and functionality requirements;

verify that applicable Equipment, Systems, Components, and Assemblies have been designed, installed, and are operating satisfactorily and in harmony and are

within the parameters specified by the Owner; and

transfer use of the Facility from the Participants to the Owner in such a way that the Owner receives a quality facility that is safe and secure and promotes the efficient and effective delivery of healthcare services and is supportive of positive patient outcomes.

9.8.6 Commissioning Phases

.1 The following phases are envisaged as part of the overall commissioning program:

Design Phase - Establishment of commissioning elements that are influenced by design including Standards, set points, sequence of operations, Owner and user-based criteria, etc.

b) Construction Phase I – To move the completed installation (that includes all activities related to off-site testing and on-site testing and commissioning following installation) from the "static completion" state to the "dynamic" operational state (required for Functional Performance Testing) so as to transfer a fully functional, complete, and correctly operating installation from the Participants to the Owner.

Construction Phase II – Commissioning, through Functional Performance Testing, with the inclusion of the Owner's operating staff, to verify that Systems, including integrated/interfaced Systems, behave in accordance with the sequence of operations established for each System or Systems and meet performance expectations under normal and abnormal modes of operation.

Substantial Completion – Confirmation that applicable Components, Equipment, Assemblies, and Systems:

Have received adequate operational checkout and performance verification by means of testing and commissioning of the completed installation;

have acceptable Operation and Maintenance (O&M) and handover documentation that is confirmed as being complete and correct in all respects; and

iii) are understood by the Owner's operating personnel and that they are adequately trained on all required Components, Equipment, Assemblies, and Systems provided as part of the Project.

e) Post Substantial Completion Commissioning (PCX) – Post SC commissioning activities that are agreed to be deferred beyond SC by Participants and/or are subject to seasonal variations.

Clinical Commissioning Phase – Support to the Owner's Clinical Commissioning process that incorporates user-based training including additional Functional Performance Testing of core clinical Systems that support emergency code preparedness.

g) Substantial Completion – Confirmed completion of all commissioning activity and submission of the complete Commissioning Manual in all respects.

9.8.7 Commissioning Organization Framework

The Owner is very focussed on successful commissioning and is ensuring adequate time and resources are applied to the whole process. To that end the Owner will appoint a third-party organization to be the "Commissioning Authority" (CXAu).

.2 Commissioning work will be performed by Participants under the guidance, supervision, and direction of the CXAu. The CXAu will lead the Commissioning Team in the development of the Commissioning process, Commissioning Manual and the Commissioning Plan. The CXAu will provide senior leadership and review, endorse, oversee, and verify all aspects of commissioning planning and associated commissioning activities.

Participants will engage a third-party organization as the "Commissioning Provider" (CP). The CP will be an independent organization and not be part of any of the Participants' organizations. The CP will be responsible for the full development and completion of the Commissioning Manual and Commissioning Plan including the planning, coordinating, and carrying out the commissioning process. The CP will be vetted and approved by the Owner and CXAu.

.4 The Non-Owner Participants will provide a "Commissioning Coordinator" (CC). The CC will lead the Non-Owner Participants' team, including subcontractors and vendors, in support of the CP in the planning, coordination and completion of commissioning activities and processes including the management of subcontractors and vendors undertaking commissioning activities. The CC may be part of the Non-Owner Participants' organizations and must be experienced in commissioning healthcare facilities. The CC will be vetted and approved by the Owner and CXAu.

Participants staff, including subcontractor and vendor representatives, that lead and/or undertake commissioning activity, will have demonstrable commissioning experience related to hospital-specific projects and be suitably qualified for the role and activity being undertaken.

.6 Participants will assign key Design, Construction, and other key representatives, including Owners Operating Staff (OOS), to the Commissioning Team.

.7 Together, these form the Commissioning Team.

9.8.8 Scope of Work

Guided by the CXAu and supported by the Commissioning Team, the CP will develop a full and comprehensive Commissioning Manual in compliance with Z8001, item 4.9.2 as part of the handover process.

.2 As part of the Commissioning Manual, the CP will develop a full and comprehensive Commissioning Plan in compliance with Z8001, item 4.2.3 and other adopted commissioning Standards, for all aspects of Testing, Adjusting and Balancing (TAB), Commissioning (CX) and Post Substantial Completion Commissioning (PCX) activities for the Project and will submit the Commissioning Plan within 120 days after the Commencement Date.

The Commissioning Plan is to align with all commissioning requirements for a healthcare facility, in order to fully complete the Alliance Works and in accordance with, and satisfaction of, all applicable Laws including, without limitation, those relating to occupational health and safety and any and all obligations, responsibilities and duties as defined and required by Schedule 2 or as set out in any Site Plan, agreement or approval.

9.8.9 Commissioning Responsibilities

Responsibilities of the Commissioning Authority (CXAu)

a) Provides senior leadership and overall guidance to the CP, CC and Commissioning Team, including subcontractors and vendors.

Provides overall guidance and oversight in the development and implementation of

the Commissioning Manual and Commissioning Plan.

Represents the Owner on all aspects of commissioning activities.

Attends meetings, tests, inspections, commissioning events as necessary.

Verifies performance criteria and acceptance condition requirements.

Oversees the commissioning process and validates inspections, tests and commissioning activity and outcomes to satisfactory completion, and may elect to witness commissioning activities.

g) Undertakes a review of the commissioning team's background and experience to confirm suitability and competency.

h) Other responsibilities as detailed and agreed in the Commissioning Manual and Commissioning Plan.

.2 Responsibilities of the Commissioning Provider (CP)

Provide expert guidance, leadership, and support to the Commissioning Team, including subcontractors and vendors.

Develop and maintain the Commissioning Manual and Commissioning Plan including commissioning schedule.

c) Review the shop drawings for commissioning related issues and report any such issues to the relevant Participants, CC and CXAu as necessary.

Monitor and inspect the installation for quality on a regular basis throughout the Construction stages, issue reports identifying any issues which may have an impact on the commissioning process, and work with the ALT, AMT, and WPT to expeditiously resolve any problems that may arise due to Site conditions.

Prior to tests, supply and issue Functional Performance Testing procedures for all Equipment and Systems to be commissioned.

f) Arrange with the Commissioning Team for on-site commissioning meetings on an as-required basis, to be attended by the Participants, applicable subcontractors, the Owner, OOS, the CXAu, CC, and others as necessary; chair the meetings and prepare and distribute meeting minutes to all attendees.

g) Ensure that general, mechanical, and electrical contractor leads attend regularly scheduled CX meetings.

Undertake activities that support Quality Assurance processes with selective audits and spot checks, including witnessing and validating tests, identifying deficiencies, and issuing progress reports.

Review completed commissioning check sheets and pre-functional documentation, witness completion of Functional Performance Testing.

j) The CP will take direction from the CXAu as necessary.

k) Preparation of all LEED documentation.

l) Other responsibilities as detailed and agreed as part of the development of the Commissioning Manual and Commissioning Plan.

Responsibilities Specific to Non-Owner Participants & Commissioning Coordinator (CC)

a) Non-Owner Participants shall identify a Commissioning Coordinator (CC) who shall be responsible for leading and directing the efforts of the Non-Owner Participants' test organization and Commissioning Team representatives. This individual shall not have project management, Site management, or any other responsibilities

during the commissioning period.

The CC and representatives leading commissioning activities will have demonstrable commissioning experience relating to hospital-specific projects and be suitably qualified for the role.

The CC will coordinate commissioning scheduling with the Commissioning Team, CXAu, CC and Owner.

The CC shall be responsible for all aspects of the verification test and acceptance arrangements, including:

Managing the program schedule of tests and commissioning activities and updating as required.

ii) Coordinating access to test locations.

Arranging for suitably qualified and experienced personnel as necessary to support the test and commissioning activities, including from subcontractors and functional areas and areas not under Non-Owner Participants' authority.

iv) Coordinating test effort with other functional area Construction and test activity.

Coordinating and providing invite and associated information in advance to all necessary attendees for all scheduled activity.

Ensuring all required infrastructure Systems are ready, available and without issue to undertake the test and commissioning activity.

Providing overall monitoring and reporting of test outcomes including program schedule adherence.

viii) Ensuring the required calibrated test instruments and other Equipment and materials necessary for performing the tests are available to perform the tests.

As Non-Owner Participant's testing expands to the field, the Commissioning Coordinator and other Non-Owner Participants support personnel shall ensure that they are available on site to perform the single point contact functions with full authority to make and implement test decisions on behalf of the Non-Owner Participant to prevent unnecessary program delays.

The Non-Owner Participants shall provide suitably qualified and sufficient resources to support the CC during high volume testing and commissioning activity as necessary.

The Non-Owner Participants and the CC will take direction from the CP as necessary.

g) Non-Owner Participants to ensure that the proposed CP has demonstrable corporate and individual commissioning experience relating to hospital-specific projects and be suitably qualified for the role. References will be provided to the CXAu as required for approval prior to engagement.

9.8.10 Commissioning Manual

Participants will develop a full and inclusive Commissioning Manual.

.2 The Commissioning Manual will be prepared using a structured approach and include complete documentation for each aspect of the commissioning process, from the pre-Design phase to the occupancy and operations phase.

The Commissioning Manual will be developed in a structured format and shall be provided in both hard copy and 'true' PDF using a non-proprietary software folder structure with a searchable, digitally created PDF hierarchal database. Full details of the development of the Commissioning Manual requirements will be developed as part of the Records Management plan.

.4 The Commissioning Manual will address and confirm:

The Owner's Project Requirements,

The basis of Design, including sequence of operation,

Static verification, start-up, and Functional Performance Testing check sheets and reports,

The commissioning reports,

User and operator training reports,

Commissioning Team representatives contract details,

Occupancy and operations evaluation reports,

All relevant Project reports and correspondence; and

i) Any other relevant element as agreed and defined by the Participants.

9.8.11 Commissioning Plan

As part of the development of the Commissioning Manual, the Participants will develop a full and inclusive Commissioning Plan and submit to the CXAu within 120 days after the Commencement Date.

The Commissioning Plan will be prepared using a structured approach and identify the manner in which the commissioning and completion of the Alliance Works will be staged, how the Alliance Works will be handed over to the Owner, and a defects response schedule prepared, and defects closed out.

The Commissioning Plan will address and confirm:

a) Commissioning objectives aligned with Z8001 and other Commissioning references.

Commissioning team roles, responsibilities and clear lines of authority including responsibilities matrix.

c) Commissioning process, commissioning procedures, and workflow roadmap.

Commissioning process where failure occurs and where Design characteristics and/or requirements are unachievable or flawed.

List of invitees for each type of test/commissioning activity.

Commissioning means, methods, test sheets, test reports, forms and techniques for review by the CP and approved by the CXAu.

g) Commissioning Standards, acceptance conditions and tolerances with reference to relevant Standards applying to health care facility infrastructure and Systems (e.g., CSA Z8000, Z32, C282, Z3217.1, Z317.2, Z7396.1, and the Z317 series of engineering and physical plant standards).

h) Technical and operational phases/stages of commissioning including the likes of, but not limited to, off-site and on-site standalone mock-ups, Factory Acceptance Testing (FAT), intra-site testing, LEED related testing and verification, native testing, integration/interface testing, sequence of operation and hospital emergency code testing, static verification; start-up, integrated Functional Performance Testing (including post-occupancy, seasonal, and deferred testing), Abnormal Operating Condition scenario testing, coordinated and controlled black start testing (where deemed appropriate), monitoring-based commissioning and clinical commissioning, etc.

Confirmation of the commissioning platform and associated protocols for the communications of commissioning documentation and information.

j) A full commissioning schedule for all TAB, CX and PCX activities highlighting critical paths.

k) IMIT systems commissioning and verification.

System integration/interface commissioning and scenario-based verification, including varying Abnormal Operating Condition scenarios.

m) The list of the health-care-specific elements that will be included in the commissioning process including the schedule and coordination of Clinical Commissioning.

Functional Performance Testing procedures for all Systems, subsystems and Equipment.

o) Commissioning method statements highlighting potential risks and mitigation measures as well as health and safety related elements.

p) The support provided during the Defect Correction Period to include:

Post-commissioning optimization;

Seasonal provisions; and

iii) Clinical service commencement and other building load provisions.

q) Post commissioning maintenance activities, recording and reporting.

r) Training and Handover documentation.

s) Commissioning reporting.

t) Final Acceptance.

.4 The Participants shall configure the Commissioning Plan so it will support a planned transition of responsibilities of the Facility to the OOS and Owner without duress.

.5 The Commissioning Plan shall include an outline of post-occupancy commissioning activities for System performance evaluation and optimization under various load conditions including seasonally responsive devices, in a variety of modes and under simulated Abnormal Operating Condition on a periodic basis.

9.8.12 Commissioning Activities

Testing, Adjusting and Balancing (TAB) and Performance Verification

Perform TAB & CX of all Equipment and Systems to establish performance verification and that acceptance conditions have been met.

Demonstrate to the CXAu and other attendees, as necessary, that the quality of installation relating to the Building infrastructure and envelope, including special

areas related to pressurization, noise abatement, etc. meet or exceed Design requirements for the likes of roofing, floor drainage, penetrations, pipework, acoustics, pressurization units and other special areas and that they are substantially operational.

Demonstrate to the CXAu and other attendees including Owner staff, that all Systems, including the mechanical, electrical, IMIT and security Systems are substantially operational and operating to the prescribed technical standards, operational expectations and identified performance standards by testing, adjusting, balancing, and commissioning the Systems. Demonstration to the CXAu will include confirmation that the installation meets or exceeds the required spare capacity/redundancy provisions.

Ensure any Construction or installation errors are identified and remedied prior to the start of CX functional testing.

Make all TAB & CX reports available to the CXAu. The reports will identify and confirm System alignment with additional capacity requirements, as necessary.

Utilize a quality assurance system throughout the TAB & CX process to ensure that TAB & CX has been performed to all Equipment and Systems requiring TAB & CX. Demonstrate the quality assurance system to the CXAu prior to beginning TAB & CX.

g) Perform follow-up TAB & CX services as necessary during each season over the first year of the Facility's operation starting from Substantial Completion to facilitate balancing and System optimization.

h) CP to complete records of all TAB and CX data and submit reports to the CXAu for record purposes and retention by the Owner. Submittal process specifics to be developed in collaboration with the Owner as part of the Records Management Plan. All records to be included as part of the handover package.

The Standards applied to the process will follow that approved as part of the commissioning procedures including the likes of:

i) CSA Z8000 Canadian Health Care Facilities

CSA Z8001 – Commissioning of Health Care Facilities

iii) CSA Z320 Building Commissioning Standard

CSA Z316.5 Fume Hood and Associated Exhaust Systems.

v) CSA Z317.1 Special Requirements for Plumbing Installations in Health Care Facilities.

CSA Z317.2 Special Requirements for Heating, Ventilation and Air Conditioning (HVAC) Systems in Health Care Facilities.

CSA Z317.5 Illumination in Healthcare Design

CSA Z317.13 Infection Control during Construction, Renovation, and Maintenance of Health Care Facilities.

CSA Z318.0 – Commissioning of Health Care Facilities.

CSA Z318.1 – Commissioning of HVAC Systems in Health Care Facilities.

CSA Z318.2 – Commissioning of Control Systems in Health Care Facilities.

CSA Z318.3 – Commissioning of Plumbing Systems in Health Care

Facilities.

CSA Z318.4 – Commissioning of Fire Protection Systems in Health Care Facilities.

xiv) CSA Z318.5 – Commissioning of Electrical Equipment and Systems in Health Care Facilities.

xv) CSA Z318.6 – Commissioning of Medical Gas Systems in Health Care Facilities.

xvi) CSA Z32 Electrical Safety and Essential Electrical Systems in Health Care Facilities.

xvii) CSA C282 Emergency Electrical Power Supply for Buildings

xviii) ASHRAE Guideline 1.1- – HVAC & R Technical Requirements for the Commissioning process.

xix) ASHRAE Guideline 0- – The Commissioning Process.

xx) CAN/ULC-S537 – Standard for Verification of fire alarm systems

xxi) CAN/ULC-S1001 - Integrated Systems Testing of Fire Protection and Life Safety Systems

.2 Submittals

Shop Drawings/Product Data Sheets: Submit to the CXAu, at the same time as submittal to the Participants and CP, one copy of each shop drawing or product data sheet associated with Equipment or Systems to be commissioned.

List of Commissioning Instruments: Submit a list of commissioning instruments and for each instrument, indicate the purpose of the instrument and include its calibration certificate which will be no older than 12 months.

c) Start-Up and Test Report Commissioning Check Sheets: Submit Equipment and System manufacturer's start-up and test report commissioning check sheets for review a minimum of one month prior to Equipment and System start-up procedures.

Certify Readiness for Functional Performance Testing: After start-up and successful pre-Functional Performance Testing and submittal of completed forms, submit, for each System or subsystem, confirmation that pre-Functional Performance Testing has been successfully completed and the System or subsystem is ready for Functional Performance Testing and the commissioning process to commence.

Sequence of operation as finalized after commissioning is verified and complete including updates/changes made following commissioning activity and operational verification.

TAB and CX completed reports, checklists, test procedures employed, completed product information and performance verification report forms, approved and accepted including attendees and sign off sheets.

g) Final Commissioning Report to include:

Executive summary of the process and the results of the commissioning program, including observations, conclusions, and any outstanding items.

History of any System deficiencies identified and how they were resolved, including any outstanding issues or seasonal testing scheduled for a later date.

An evaluation of the systems performance test results including completed start-up forms, commissioning check sheets, functional test forms and field inspection reports. Reports to clearly identify Commissioning Team representatives undertaking the commissioning activity as well as all attendees present including acceptance verification and associated commentary.

Confirmation from CP and verified by the CXAu indicating that individual Systems meet the Design intent, basis of Design, OPR, and the PAA.

Software version including confirmation of updates and upgrades undertaken prior to Substantial Completion including provision of restoration backups and source keys as necessary.

Summary of the O&M documentation.

vii) Summary of the training process, the modules and training provided and to whom.

Additional commissioning documentation as deemed appropriate by the CXAu and/or CP.

IMIT and FM Management System Demonstration and Acceptance

Prior to acceptance, the IMIT and FM Management Systems will undergo a series of performance tests and demonstrations to verify setup, operation and sequence of operations, and compliance including associated integrations / interfaces. These tests will occur after support infrastructure and System installation is complete, Equipment has been started up, and System and Equipment tests have been completed.

b) For clarity, responsibilities relating to testing and commissioning activities specific to IMIT and FM Management Systems are defined, and the associated Commissioning Plan elements shall be developed in accordance with the relevant items contained within Schedule 2.

c) Provide the tests required as a necessary part of the installation, start-up, and debugging process and include demonstration to Owner staff including IMIT, OOS and other end users as necessary.

The demonstration process will follow and align to the approved Commissioning procedures. Demonstrations should verify to OOS/users/support staff that the Systems behave in accordance with the sequence of operations. Approved checklists and forms will be completed for all Systems as part of the demonstration.

In consultation with the CXAu, the Participants will create energy optimization measures and analytical rules to verify the sequence of operations as specified for each Facility System for use during commissioning and on-going Facility operations.

Approved checklists and forms will be completed for all Systems as part of the demonstration and verification process.

9.8.13 Post Substantial Completion Activities

Post Substantial Completion Commissioning (PCX)

The PCX process begins at Substantial Completion and extends for a period of 24 months (the Defect Correction Period) and includes seasonal related performance

testing and include any deferred Functional Performance Testing necessary to complete the commissioning check sheets for the Components, Equipment, Assemblies and Systems provided as part of the Alliance Works.

Seasonal verification Functional Performance Testing includes any testing which has been delayed until the weather conditions are closer to the System's design conditions. During the Defect Correction Period, seasonal testing shall be completed as part of Project completion. Tests will be executed, documented and deficiencies corrected, with OOS including FMO staff witnessing. Any final adjustments to the O&M manuals and as-builts due to the testing will be made.

Deferred Functional Performance Testing includes checks or tests not completed during the scheduled functional testing period due to the Building structure, required occupancy condition or other deficiency. Execution of deferred test sheets and functional testing may be delayed upon approval of the CXAu. These tests will be conducted in the same manner as the seasonal tests and executed as soon as conditions permit.

Clinical Commissioning

Participants will provide support to Clinical Commissioning activities undertaken by the Owner to determine the readiness of staff, procedures, and other non infrastructure elements of the clinical program prior to commencement of patient care. This may include the likes of end user training/refresher training of installed Equipment including sequence of operation and Abnormal Operating Condition scenarios including emergency code activation.

Post Substantial Completion Optimization

Optimization is a method of consistently determining the efficiency of a building after it has been built and occupied for a period. It is centred on the needs of the occupants in terms of health, safety, and protection, as well as accessibility, efficiency, comfort, aesthetic quality, and satisfaction.

Identify short and long-term operational issues in the Building and outline possible solutions and correct deficiencies.

Seek out fine tuning opportunities that improve Building energy and utilization performance.

.4 Continuous Commissioning

An additional outcome of the Post Substantial Completion Optimization is to ensure the control System and analytics platform are set to make frequent measurements of all inputs to continuously analyze and verify the Building's performance (including energy and equipment efficiency), automate fault detection, and identify areas of performance improvement and either make automated system changes or send an alert to the FMO through the CMMS.

9.9 APPENDIX 2I EQUIPMENT AND FURNITURE

9.9.1 A further detailed summary for planning and procurement of equipment located in Schedule 7.

9.9.2 Please see attached.

Attachment 2I-1 – Equipment and Furniture List

.2 Attachment 2I-2 – MEQ Specifications

.3 Attachment 2I-3 – Laundry Equipment List

The following 110 pages have been withheld in their entirety

9.10 APPENDIX 2J ART

9.10.1 Overview And Focus

Art is an integral component of the CDHRP. The integration of art into the Project will serve to emphasize the cultural identity and regional identity of the Project. The First Nations, Metis and Indigenous community will have a strong voice in interpreting and implementing the integration of art into the Project. An important focus for art integration will be a strong message on cultural safety, without bias from colonialization history and systemic racism.

.2 Art is a way of expressing cultural life stories, telling who we are, where we come from and where we want to go. It can link past, present and future. Art that illustrates: cultural identity, geographic location, local natural surroundings and community will be a key Project Design element, to encourage community unity, health and healing.

.3 All types of artistic expressions are to be enabled in the Project from performance art such as singing and dancing to visual two dimensional art. Dedicated surface areas and spaces, as well as, multi-use spaces are to be provided for installations and performances in the interior and exterior environment.

9.10.2 Project Definition of Art

Art for the purpose of the Project is defined as the expression or application of human creative skill and imagination in a visual, auditory or performance form such as: painting, sculpture, weaving, dance, music, theatre or storytelling. Its creative expression results from the artist's technical skill, talent and imagination and is to be appreciated primarily for beauty, sacred expression, cultural meaning, conceptual ideas and/or emotional power.

9.10.3 Arts Advisory Group

An Arts Advisory Group (AAG) will be created and arranged by the Owner to serve the needs of the CDHR Project. The group will consist of an Arts Advisory Group Leader, as well as selected group members.

Arts Advisory Group Leader and Group Members

An Arts Advisory Group Leader will be arranged by the Owner and the Indigenous Advisory Council in collaboration. The Leader will chair and direct an Arts Advisory Group. The Arts Advisory Group Leader and the Owner will select jointly the group members. Group membership will be selected from:

First Nations, Metis and Indigenous representatives;

Alliance Team;

Members of the surrounding community; and

Representatives of the artistic communities.

.3 Arts Advisory Group Duties

The Arts Advisory Group will act, organize, coordinate, select, and advise on the following:

Creation and championing the vision for Facility art program and collection;

Ensure cultural safety and representation with the pieces selected and reviewed;

Recognition and reconciliation of historic and current exploitation of Indigenous art, artists and community;

Engagement and meaningful involvement with the surrounding artistic community;

Coordination and alignment with the overall CDHR Project values and themes;

Selection and process of selection for the pieces and events;

Location and placement of art pieces into the CDHR Project;

Coordination of artistic events within the Facility;

Building the collection for the life time of the Facility;

x) Support for Storytelling and other performance events of community cultural importance;

Control and direct the $1.5M seed fund to start collection and fund artists; and

xii) Work closely with Alliance Project team and the Cowichan hospital Site management.

The Arts Advisory Group will establish and implement:

Governance rules;

Selection process and terms for group members;

Cultural training for group members;

Allocation of all Arts Advisory Group resources;

v) Reporting to appropriate community partners;

Requirements for coordination and reporting with Cowichan District Hospital Site administration;

Fundraising;

viii) Promotion for the group's activities;

Terms and conditions of ownership role and caretaker roles;

x) Criteria for selection of ongoing refurbishment and repairs;

Review and acceptance of donated art; and

xii) Development of post occupancy structure, process and support for continuation of art program.

9.10.4 Art Selection Process

The selection of the art will be organized and controlled by the Arts Advisory Group.

.2 The selection of art will embrace Indigenous artists, local artists and artists within the province to draw upon and emphasize the local community in the Cowichan Valley. All art selected will be in keeping with cultural safety and awareness criteria that have been established by the AAG.

.3 The selected art will add value and cultural significance to the collection as it grows over the years.

.4 The selected art will conform to IPAC requirements.

9.10.5 Art Integration and Placement

There are four categories for art integration and placement within the CDHR Project:

Art integral to the Building

Integral Art means artistic elements that are inherent to the structure, products and materials that are used to construct the Building. Integral Art examples could include: feature architectural walls, patterns or graphic images inscribed in Building materials such as concrete or brick; patterns or graphic imagery in sheet flooring or ceramic tile floor; and architectural ceiling treatment and lighting patterns, as well as , surface applied Interior Design thematic concepts and wayfinding graphics or elements.

Art that is attached to the Building and Site

Art that is attached to the Building or Site means artistic elements that are physically connected to structure, walls, ceilings, floors or exterior ground plane. Art that is attached to the Building could include wall, floor and/or ceiling mounted pieces that are permanently fixed in place. Freestanding sculptural pieces, both interior and exterior, would be included in this category;

All locations for art will require support with the necessary structural infrastructure and appropriate lighting, power, and data circuit rough-in to enhance the display; and

A clear wall space free of electrical and mechanical devices and with appropriate wall backing (1200mmx 1200mm) is required for wall art locations. Pad mounts are required for sculptural pieces both interior and exterior.

Art that can be rotated and relocated

These art pieces include art that is placed on a temporary basis and can be removed and relocated; and

These pieces may be located on the wall, floor or ceiling, or may be located in display cabinets throughout the Building. This may include the opportunity for art to be displayed in the inpatient bedrooms as long as art is framed and enclosed behind glass. It may be possible to use monitors to display art in patient rooms rather than placing a real art piece in order to conform to IPAC requirements.

Art for specific therapeutic benefits

It is acknowledged through Evidence Informed studies, that art supports healing by reducing stress and anxiety levels and has a positive contribution to make in health care environments in support of care. For example, artwork inspired by nature, has been studied to show that it creates a calming environment to reduce physiological stress, to create connections with the physical environment and to contribute to an increased sense of well-being.

There are specific areas within the Project that require special attention to safety and security, as well as consideration to create a homelike atmosphere, such as Psychiatric Inpatient Unit, and Paediatric areas. Consultation and collaboration with Clinical Users as well as IPAC is required to assess appropriate art for inclusion in these areas.

9.10.6 Potential Locations for Art

Opportunities to showcase art can occur throughout the Building and Site. Major and minor art works can be located in external public and internal public and private spaces.

.2 Opportunities that exist in the clinical reception and waiting areas can be used for orientation and for visual distraction. Each floor and department can also feature a different character and style that is reflective of that particular area.

Opportunities within the inpatient unit are at the Workstation-Care Team stations and within the Quiet Rooms and possibly within the patient rooms. This can provide a character and style within each inpatient unit and the option of rotating art within the patient rooms provides the patient with choice and control over their environment. These pieces will provide a positive visual distraction within the rooms that reinforce the sense of home and belonging.

.4 Incorporating art within the staff areas and contemplation areas provides a positive visual distraction for staff and helps with both relaxing and recharging. Twinning art and fitness for staff and visitors creates a double bonus: art installations along identified walking loops and paths both inside and outside the hospital for staff and visitors in need of a mental and/or fitness break.

.5 Suggested locations include:

Exterior locations

Entry Plaza Garden;

Cafeteria Garden;

Psychiatric Courtyards;

Gathering/Sacred Space Courtyard; and

v) Off Site neighbouring locations.

Interior locations – public

i) Main Entry Lobby;

Patient Registration;

Gathering/Sacred Space;

iv) Cafeteria;

Meeting/Conference Rooms;

vi) Reception/Waiting Areas;

Elevator Cores;

Main Circulation Stairs; and

Public Corridors.

c) Interior locations – semi private/private

Inpatient Rooms;

Workstation-Care Team stations;

iii) Short Stay Bays;

Staff Lounges;

Quiet Rooms; and

Staff Offices.

9.10.7 Art for Wayfinding

In addition to providing places of reflection and beauty, art also can provide a visual roadmap for the user experience by creating a series of icons and /or landmarks for visitors, patients and families, complementing institutional wayfinding signs.

.2 A consistent strategy for siting locations for memorable art at key access points or circulation nodes such as, elevator lobbies, main stairs, and for major destinations within the Building and throughout the Facility should be developed as part of a comprehensive wayfinding and Interior Design solution.

9.11 APPENDIX 2K FOOD SERVICES SPECIFICATIONS

9.11.1 SCOPE OF WORK

.1 Includes detailed Design, manufacturer, supply, installation, inspection and testing of all equipment referenced in Attachment 2K-1 Food Service Equipment List.

.2 Codes and Compliance

Conform to all laws, bylaws, rules, regulations and requirements of all authorities having jurisdiction.

All electrical equipment must conform to the Canadian Hydro Electrical Code, the Electrical Inspection Department Bulletins, the Technical Safety B.C. requirements and the Canadian Standards Association. All equipment must have a C.S.A. approval label.

c) Gas equipment shall conform to the Canadian Gas Association, the Gas Utilization Code of the Department of Energy and Resources Management and Canadian Standard Association.

Any plumbing or drainage systems shall conform to the Plumbing Code except as modified by regulations and bylaws of authorities having jurisdiction.

e) Steam equipment shall conform to interprovincial codes covering such equipment as well as the rules, regulations and by-laws of authorities having jurisdiction.

Each piece of equipment shall be accompanied by a label or certificate of approval.

g) All mechanical refrigeration system shall be supplied with safety relief valves, shut-off valves for each piece of equipment, refrigerant leak detectors and all other items as required by local regulations.

h) All welded pressure vessels shall be constructed to ASME Code. The vessels shall bear the stamp and certificates framed under glass and hung adjacent to the vessel.

Equipment Design and fabrication must conform with the National Sanitation Foundation and Provincial as well as Local Municipal Health Department Regulations.

.3 Utilize energy star food service equipment where available.

.4 Installation

Caulk and seal equipment to walls, base pads, curbs, and adjacent equipment where required.

Leave installed work neat, cleaned and polished, well fitted into position, level, and in proper operating condition.

c) Promptly remove all rubbish and debris from the Building and Site as the work proceeds and on completion.

Activate, test and adjust all equipment and apparatus installed under this Contract. Refinish and repair any painted and finished surfaces damaged during erection and installation. Hand over the completed installation in first class condition and working order.

Ensure electrical equipment is accompanied by label or certification of approval by Canadian Standards Association, Hydro Electrical Power Commission or Local Authority.

Ensure steam pressure equipment is accompanied by a "Certificate of Boiler" to

satisfy Federal and Provincial requirements.

g) Finished work must be perfectly true and plumb with no warping, buckling or open seams. All edges, hidden or exposed must be ground smooth and rounded. Rivet heads, weld marks, or other imperfections are not acceptable.

Cutting and repairs for the proper installation of services.

i) Obtain permits or special inspections.

Identify equipment with metal plates or labels permanently secured which include, where applicable:

Manufacturer's name or recognized trademark

Complete model identification

Model, serial number and CSA U.L.C. and NSF identifications

Electrical characteristics

Direction of drive

Controls

Circuits, lines, etc.

Specific operating instructions

Identify equipment with temporary labels showing location and Item number per Specifications.

l) After installation has been completed and all items checked and adjusted where necessary for satisfactory operation, arrange for inspection of equipment.

m) Co-ordinate the removal, storage, relocation and installation of all foodservice equipment as required according to the Project schedule.

9.11.2 GENERAL REQUIREMENTS

.1 Electrical work:

a) In liquid tight flexible conduit and concealed within Building walls and/or ceilings wherever possible.

From the Building source or distribution point of power, through disconnect switches or starters to the terminals, connection box, circuit breaker panel or plug receptacles located on the equipment as per applicable codes.

c) Inter-wiring of the kitchen ventilation and fire suppression system components including but not necessarily limited to the following; exhaust ventilator(s) (hood), gas valve(s), gas valve resets, surface fire suppression detector(s) in each hood, fire suppression Building alarm fire and trouble interlocks as required, exhaust fans, makeup air units, cooking equipment shut down devices, and interlocks to Building Management Controls.

All electrical control wiring required for the mechanical refrigeration systems including but not limited to inter-connections from remote condensing units, compressors or compressor parallel pack as specified, to the walk-in refrigerators and freezers.

Electrical wiring for the walk-in refrigerator and freezer including power supply to interior lights, light switches, door heaters, temperature alarms, evaporator coils, drain line heaters, electric defrost and solenoid valves.

Electrical inter-wiring of all walk-in refrigerator and freezer temperature alarms to Building annunciator system, Building security system and/or central refrigeration monitoring system as required.

Electrical wiring for exhaust ventilator, control panel, exhaust and make-up air fans.

Electrical inter-wiring between exhaust and make-up air fans, exhaust ventilator control panel, magnetic contractors and shunt trips etc. so as to shut down power to electric cooking equipment in the event of a fire condition in conjunction with the fire suppression system.

i) Emergency power supply to food service equipment as identified in Appendix 2P Food Service Equipment List, required to maintain food services during a power outage.

j) Electrical inter-wiring of electric gas solenoid valve (if used). Supply and install the reset relay or shunt trip to shut down gas and electricity to the cooking equipment in the event of activation of the surface fire suppression system.

k) Inter-wiring of the fire suppression system to the maintenance annunciator panel or Building security system as required including Building fire and trouble annunciation.

l) Electrical wiring and inter-wiring of multiple food service equipment components such as but not limited to waste pulpers or hydra extractors, hose reels etc.

m) Supply and installation of all electrical receptacles located in floors, ceilings or walls.

Supply and installation of all electrical receptacles, junction boxes or sub-panels in millwork service counters.

o) Supply and installation of low water cut-off devices for any equipment in which immersion type electric heating elements are utilized.

p) Supply and installation of all motors integral with equipment complete with starters, internal thermal overload protection and disconnect switches.

q) Supply and installation of all internal wiring on custom fabricated items in a concealed and well supported manner and terminated inside circuit breaker panels or junction boxes ready for final connection by the electrical trades. All equipment shall be inspected by the local hydro authority and carry CSA and ULC approval.

r) Tag each multiple electrical wire or cable used in any custom fabricated piece of equipment to indicate the item serviced. When circuit breaker panels are used, identify each circuit.

Supply and installation of cords and plugs on equipment as required and match the plug with the respective receptacle.

.2 Mechanical work:

Concealed within Building walls and/or ceilings wherever possible.

Supply, installation, rough-in, and connection of all domestic hot and cold water, drains, vents, gas supply lines, steam supply and condensate return lines as per code from Building supply to the point of connection required for the complete operation of equipment.

Supply and installation of shut off valves, back flow preventers, line strainers, shock absorbers, pressure, temperature and pressure gauges and control valves or devices.

Supply and interconnection of hot and/or cold-water lines to multiple components of food service equipment including but not limited to: dishwashers and booster heaters, waste handling and dish tabling, hose reels etc.

Supply and installation of drain lines, traps, vent piping, clean outs and grease traps, sediment interceptors, drains for floor pans, connected drains for equipment, floor drains with funnels for open drains on equipment, floor drains with funnels and drain lines for evaporator coils.

Supply and installation of all floor drains for general drainage purpose, maintenance and cleaning, throughout the facilities.

g) Supply and installation of all hand sinks, slop sinks, janitorial sinks, water bottle filler, grease traps and general sanitizing stations.

h) Supply and installation of all base Building water heating equipment capable of supplying the volume, pressure and temperature of hot water required to properly operate all food and equipment.

i) Installation of mechanical or automatic electrically controlled solenoid gas shut off valve(s) to shut down fuel to gas cooking equipment in conjunction with the fire suppression system in the event of a fire condition.

j) Supply and installation of steam supply and condensate return lines from Building boiler to the connection point on equipment complete with, but not limited to shut-off valves, line strainers, steam traps, pressure regulating valves or devices, back flow preventers, temperature and pressure gauges and any other necessary equipment or devices to form a complete operating system.

k) Supply and installation of gas lines with manifolds to each piece of gas fired foodservice equipment complete with shut off valves (where applicable).

l) Installation of mechanical or automatic solenoid gas valve(s), in conjunction with the fire suppression system.

Supply and installation of gas main pressure regulating valve(s) to ensure adequate volume and pressure of gas for food service equipment (where applicable).

Testing of all gas connections to appliances as required by local authority having jurisdiction.

o) Connection of all equipment Designated as "Owner Supplied".

p) Disconnection and later reconnection of any equipment Designated as "Existing Equipment To Be Relocated".

q) Roughing-in and capping off of mechanical services required for any equipment Designated as "Future".

r) Use chrome plated piping wherever exposed.

Provision and installation of all faucets complete with aerators and replaceable seats, ready for connection by appropriate contractor.

t) Supply and installation of chrome plated overflow assemblies, drain fittings and traps with tail pieces for all sink type assemblies.

u) Supply and installation of chrome plated blowdown piping from items with relief or safety valves, extend piping to nearest hub or floor drain approximately 4" (100mm) above drain.

v) Gas pressure regulating valves for gas fired cooking equipment must be factory pre-mounted on the appliance by the manufacturer.

w) Gas fired cooking equipment included as part of a cooking equipment battery must be set in place and leveled. Ensure that all pieces fit properly and complete/test final gas connections between individual pieces of gas fired cooking equipment as required by local authorities having jurisdiction.

x) Gas fired cooking equipment with casters must be installed with positioning docks constructed of flame retardant thermo plastic resin capable of withstanding 500psi of direct force, Posi-set or equal, to ensure proper positioning of equipment.

y) Inter-piping of all hot food well drains to one common 1 1/2" (38mm) chrome manifold and extend to 4" (100mm) above floor drain or funnel floor drain. The drain(s) shall be trapped as required by local codes complete with clean out. Provide a separate extended shut off valve for each well.

.3 HVAC/mechanical work:

a) Supply, installation and connection of all exhaust ductwork from exhaust fan(s) to foodservice equipment, exhaust ventilator(s) hood(s) or dishwashing and cart washing equipment per the current edition of the NFPA-96 as recognized by Building codes, and per the requirements of the B.C. Gas Utilization Code.

Supply and installation of all exhaust s.s. duct work leading to exhaust ventilator(s) hood(s) take-off collars and connect to collars. Use watertight duct work and weld all joints as per the current edition of NFPA Code - 96.

c) Supply and installation of make-up air system including fan, s.s. duct work, distribution grills and/or connection to make-up air plenum on exhaust ventilator(s) (hoods), if specified.

.4 Additional work:

Supply and installation of floors, floor leveling materials and floor finishes throughout the foodservice areas as well as those required for, but not limited to, prefabricated insulated walk-in type refrigerated and frozen room assemblies.

Provision of all floor depressions required for foodservice equipment.

Provision of concrete curbs and bases around and under foodservice equipment.

Provision of sleepers with vibration isolation for refrigeration systems.

Provision of all Building floor slab depressions, slab insulation, flexcell expansion joints and slab ventilation system(s) for prefabricated, insulated walk-in refrigerated or frozen room assemblies where specified. Finished floor inside walk-in room must be at the same level as area outside the room. No ramping will be acceptable.

f) Supply and installation of extruded Styrofoam - Foamular 1000 or equal insulation in floor depressions or under concrete slab for all prefabricated, insulated walk-in type refrigerated and frozen room assemblies.

g) Supply and installation of in-fill concrete topping inside prefabricated, insulated walk-in refrigerated and frozen room assemblies which have depressed prefabricated insulated floor panels or extruded Styrofoam so as to make floor level with outside floors (allowing for floor finish thickness).

Supply and installation of all floor tile or other specified flooring finishes inside prefabricated, insulated walk in type refrigerated and frozen room assemblies including coving up inside and outside of prefab walls.

i) Supply and setting of sleeves in floors, walls and ceiling (as well as any related core drilling) for electrical, mechanical refrigeration, plumbing, gas and beverage lines etc.

Supply and installation of structural supports or sleepers for roof top condensing units, condensers or evaporative condensers, exhaust and make-up air units etc as specified.

k) Supply and installation of structural support beams to anchor hanging rods for roof panels of all prefabricated, insulated walk-in refrigerated and frozen room assemblies and exhaust hoods.

.5 Work related to the prefabricated insulated walk-in refrigerated and frozen storage room assemblies and mechanical refrigeration systems shall be and include:

a) Supply, installation and erection of all prefabricated insulated panels required to insulate Building structural columns that occur within walk-in type refrigerated and frozen room assemblies.

Supply and installation of internal and external bumpers as required.

c) Supply and installation of low temperature fluorescent lights with quick start.

Supply and installation of stainless steel flashings as required to conceal openings in prefabricated insulated walk-in type panels.

e) Supply and installation of stainless steel corner guards at all interior and exterior outside corners and insulated panels around Building structural columns.

Supply and installation of viewing windows (heated for freezers) on sliding and hinged doors.

g) Supply and installation of removable enclosure panels from top of insulated walk in type refrigerated and frozen storage room assemblies to finished ceiling. Color and finish to match color and finish of room assemblies.

Supply and installation of insulated liquid refrigerant supply, hot gas and suction return lines required to interconnect mechanical refrigeration system components including piping runs from indoor and/or outdoor air cooled condensing units, compressors, compressor parallel packs to evaporator coils within prefabricated, insulated walk-in type refrigerated and frozen room assembly required in order to form a complete operating mechanical refrigeration system.

.6 Work related to the exhaust ventilators and fire suppression system shall be and include

Supply, set-into-place and suspension of all exhaust ventilators, integral make-up air plenums supplied and installed with exhaust ventilator(s) or (hoods).

b) Supply, and set-into-place exhaust ventilator(s) control panels complete with control relays as required for interlock to the Building central alarm panel.

Supply and installation of fire suppression systems complete with piping, bottles, fusible links as specified, release mechanisms and all other necessary accessories and components to form a complete operational and NFPA and ULC approved system.

Supply and installation of remote fire pull stations for the exhaust ventilator/fire suppression system.

The supply and installation of remote fire suppression system shall be in accordance with all requirements and regulations of Underwriters' Laboratories of Canada, "N.F.P.A. Code 96", B.C. Building Code and other local municipal authority having jurisdiction.

Supply and installation of removable s.s. panels from the top of exhaust hoods to the underside of the finished ceiling.

9.11.3 MATERIALS

.1 Materials for fixed surfaces shall be impervious to moisture, corrosion resistant, smooth and able to withstand regular cleaning and sanitizing.

.2 Stainless steel, denoted by the abbreviation "s.s." in this specification shall be ASTM-A167-81A, (18-8 Analysis) type 304 cold rolled and annealed, No. 4 finish one side, 180 grit finish free of buckles, pits, warps and imperfections. Ensure that direction of grain matches throughout units.

.3 Stainless steel tubing shall be 304, seamless and welded, No. 4 finish, 38mm sq. for all legs and bracing.

.4 Nuts, bolts, screws, washers and other fastenings shall be type 304 stainless steel.

.5 Galvanized steel sheet, generally referred to as Satincoat; zinc coated, 380 gms/sq. m. Where such material is used as an exposed surface, it shall be finished with one (1) coat of primer and two (2) coats of air-dry enamel, silver gray unless otherwise specified.

.6 Structural steel shall be new material, conforming to recognized standards, grade 300W, cleaned and primed.

.7 Gauges of material refer to U.S. Standard Gauges.

Gauges are as follows:

1.0 mm - 20 ga.

1.2 mm - 18 ga.

1.6 mm - 16 ga.

2.0 mm - 14 ga.

v) 3.0 mm - 12 ga.

.8 Sound deadening, 3mm thick rigid waterproof insulation, Component Hardware M75-1366 applied under working surfaces.

.9 Electrical Components

Electrical parts shall be compatible with materials specified for use on this Project. Receptacles shall be waterproof and have stainless steel cover plates and screws. Cords and caps shall be approved type, matching the receptacles for which they are intended.

Receptacles, junction boxes and breaker panels shall be easily accessible without dismantling equipment.

c) Terminate wiring within equipment at load centre or junction boxes with wires identified by Item No. and load.

Properly rate and ground all receptacles.

Supply load centres with bolt on "qwik-gard" type circuit breakers properly rated and identified. Include two (2) 20 amp. spare breakers. Face of panel shall be easily accessible behind stainless steel hinged door of a compartment which must be insulated from local heat.

Equip 3-phase motors with magnetic starters with thermal overload protection on each of the three phases.

g) Equip single-phase motors of fractional horsepower rating and those ranging up to and including .746 Kw with manual starters with overload protection. Motors rated

over .746 Kw must have magnetic starter with overload protection.

h) Terminate wiring for motors in fused disconnect within 900mm of equipment to be controlled, between 1500mm and 1800mm above floor unless otherwise specified.

i) Control circuits to be 120 V maximum.

Provide all lighting fixtures for Designated equipment with colour corrected lamps and controls or switches wired to an easily accessible common junction box for power connection.

Fit all portable and mobile electrical equipment with cord and plug suited for the electrical characteristics and outlets specified for the equipment. Include grounding conductor in the cord.

.10 Plumbing Components

Plumbing components shall be compatible with materials specified for use on this Project.

All control valves and faucets, pipe fittings, waste and tail pieces etc., must be brass chrome plated, bright finish, new, best quality and comply with applicable codes.

Valve handles must be of non-conductive materials.

d) Faucets, Fisher or Encore, Inlet Size 12mm IPS.

Deck Mount, Encore Model K57-4006, Inlet Centres 102mm, spout 152mm

Deck Mount, Fisher Model 3500, Inlet centres 102mm, Spout 152mm.

Deck Mount, Encore Model K61-8008 or Encore Model K61-8012, Inlet centres 203mm, or Gooseneck

Deck Mount, Fisher Model 3300, Inlet centres 203mm, Spout 203mm, 279mm, or Gooseneck.

v) Splash Mount, Encore K54-8008 or Encore Model K54-8012, Inlet centres 203mm, Spout 203mm or 279mm.

Splash Mount, Fisher Model 3200, Inlet centres 203 mm, Spout 203mm or 279mm.

Provide wrist action handle on all faucets unless specified otherwise, Encore Model K50-001.

Pre-Rinse units, Pot Sink, 19mm IPS Encore Model KN53-5026-12, complete with K50Y-500 swivel arm support, K55-7012 add-on faucet and all attachments including wall brackets for splash mount units.

Wastes, 38mm or 51mm IPS.

Centre type, with removable basket strainers and tailpiece, Specialty Hardware model P1.

Rotary type stainless steel, Specialty Hardware DSS8000 with strainer.

Corner type, with stainless steel overflow, removable strainer and tailpiece.

.11 Miscellaneous

Casters to be black neoprene non-marking rubber tired, 60 shore hardness,

doughnut shaped, ball bearing, equipped with brakes as noted, sized to suit specific usage, zinc finished. Plate type shall be securely bolted to frame. Shank casters shall be threaded type c/w bushing. Bushing shall be welded and upright. Bolts, nuts and lock washers shall be stainless steel. All casters supplied shall be made by the same manufacturer. Casters shall be supplied on each unit to suit its particular application so that it runs freely and handles easily, minimum of 4" diameter and 200 lbs. capacity per caster.

Bumpers shall be Colson #6915 for wrap around type set into stainless steel channel and #6927 for corner type c/w a 1.6mm s.s. exterior casing. Secure bumpers on equipment at identical height and seal any exposed gap.

c) Garbage containers shall be Rubbermaid #2620 complete with lid and #2623 Dolly.

Towel rack shall be K-Venience type.

e) Cutting boards shall be white thermoplastic polyethylene, with a hardness of 65-70 durometer and all surfaces polished, as supplied by Rubbermaid Products Inc., Johnson Plastics or approved equal.

All sealants shall be one-part silicone type, tackfree in less than one hour with complete cure achieved to 6mm depth in less than 24 hours. Sealant must not significantly alter its properties when set.

g) Sealant to remain flexible and resistant to damage from all normal environments of a commercial kitchen. It must not support the growth of bacteria, mould or fungi or discolor.

Sealant to be clear or as required to suit colour of surrounding materials.

.12 Hardware

Handles that are an integral part of doors shall be Component Hardware Model P44-1010 full grip stainless steel pulls.

b) Handles that are an integral part of drawers shall be Component Hardware Model P44-1010 full grip stainless steel pulls.

c) Catches shall be Component Hardware Model M32-2401, concealed magnetic catch with a 30 lb. pull.

Door track hardware shall be Component Hardware Model B57-0144.

Door guides shall be Component Hardware Model B62-1093 or equal.

Door stops shall be Component Hardware Model B60-1086 or equal.

g) Front door by-passing door locks shall be Component Hardware Model B58-5513 for non-heated cabinets and B58-5511 for heated cabinets.

h) Back door by-passing door locks shall be Component Hardware Model B58-5523 for non-heated cabinets and B58-5521 for heated cabinets.

i) Swing door hinge for refrigerator doors shall be Component Hardware Model R42-2840.

j) Refrigerator door hardware: Self closing, heavy duty stainless steel offset pivot hinges with magnetic gaskets and 430 stainless steel door frame and tamper proof cylinder locks and two (2) keys per lock.

k) Stainless steel drawer slides: Component Hardware Model S52 series for standard and refrigerated units.

l) Drawer locks: Component Hardware Model P30 series, stainless steel face (drawers shall not be keyed alike). Supply two (2) keys per lock and hand over to the Owner.

Provide locks on all doors and drawers. Key each section of the foodservices areas with a different series of locks, two (2) keys per lock.

n) Casters shall be cadmium plated, steel disc cushion non-marking rubber tired wheels with adjustable cup and cone ball bearings. Caster swivel with two rows of ball bearings running in hardened raceways. Capacity per caster, minimum 100 kg. All stem casters with expanding type fittings of size to suit tube. Plate casters mounted with stainless steel bolts and lock washers for easy replacement. All casters on mobile equipment lubricated for efficient use in varied temperatures of kitchen, walk-in refrigerators and freezers. Casters on mobile equipment equipped with cart-washable casters with grease nipples to assure adequate watertight lubrication.

o) Pilaster strips, stainless steel 20mm wide with 13mm adjustment.

p) Clips for shelves shall be die formed stainless steel.

.13 Welding

All welding shall conform to the requirements of CSA specifications and be performed by fabricators who are approved by the Canadian Welding Bureau and CSA specifications. Exposed welds shall be filed or ground smooth and flush and polished to match surfaces. All exposed welds shall be continuous.

.14 Electric seamless welding shall utilize low carbon filler rod, coated with non-carbonaceous flux, with sufficient chromium and nickel so that the deposited metal and the original metal have the same composition.

Welds shall be free from pits, cracks, discolouration and other imperfections.

Welded joints shall be butt fitted, properly jigged, continuous, ground smooth and polished for both exposed conditions as well as unexposed welds on underside of equipment.

c) Where soldering is desirable, it shall be made with tin-lead solder. In no case shall soldering be relied upon for the stability of the seam or joint. Soldering shall serve only as a filler to prevent leakage and shall not be considered as a replacement for welding or brazing.

d) Butt joints made by spot welding or riveting straps under seams and filling with solder, puddled welds and exposed screws are not acceptable.

.15 Fabrication

Before fabrication commences, check all dimensions and conditions at the Building Site, including means of access into and through the Building to the area where equipment is to be set in place, for all conditions affecting the delivery and installation of the equipment.

Fix and assemble work in the shop wherever possible. Execute the work in accordance with reviewed and accepted details and shop drawings. Where complete or final shop fabrication is not possible, make a trial assembly in the shop prior to delivery.

Workmanship shall be of the best grade modern shop and field practice for the manufacturers who specialize in this work.

Fabricate and erect work square, plumb, straight and accurately fitted. Provide adequate reinforcing and anchorage in all places.

Insulate where necessary to prevent electrolysis.

All drillings to be reamed and exposed edges left clean and smooth.

g) All straight lengths shall be one piece throughout, with all seams, including field joints, continuously welded. Radiused corners must be welded and polished to match original finish.

h) Conceal joints and connections wherever possible. Intermediate joints between supports are not acceptable.

i) Machine dressed work and finished work shall be free from drag, feathers or roughness of any kind. Remove machine marks by sanding

j) Pop rivets shall not be used unless clearly noted on shop drawings.

The methods of Construction, reinforcement and anchorage, as well as details of finish, fitting and jointing, and other data indicated on shop drawings shall be accurately followed.

The gauge of metal and methods of Construction shall in all cases be adequate for the various conditions to be met, with the requirements of the Design details and Specifications considered as minimum. Finished equipment shall be rigid when assembled and installed.

m) All fastenings and fittings shall be stainless steel, type 302 or 304 unless otherwise specified. All bolts and screws shall have truss heads or flat heads which are properly countersunk, at exterior and interior surfaces which are normally visible. Concealed fastenings shall be used throughout, unless otherwise approved by the Participants.

n) Sheet material for counter tops, tables, shelves and similar forms shall be straight lengths, in one continuous sheet if not over 3 metres long.

o) Make provisions in the equipment for proper installation of services and connections. Cut and patch only when necessary. The completed installation shall be properly finished without rough edges or exposed openings.

p) Allow for expansion and contraction of materials.

q) Obtain samples and confirm sizes of trays, racks, pans and china to determine the exact requirements for openings in equipment.

.16 S.S. worktables and counters

2.0mm stainless steel continuous sheets all welded.

Reinforcing shall be a minimum 3.0mm Satin Coat subtop arranged so that forms are concealed from normal view. Secure reinforcing to tops with stud welding and appropriate silicone.

c) Table or counters up to 1800mm in length shall have a minimum of 4 legs.

Tables with sinks shall have a marine edge unless otherwise specified.

Worktable and counters with sink, work tops to slope towards sinks at a slope of 20mm per metre. For dish tables 8mm per metre toward dishwashing machine. Front edge level over full length.

Edges shall be as shown and specified in the standard detail, SD 401.

g) Kickplates, where specified, shall be of 1.6mm stainless steel and secured to equipment, easily removable.

.17 Tops

Stainless steel tops as specified under "Worktables and Counters".

Wood tops as manufactured by Michigan Maple Ltd. style "G" - 48mm thick, cured and selected edge grain laminations c/w steel bolt reinforcements. Sand and finish both sides.

Polyethylene tops (high density types) as distributed by Johnson Plastics. Material is white (all surfaces polished with a hardness of 65 Ä 70 durometer), 19mm thick, no-toxic, with no odour or taste transfer and stain resistant. Top to be reversible and properly supported on stainless steel framework.

d) Marble tops shall be continuous 25mm thick, white veined and fairly uniform in colour. Provide "A" type graded marble free of cracks and fractures. Support top on stainless steel framework with lateral cross members and a rubber cushioned underpad at the supports. Polish and seal to protect against acids and oils.

.18 Backsplash

a) 2.0mm stainless steel fully welded.

Integral section of table or counter top turned up on a 19mm radius to the height specified, then boxed or splayed.

Enclose, fill and weld all exposed ends and back. Exposed backs at upturns and splashbacks shall be faced with 1.2mm stainless steel back panel to bottom of splashback. Such panels shall be removable as required for access to mechanical and electrical parts. Seal backs to wall with clear silicone.

.19 Legs and bracing

1.6mm stainless steel wall, 41mm O.D. tubular.

Provide framework for table tops to maintain a height of 900mm above finished floor.

Leg spacing maximum 1600mm apart, 760mm front to back.

Bullet feet, Component Hardware Model A10-0851. When table has service connections, dowel and secure to floor using Component Hardware Model A10-0854. Secure to one set of feet only when bridging a structural expansion joint.

Braces shall be continuously welded to legs, polished with minimum reduction in volume.

f) Cross brace legs in pairs and longitudinal brace at front, centre or back to suit requirements. All set at 250mm above floor.

g) Legs shall be continuously welded to s.s. saddles of inverted U shape 100mm wide x 20mm deep x 2.75mm. Flanges angled back or rounded at each end.

.20 Over cupboards

1.2mm stainless steel all welded

Top sloped at 30 deg., end gables boxed and bottom shelf fixed.

c) Intermediate and adjustable shelves as specified under "Shelving".

Doors as specified under "Doors" section.

Secure units to wall with stainless steel fastenings.

.21 Shelving

1.6mm stainless steel all welded Construction.

Boxed edges on all four (4) sides. Notch corners to fit contour of legs as required for work tables.

Shelves with sides or backs shall be turned up 50mm and set to backs or folded if away from walls.

Shelves shall be easily removable and in sections capable of being pulled out through a single door opening.

Overshelves to be boxed with backs set to walls and secured with stainless steel tubular brackets.

Wire shelves to be 5mm O.D. on 25mm centres, set in a 10mm O.D. perimeter frame either stainless steel or heavy duty chrome plated finish as specified.

g) Provide a removable bottom shelf in any counter or table set on an enclosed base with mechanical and electrical services.

Removable bottom shelf in counters or tables with sink for access to clean-out valve on trap.

.22 Angle Slides

1.6mm stainless steel Construction

Slides shall be of 50mm x 50mm section, length to suit. Leading corners rounded, fully welded to supports on vertical edge (for fabrication) or secured by no less than four (4) s.s. screws (for millwork)

c) Round exposed corners and provide back stops. Mount units in key hole slots to ease cleaning and removal.

Back stops to be provided to limit travel.

Verify tray, pan or basket size to ensure accurate fit.

.23 Drawers

Front shall be double pan Construction with insulation equal to cabinet body. Where drawer fronts are shown to have a plastic laminate finish, the double pan Construction shall be reversed so that the plastic laminate is contained by the outer edges of the back pan.

Frames shall be 1.6mm. stainless steel channel, welded to drawer front.

c) Pulls shall be formed of stainless steel and welded onto the top edge of drawers.

d) Slides for refrigerated cabinets shall be Component Hardware S52 series; for other drawers Component Hardware S26 series as specified under "Hardware".

All slides to be installed so that drawers are self closing.

f) Housing of 1.0mm stainless steel fully enclosed for drawers under worktables and open cabinets.

Drawers shall accommodate one plastic pan Component Hardware S80 series or one stainless steel pan Component Hardware S81 series for 510 x 510 x 125mm insert.

h) Provide rubber buttons at end of frames to cushion drawer.

i) Locks as specified under "Hardware".

j) Bread drawers shall have 510 x 510 x 250mm deep stainless steel removable pan.

.24 Sink bowl

All of 2.0mm stainless steel integrally welded into table or counter top.

Interior corners radiused 19mm both vertically and horizontally, all welded and polished. Slope bottom to drain fitting.

Undercoat with sound deadening compound when sinks are not exposed.

Multiple sinks to have 18 ga. stainless steel apron to conceal gap between bowls.

Faucets and drains as specified under "Hardware".

.25 Hinged and sliding door

Front and back of 1.6mm stainless steel.

All welded, double pan type 19mm thick sound deadened with fibreglass insulation board.

c) Hinges for cabinet doors shall be concealed, continuous stainless steel piano type secured to body with stainless steel screws.

Sliding doors shall be top hung with a stainless steel track mounted above to allow self closing. Provide nylon rollers with ball bearing centre except for heated cabinets where stainless steel rollers shall be used. Doors must be removable without tools.

Provide rubber buttons to cushion doors.

.26 Unheated cabinets

Stainless steel tops and backsplash. Top edges boxed, backs up and splayed unless otherwise noted.

1.2 mm stainless steel body.

Door to be hinged or sliding as required.

Stainless steel pilasters for adjustable shelves c/w clips.

1.6 mm stainless steel fixed bottom shelf and removable intermediate shelf.

Legs as specified under "Legs and Bracing"

.27 Heated cabinets

Stainless steel tops and backsplash as for unheated cabinet.

1.2 mm stainless steel body, fully insulated with 13 mm thick fibreglass and stainless steel 2B interior finish.

c) Doors to be hinged or sliding and insulated as specified under the "Door" section.

Stainless pilasters and clips.

Removable and perforated intermediate shelf.

f) Fixed bottom shelf.

Legs as specified under "Legs and Bracing".

Maintain a minimum temperature of 160 deg. F (71 deg. C) within the cabinet.

Heater strip shall be chromolox type c/w thermostatic control and pilot light mounted in a recessed panel.

.28 Steam tables and bain maries

Stainless steel top and backsplash.

Construction as per "Heated Cabinet" unless specified otherwise.

Heating tank shall be an integral, all welded unit with the top. Cove all corners and slope bottom to drain equipped with overflow assembly.

Perforated false bottoms shall be stepped in varying heights and easily removable in sections c/w finger holes.

Insulate heating tank with 25 mm rigid fibreglass.

Provide chromolox type immersion heater c/w a low water cut off and a minimum heating capacity of 3.0 Kw per sq. m. of bain marie surface or 1.3 Kw per standard full size pan section of steam table.

Recess thermostatic controls and pilot lights into front of cabinet.

h) Manifold all multiple drain outlets to a common and larger diameter header. Trap the header as required by local codes.

Steam heated units shall have 19 mm diameter copper coil assembly to maintain a 95 deg. C water temperature within the tank.

Provide recessed steam control valves and insulate all exposed steam piping within the cabinet.

.29 Prefabricated, insulated walk-in type refrigerated and frozen room assemblies

Materials

Stainless steel sheet metal (min. 24 ga): to CSA G1110.6 1968 type 304 with No. 4 finish.

Galvanized steel sheet metal: commercial grade to ASTM A526-M81 with galvanized zinc coating to ASTM A525-M80, Designation Z275.

Mild steel: cold rolled sheet to SAE 1010 to 1020 suitably prepared for the specified finish.

iv) Aluminum sheet metal: utility sheet with "stucco" pattern finish unless otherwise indicated.

Sealant: silicone sealing compound, eg. Dow Corning Silastic 732 RTV silicone adhesive/sealant.

vi) Asphaltic paint: to CGSB 1-GP-108c, type 1.

Insulation shall be foamed-in-place polyurethane injected into the panels to form a rigid wall without the use of wood or metal structural members. Insulation shall have a "K" thermal conductivity factor of not more than 0.86 watts per square metre per degree Kelvin for a temperature difference of 38°C (100°F) and shall be rated as self extinguishing, fire retardant type. Overall wall thickness shall be a minimum of 76mm (3"), having a density of 40 kg per cubic metre.

Factory fabricate the exterior and interior walls, ceilings and floor panels using steel pressure dies and maintain uniformity.

Construction

All pre-fabricated insulated wall and ceiling panels shall bear a stamp indicating ULC approval.

Panel sections shall consist of exterior and interior metal pans with die formed flanged edges. Section edges shall have a matching tongue and groove profile to ensure self-alignment and to provide a

continuous foam-to-foam airtight contact, when panels are locked into place. Flexible vinyl gaskets may be used in addition to the continuous foam-to-foam airtight contact.

Silicone between all panel joints to provide a clean finished appearance and to form air-tight vapour-proof joints. No wood framing to be used in wall or ceiling panels.

Panel sections shall be of modular Design, assembled with eccentric locking devices, or approved equal, actuated from the interior of any of the rooms and enabling sections to be erected within 38mm of any Building room, column and ceiling.

Steel for all panels to be painted shall be Satincoat or approved alternative, 0.595mm thick minimum. Paint shall be baked white enamel in two coats. All exterior panels not exposed to normal view to be 0.792mm core galvanized steel.

Door panels shall be insulated and finished as per exterior and interior panels with a minimum 865 x 1980mm clear door opening. Ensure that doors will close and seal opening.

Infitting flush hinged type doors (swing as indicated in item description) to fit door openings, insulated and finished same as panels, complete with 1015 high x 1.6mm thick stainless steel kick plates on both exterior and interior, as well as soft thermoplastic gaskets with magnetic steel core at top and both sides and adjustable rubber wiper gasket at bottom. Gaskets to be oil, fat, water and ultra violet resistant and to be replaceable.

Door hinges shall be self-closing type, with stainless steel pin and nylon cam-type bearing, of satin finished aluminum.

Latches to match hinges, for opening door by breaking force of trigger-action door closer and magnetic gasket. Latch to be capable of being locked with padlock and to have safety release handle. Adjustable sliding gasket on the bottom of each door. The magnetic force of the gasket must be sufficient to keep the door closed and airtight.

x) Foot treadles to match hinges and latches, for opening door without use of hands.

One trigger-action positive door closer, located on exterior, to assist in positive closing of door.

Anti-condensation heater cables shall be supplied and installed on all walk-in doors at gasket contact area, in snap-on channel, providing sufficient heat to prevent condensation and frost formation. Heaters across sill shall be protected with removable 1.60 stainless steel cover plates or angles. Heaters shall be inter-wired at factory, terminating in a junction box located on top of prefabricated insulated refrigerated and frozen room assemblies, ready for connection by electrical trades.

Provide appropriate number of LED fixtures to ensure a 70 foot/candle (light intensity) at working level.

xiv) Where 4’ long double tube LED lights are specified for walk-in type refrigerated and frozen room assemblies provide vapor proof type fixtures with electronic rapid start low temperature ballasts (-29 C) and standard 120 Volt switches. Double tube 4’ long LED fixtures to operate on 120/60/1. Terminate wiring for lights in junction boxes

located on top of the prefabricated insulated refrigerated and frozen walk - in type room assemblies, ready for final connection by electrical trades. Use three way switches if more than one door is specified.

xv) Provide and mount additional light fixtures for rooms with a floor area greater than 80 sq. ft. (7.43 metres square).

xvi) Each door panel section shall have on the latch side, approximately 1676mm above the finished floor, an operating toggle switch and pilot light, inter-wired within the panel to an interior fluorescent vapour proof light fixture complete with light tubes and suspended from ceiling panels.

xvii) Wiring shall terminate in a junction box on top of the prefabricated walk-in room, ready for connection by electrical trades. Use three-way switches if more than one (1) door is specified.

xviii) Provide L.E.D. readout thermometers to provide temperature readings from -40 C to +15 C and mount on latch side of door panel approximately 1525mm from floor. Cover sensing bulb with protective metal cover, same finish as walk-in.

xix) Two-way pressure relief port shall be installed in freezer door panel and refrigerator door panels in rooms operating at +2 C or less. Anti-sweat heater cables in frame of port to prevent intake and exhaust ports from freezing. Vent port to be pre-wired within panel.

xx) Where walk-in rooms are floor less, wall panels are to be fastened to screeds in lieu of floors; 76mm high screeds are to be of similar Construction material and insulation to wall and ceiling panels. Screeds are to be installed plumb and level and secured to finished Building floor.

xxi) Supply and installation of an alarm system for each prefabricated walk-in refrigerated and frozen storage room. Install the removable alarm system control box on the outside of each room. Supply and install inter-wiring from alarm system to junction box installed on top of each room. Alarm system shall be equipped with one contact for auxiliary remote alarm. Equip with temperature sensor, mounted inside prefabricated rooms and connect to the alarm system control box. Immerse capillary tube sensor in glycol bath. Run all wiring between the alarm system and junction box on top of prefabricated room through conduit and down inside of prefabricated wall panels to alarm system. Wiring shall not be exposed.

xxii) Removable closure panels shall be installed from lower edge of erected ceiling panels to finished Building ceiling and cover strips or angles to extend from Building floor to ceiling closure panels between exposed ends of walk-in boxes and Building wall. Closure panels, cover strips or angles to match finish of exposed exterior wall panels. Provide removable ventilation panels in front of each condensing unit.

xxiii) Supply and installation of bumpers on all exposed exterior walls. Bumpers constructed of a solid hardwood base, 50mm X 200mm, clad with 1.6mm stainless steel. Fasten to pre-fabricated walk-in refrigerators and freezers with matching brackets mounted 300 mm from centre to finished Building floor. Tops and vertical ends, where bumper makes contact with wall panels, are to be sealed.

xxiv) Supply and installation of a 1.6 mm stainless steel protective plate

300mm high at 100mm above the finished floor, No. 4 finish all around the interior of each prefabricated refrigerated or frozen storage room. Factory mount a 1.3mm galvanized steel reinforcement in the interior of the prefabricated walls.

xxv) Supply and installation of 2.8mm stainless steel corner guards 150mm x 150mm x 1830mm H on all exposed exterior and interior corners.

xxvi) Openings through walls or ceilings for electrical, plumbing or refrigeration lines must be sleeved, fit with grommets and sealed with an approved sealant.

xxvii) Prefabricated walk-in refrigerated and frozen storage rooms shall be fabricated to comply with Canadian Standards Association. The CSA label shall be affixed to the interior door jamb.

xxviii) Prefabricated insulated wall and ceiling panels specified for refrigeration systems must meet the requirements of the B.C. Building code.

Mechanical refrigeration systems

Supply and installation of all mechanical refrigeration equipment and controls for refrigerators and freezers to form a complete and functional system.

The refrigeration system to include a rack Design (similar to Hussmann Protocol or Hill Phoenix).

Each individual system shall be sized to suit the internal space, ambient temperatures and humidity levels of surrounding areas, product type and load, heat infiltration and temperature of incoming product in order to maintain the specified holding temperatures.

Design compressor and coil capacity on a 16 to 18 hour day compressor operation in 32.8 C ambient temperature maximum.

v) Design refrigeration equipment for use with Freon R448A for refrigerators and freezers (high, medium, and low temperature applications).

All condensing units 3/4 H.P. or greater if specified shall be Scroll complete with motor, water cooled condenser, receiver, compressor, suction and discharge valves, oil separator, high/low pressure controls and all other necessary components mounted in a flexible manner on a common base with all service valves and controls readily accessible and easily serviceable.

vii) Evaporator (coil) to be forced convection unit cooler type, made to be suspended from ceiling panels. Forced air discharge to be parallel to ceiling. Air circulation motor, multi-fin with tube type coil and grill to be assembled within protective housing. Expansion valve, with strainer, heat exchanger inlet and outlet service valve connections also to be contained within housing.

Construct evaporator entirely of non-corrosive materials. Air circulation motors to be life-time sealed and entire unit-cooler assembly readily accessible for cleaning.

ix) Evaporator (coil) shall be equipped with mounting brackets, stainless steel drip pan, drain connection and required controls for a safe and

satisfactory operation.

x) Mechanical refrigeration systems used for freezer applications shall have an automatic electric system for defrosting including heaters and time control. Defrost to be time initiated and temperature terminated with built in fail safe control and fan delay switch.

xi) Thermostatic type expansion valves, all metal, moisture proof with gas charged bulb clamped to suction end of evaporator (coil). Freezers with 10 P.S.I. expansion valves.

xii) Equip each prefabricated walk-in refrigerated or frozen storage room and refrigerated preparation/assembly rooms with a room thermostat to control solenoid valve. Mount solenoid valves on liquid lines, close to the cooling unit to control flow of refrigerant.

xiii) Condensate drain lines from evaporators (coils) to ensure a fall of 25mm in 610mm.

xiv) Install a PVC sleeve in the walk-in refrigerator wall where any pipe passes through. The sleeve shall be larger than the penetrating pipe to allow for a "permagum" packing and vapour seal.

xv) All refrigeration piping shall be type "L" copper tubing hard drawn with "silfos" brazed joints, verified free of leaks. Completely dehydrate piping before charging with refrigerant.

xvi) Joints at equipment on lines 16mm O.D. and smaller shall be made with flareless compression fittings, Swagelock or Imperial "Hy-Seal". Joints on lines larger than 16mm O.D. shall be wrought copper solder joint fitting, with adaptor fittings where screwed connections are necessary.

xvii) Installation of piping shall conform to applicable requirements of ANSI code for Pressure Piping, Section on "Refrigeration Piping" and CSA Standard for "Mechanical Refrigeration Code". Refrigerant piping to obtain a pressure drop of less than 23 kPa per 50 metres in suction lines and 47 Kpa per 50 metres in liquid lines. To increase the velocity and assure proper oil return, install smaller diameter vertical risers on suction lines.

xviii) All new refrigerant piping is to be pressure tested with dry nitrogen and properly evacuated before recharging with refrigerant.

xix) All refrigerant piping shall be properly identified as to service and direction of flow.

xx) Use 'home-run" refrigerant piping Design.

xxi) Insulate suction lines with 16mm thick Armaflex, 19mm thick on freezer system; or approved equivalent fire retardant pipe covering, installed in strict accordance with the manufacturer's recommendations. Tape liquid and suction lines together.

xxii) Testing and evacuation procedure shall conform to ANSI B31.5 and test pressure shall be in accordance with CSA Code.

xxiii) Evacuation shall be accomplished by the use of a vacuum pump to ensure removal of all moisture and non-condensable gases.

xxiv) Provide all refrigerant required for charging and placing the system in proper operation. Charging shall be done through a new filter dryer

and completed by a licensed refrigeration contractor holding a valid ODP.

xxv) If specified, equip all water cooled condensing units on a re-circulating Building-chilled glycol water system with a three-way flow control valve. Balance control valve on the water line entrance and discharge valve filter before water flow valve, thermometer on water entrance and discharge. Supply and install three (3) gauges to measure the pressure in the water circuit: one (1) before the filter; one (1) after the filter; one (1) at discharge end of condenser. Operating conductors shall be closed loop cooling, 8.9 C supply water, 15.5 C return water.

.30 Exhaust ventilators and hoods

The basic requirements of the Design, installation and use of exhaust systems components including ventilator(s) (hoods with or without dampers) exhaust ducts, air moving devices, fire suppression systems, and auxiliary equipment shall be supply and installed in accordance to the current edition of the NFPA-96 and NFPA-17a, and ULC standard ULC-S646-98.

Fabricate hoods of 1.25 mm stainless steel type 304, No. 4 finish with joints and seams fully welded and liquid tight.

Provide self-closing dampers if so listed by U.L.C. and approved by authorities having jurisdiction.

Duct collars shall be 1.6 mm stainless steel all welded c/w 25 mm flanged perimeter connection.

Drains from multiple hood sections shall be manifolded to one common connection.

Lights shall be LED recessed vapour type fixtures c/w bulbs. Standard hoods shall have Klein # 2310 incandescent vapour proof fixtures c/w bulbs.

g) Stainless steel removable enclosure panels shall be provided from top of ventilators to underside of finished ceilings.

h) Provide a 1.25 mm stainless steel service chase approximately 300 X 200 mm to enclose services from top of service wall to underside of ventilators or hoods.

i) Provide the required and engineered number of U.L.C. grease extractors for filter type exhaust hoods. Extractors constructed of stainless steel frame with stainless steel interior air baffles and strategic weep holes to allow drainage into grease trough.

j) Grease trough shall be one piece, at back of hood and below extractors c/w a removable 150 x 150 x 100 mm grease container drawer.

k) Support and hang ventilators and hoods by means of mild steel threaded rod, secured to structural ceiling member. Utilize turn-buckles to ensure a plumb and level installation.

.31 Condensate Hoods

Fabricate hoods of 1.25 mm stainless steel type 304, No. 4 finish with joints and seams fully welded and liquid tight.

Provide removable s.s. condensate baffles.

Duct collars shall be 1.6 mm stainless steel all welded c/w 25 mm flanged perimeter connection.

Provide 13mm s.s. condensate drain coupling and condensate trough.

Stainless steel removable enclosure panels shall be provided from top of condensate hoods to underside of finished ceilings.

Support and hang condensate hoods by means of mild steel threaded rod, secured to structural ceiling member. Utilize turn-buckles to ensure a plumb and level installation, ready for duct connection.

.32 Fire Suppression System

The basic requirements for the Design, installation and use of a pre-engineered fire suppression system shall be governed by the current edition of the NFPA-17a, NFPA-96, ULC listed, and acceptable to the local authorities having jurisdiction.

b) The hood manufacturer shall supply a wet chemical fire suppression.

The hood manufacture shall provide a pre-piped fire suppression system with full coverage in each hood, plenum and duct collar. Each fire suppression drop shall extend from the roof of the hood and shall be chrome plated or stainless steel pipe or sleeve. The complete coverage of each hood will allow appliance(s) to be relocated and/or removed and/or added to any hood without requiring any changes to the overall capacity of the Piranha system or re-location of the fire suppression drops. (Exception: Appliances requiring specific nozzle location per the ULC listing. i.e. Salamander Broiler, Upright broilers)

The hood manufacturer shall provide detector(s) factory installed in each hood and wired to a common junction box on top of each hood. The quantity and location of the detectors shall be in accordance with the ULC listing and the Owner having jurisdiction.

A fire condition shall cause the system to automatically discharge above the hazard areas and extinguish the fire.

f) On discharge of the system, all fuel and power to cooking equipment shall be shut off automatically by means of a mechanical or electrical (if so specified) gas valve for gas equipment and/or under voltage shunt trip for electrical equipment.

Provide mechanical or electrical, if so specified, remote fire pull stations at the kitchen exit(s).

h) System discharge nozzles shall have grease caps.

The hood manufacturer shall supply and install all field and factory piping in accordance with the ULC listing of the fire suppression system. Conceal all piping above the roof of the hood whenever possible. All exposed piping to be stainless steel or chrome plated and/or sleeved.

The system shall be installed to the manufacturer's specifications, by qualified representatives and in strict accordance to all applicable codes.

k) Supply and installation of the field piping from the hoods to the fire suppression system shall be by the hood manufacturer in accordance with the ULC listing. The hood manufacturer to supply all detection devices, release mechanisms and other accessories and components to form a complete operational and approved system.

The hood manufacturer to supply and set-in-place manual remote pull station for the fire suppression system(s) as required by the local authorities having jurisdiction.

.33 Conveyor systems

Slat belt conveyor

Belting shall be type "HDF" plastic slat chain belt and shall side-flex to a minimum 610 mm centerline radius as shown on drawings. The plastic slats shall be 190 mm wide and made of a wear-resistant, extra-low friction engineering plastic. Individual slats shall be joined to form a continuous belt be wear-resistant stainless steel pins.

Top Track

The belt shall be supported on a standard 2.0 mm, 304 stainless steel No. 4 finish bed with no visible joints. The belt shall ride on high density polyethylene wear strips in the centre line support groove running the full length of the conveyor.

c) Return track

A monorail type return track shall consist of an extruded or machined cross-section of high-density poly. Contained in a stainless steel "C" channel arranged in an inverted position so as to support the conveyor belt from its tabs in a hanging position. A full-width stainless steel pan under the belt, located approximately 1/8" below the surface of the suspended belt slats shall allow water from the belt wash to be carried to the tail tank by the action of the belt.

Drive Frame

All welded stainless-steel angle frame with stainless steel 406 sq. mm 150 mm lg. legs and adjustable stainless-steel bullet feet.

Drive Tank (Wash Chamber)

Wash chamber shall be 2.0 mm stainless steel equipped with one single, large size access door of drop-hinge Design to positively prevent splashing and leaking when door is closed. Door to be equipped with positive cabinet-type latch.

Provide removable, lift-out scrap basket of perforated stainless steel. Scrap basket to be accessible through same access door.

iii) The drive tank shall support the bearings, drive shaft and sprockets for the transfer of motive power from the motor to the conveyor belt.

iv) The driving chain shall be number 50 ASA (15 mm pitch) and shall be located on the front side of the conveyor for easy access.

f) Drive Housing

The conveyor drive tank (wash chamber) and drive frame shall be fitted with 1.25 mm ga. stainless steel enclosure panels on the ends (& rear when exposed) and (a) a 1.6 mm ga. stainless steel hinged, screwed shut door on the front to act as a chain guard for the drive sprockets and chain, accessible only by authorized personnel; and (b) a 1.25 mm ga. stainless steel double-wall insulated hinged door also on the front side with spring-loaded cabinet latches. Door to allow easy access to drop-hinge door on drive tank wash chamber and scrap basket.

g) Drive Shaft

Stainless steel drive shaft mounted within wash chamber on double-sealed bearings. (Grease-filled) sealed cartridge inside chamber; standard precision ball bearing flanged unit outside chamber.

Belt Wash

Wash system shall consist of spray jets mounted to manifolds inside wash chamber. Manifolds to be located so as to effectively clean the belt and shall be removable without tools.

Plumbing Cabinet

A stainless-steel cabinet shall be mounted to end of drive cabinet to house required plumbing for the belt wash system.

Plumbing components shall be 13 mm brass or copper fittings consisting of: hot and cold water shut-off/mixing valve, line strainer, check valve and solenoid valve. (Ensures water is on when conveyor is operating - with selector switch in "Wash" or "Rinse" position).

Provide adjustable flow liquid proportioning injector to supply detergent from a remote container and inject it directly into the water line before entering the spray manifolds.

iv) All plumbing and plumbing components to conform to the latest CSA, UL and local codes and standards.

Drive Motor

Provide adjustable-speed integral D.C. motor and worm-gear speed reducer. Speed is to be varied by turning control knob on conveyor control panel.

k) Control System

Conveyors shall be controlled by a watertight control centre containing start, stop, detergent and belt spray switches, indicating lights and speed control potentiometer knob.

ii) The D.C. motor shall be controlled with an "SCR" solid-state controller with overload protection, electronic torque control and an infinitely variable conveyor speed between 0 and 15 metres/min.

iii) Provide a 3-pole sealed disconnect circuit breaker and control transformer. All components shall be neatly contained in a stainless steel, completely waterproof enclosure. All wiring to conform to latest CSA, UL and local electrical codes and standards.

Provide auxiliary start-stop panels and accumulation switches where required to assure efficient operation of system.

l) Tail Tank

Provide 2.0 mm stainless steel tail tank 380 mm deep with drop-hinge access door equipped with positive cabinet-type latch. Provide large, lift-out perforated stainless steel scrap basket.

Tail shaft (stainless steel) and stainless steel sprocket assembly to be contained in tail tank and mounted on slides and equipped with a spring-loaded take-up.

.34 Power roller conveyor

Construction

Support structure shall be constructed on 2.0 mm stainless steel side channels c/w stainless steel covers. Drive unit housing located where shown on plan shall be 2.0 mm stainless steel Construction and shall be easily accessible for servicing.

Rollers

Rollers shall be 48 mm dia. 1.6 mm stainless steel tubing fitted with self-lubricating acetal bearings. The rollers shall be mounted between the side channels and no part of the roller extending into the side channels.

Driving System

The rollers shall be mounted 13 mm dia. stainless steel shafts that extend into the side channels through all-plastic self-lubricating bearings. The drive end of the shaft is fitted with an easily replaceable polyethylene sprocket. The sprocket (& shaft) is driven by a continuous stainless-steel chain which runs on polyethylene wear strips on top and return strands.

d) Gear Motor

i) The conveyor gear motor drive shall be totally enclosed, fan-cooled type with corrosion-resistant finish.

Controls

The conveyor shall be controlled by a water-tight panel located under the dish table or any other suitable location where it is easily accessible to maintenance personnel only. The panel contains all required electrical components including magnetic starter with overload protection and necessary fusing.

The conveyor is operated by remote start/stop stations located where shown on plan. Inter wiring from main control centre to remote panels.

Operation

The conveyor shall operate as a low-pressure accumulation system. Rollers shall turn independently of sprocket and shaft combination.

.35 Gravity roller

Rollers

Rollers shall be 48mm dia. blue PVC fitted with polypropylene bearings with stainless steel balls. Rollers shall be spaced at approximately 100 mm centres and where conveyor turns a corner, each roller shall consist of two separate rollers on a common shaft.

Shafts

Shafts shall be 11 mm hex. aluminum securely bolted to side rails. "Floating axles" shall not be permitted.

Guide Rails

Guide rails to be 2.5 mm X 50 mm stainless steel supported on 12 mm dia. "pins" secured to sides of conveyor bed. Rails to be made in approximately 1200 mm lg. sections to allow conveyor to be lifted out of bed for cleaning purposes.

Conveyor Bed (Drip Pan)

Provide 2.0 mm stainless steel conveyor bed/drip pan under conveyor supported on 40 mm dia. stainless steel legs and rails and adjustable stainless-steel bullet feet.

Conveyor bed to be properly pitched to allow baskets to roll freely from powered section to dishwasher.

Hinged Gate

Provide a 900 mm lg. hinged gate at entrance to dishmachine. Gate to be equipped with an adjustable, off-centre counterweight to enable the gate to be raised with little effort by one person and remain safely in the raised position without the need for dead-bolts, latches or locking devices. Gate shall be slightly over-balanced to allow it to remain in the "down" position after lowering.

.36 Polycord conveyor

Construction

Conveyor to be constructed of 2.0mm stainless steel conveyor bed as shown of plan to accept twin polycord conveyor belts. Belts to be supported on polyethylene wear guides suitable space to reduce drag and eliminate wear on the s.s. conveyor beds.

Where conveyor turns a corner, belts shall be supported on machined Delrin idler pullies. Provide sufficient number of rollers to ensure smooth transfer of product around curves.

The belts shall return under the s.s. bed and shall be supported on PVC rollers and Delrin pullies specially grooved to accept the belts.

iv) Conveyor manufacturer to verify tray dimensions to ensure appropriate spacing of polycord conveyor belts.

Conveyor Belting

Provide twin strands of round polyurethane belting, 13mm diameter endlessly joined by thermal welding.

On longer conveyors, generally considered to be over 7600mm, or for conveyors with an unusual number of curves, belting shall be "Can-cable", of a durometer suitable for the length of the system involved. "Can-cable" to contain a woven nylon core to eliminate undue stretching.

Drive Frame

i) Provide all welded stainless-steel angle frame with 40mm s.s. legs 150mm long with adjustable s.s. bullet feet. This frame shall support the bearings, drive shaft, secondary shafts, belt drive pullies and motor/reducer. Entire drive motor assembly shall be mounted on movable s.s. angle frame which shall be vertically adjustable to effect tensioning in the polycord belts. Tensioning adjustments shall be accomplished by loosening nuts on threaded rods and moving motor down to tighten belts. Nuts shall be re-tightened to fix motor in place. "Floating" frames shall not be permitted.

Drive Housing

Provide 1.2mm stainless steel enclosure panels on ends, and rear where exposed. Provide a horizontally split double door for access to drive housing. Top door to be screwed shut for access to moving parts by service personnel. Bottom door equipped with a simple spring catch for access to a slide-out drawer by operating personnel.

Drive Components

All drive and idler shafts to be stainless steel; belt pullies to be machined or moulded Derlin. Bearings and pillow blocks to be precision ball bearings, lubricated for life.

Drive Motor

This sub-contractor to provide integral motor/reducer, sized to suit Project. Reducer equipped with a double output shaft for mounting of main drive pullies. Motor is D.C. type, 90 or 180 volt, to facilitate electronic variable speed.

Control System

Conveyor shall be controlled by a watertight control centre containing start/stop buttons, indicating lights, speed control potentiometer knob, and main disconnect switch. The D.C. drive motor shall be controlled with and "SCR" solid-state variable-speed controller with overload protection and electronic torque control.

Provide a 2-pole disconnect circuit breaker and control transformer (24 volt secondary). All components shall be neatly contained in a s.s. waterproof enclosure. Wiring to conform to latest CSA, UL and local electrical codes and standards. Provide auxiliary start/stop and accumulation switches as required.

Tail Assembly

Provide stainless steel tail frame structure suitable reinforced to support s.s. tail shaft and pullies. This frame to be mounted from underside of s.s. conveyor bed.

i) Idler Pullies (return side)

Provide PVC return rollers on straight sections, and a combination "enter/exit" spool and pulley system on curves to ensure accurate belt tracking.

j) Safety Blocks

Provide UHMW-polyethylene guide blocks where belts enter and exit the top conveyor bed - (4) locations.

9.11.4 Please see attached.

Attachment 2K-1 – Food Service Equipment List

9.12 APPENDIX 2L ROOM FINISHES MATRIX

9.12.1 Please see attached.

9.13 APPENDIX 2M PATIENT LIFT MATRIX

9.13.1 Please see attached.

9.14 APPENDIX 2N CLIMATE DATA SET

9.14.1 Please see attached.

Attachment 2N-1 ASHRAE Spreadsheet

Attachment 2N-2 CDH Building Code Spreadsheet

9.15 APPENDIX 2O PLANT LIST

9.15.1 Please see attached.

9.16 APPENDIX 2P ASSET MANAGEMENT

9.16.1 Application

This section provides a framework for Asset Management matters that are to be considered during the design and construction phases for the CDH redevelopment. The Owner is seeking an asset that endures for its design life and meets asset management criteria with optimized whole life cost (WLC).

9.16.2 Definitions

For the purposes of this Appendix only, the following definitions shall apply:

"Assembly" means the Components and Equipment that together encompass the "Assembly".

"Components" means the base elements of a building, the combination of which then make up Equipment, Assemblies, and/or Systems.

"Equipment " means the individual item or device that encompasses Components.

"Indicative Lifecycle Model" means a 30-year and 50-year estimate for major component, Equipment, Assembly or System refurbishment, partial replacement, or replacement.

"Indicative Maintenance Model" means an estimate of the annual planned preventive maintenance that is required to keep the facility in optimum operating condition.

"Owner Project Requirements" means the dynamic documents that contain the necessary explanation of the ideas, concepts, and criteria that are considered to be essential to the owner, including performance expectations, all as described in Schedule 2, Alliance Works and Project Description and Schedule 7, Alliance Management System and thereby act as a basis for the preparation of the Commissioning Plan and Commissioning Manual.

g) "Systems" means the Components, Equipment and Assembly that together encompass the "System".

9.16.3 Abbreviations

For the purposes of this Appendix only, the following definitions shall apply:

CDH – Cowichan District Hospital

FMO – Facility Maintenance and Operations

IPAC - Infection Prevention and Control

d) KRA - Key Result Area

e) O&M – Operations and Management

OOS – Owners' Operating Staff

OPR – Owner's Project Requirements

h) SC – Substantial Completion

i) WLC – Whole Life Cost

9.16.4 Introduction

Asset management is an integrated approach to optimising the life of a facility beginning at conceptual design and ending at a point of de -commissioning. During the intervening time, the Facility Maintenance and Operations (FMO) team are tasked with the maintenance and lifecycle responsibilities for the facility, assets, and systems.

.2 Concept design principles are set out in various sections in Schedule 2, with the structure meeting or exceeding the requirements of CSA S478 with a 50–99 year lifespan.

Design life objectives for the facility can only be accomplished if the building fabric, assets, and systems that support the facility are maintained, upgraded, refurbished, refreshed and/or renewed at points in the life of the facility.

.4 It is therefore incumbent that Participants ensure the design intent is applied during construction, start-up, and handover phases and that the design team employ a best practice approach during the design process that balances the varying design complexities of a new facility while accounting for the future needs of the facility.

9.16.5 Overview and Focus

The Owners' Operating Staff such as the Facilities Maintenance and Operations (FMO), Protection Services, and Environmental Services teams contribute to building performance by managing operations that integrate people, location, process, and technology to ensure the site and built environment's functionality.

.2 These responsibilities extend for the life of the building and never subside. It is crucial that the design process accounts for these responsibilities and enables continued core business outcomes by permitting the building to be maintained, upgraded, refurbished, refreshed or elements renewed throughout its life.

There are several key components that provide for an efficient undertaking of ongoing FMO obligations as well as support a successful handover of a construction project to operations. These elements can be summarised as follows:

Design for Operability and Maintainability (DfOM) - Thoughtful design and equipment selection are critical in terms of safety, maintainability, operability, and whole life operational costs that together, minimises any disruption.

b) Quality Assurance – A robust Quality Assurance system that provides confirmation that design intent is adhered to and applied during construction, including the quality aspects and ultimate selection of assets.

Commissioning - A robust commissioning and post-commissioning optimisation process to confirm design and construction objectives and execution, energy efficiency targets are confirmed and achieved, full infrastructure functionality and to minimise defects and service disruption during operations, commencing in the design phase (this is set out in detail at Appendix 2H Commissioning).

Start-up and handover- A complete, concise, and accurate site knowledge and information transfer of the newly built environment to the FMO and end user teams.

.4 This appendix provides the background information that supports the Owners' Operating Staff team by highlighting aspects of Design and construction influence that are critical to ensure value-based maintenance objectives can be met for the life of the Facility.

9.16.6 Design for Operability and Maintainability

The first step toward a successful maintenance and lifecycle program at CDH is to acknowledge and utilize the concept of DfOM as part of the project Design deliverables. It establishes a connection between the organization's maintenance and lifecycle objectives and the Design process and stresses the critical nature of combining architecture and adjacency space planning, infrastructure Design, planning and installation expertise with operational and maintenance practice.

Real benefits can be realised using this methodology during the project Design and construction period (minimising re-Design and re-work) and during the lifetime of the facility (mitigating potential risk and future maintenance, energy consumption and lifecycle costs) and providing a safe environment for maintenance staff to carry out their obligations.

.3 DfOM is the practice of incorporating operations and maintenance expertise into the planning and Design processes to ensure the safety, simplicity, and economy of maintenance activities over the life of the infrastructure. It enables the settlement of operational and maintenance issues in advance and removes avoidable maintenance requisites, which may result in reduced maintenance costs and staffing. The Participants are to have expert resources available to the team to support this DfOM.

.4 The four central concepts of DfOM are as follows:

Encourage simple maintenance – Designers are to consider isolation, deenergization, and re-energization methodology, standardization, self maintained and prefabricated parts to facilitate quick inspection and isolation, efficient maintenance, and the associated influence on required spare parts stockholding. Additionally, the avoidance of unnecessary complex components and systems is encouraged where equivalent simple solutions are available unless beneficial value and/or perceived operational improvements are confirmed by the Owner.

The Design allows for quick maintenance procedures, such as fast diagnostic tests, component installation, and component disassembly/reassembly.

The Design and selection of systems support simplified troubleshooting opportunities that can typically be performed by the FMO.

Reasonable material selection may help reduce the frequency of cleaning, repair, and replacement.

Minimize maintenance interventions - Designers are to pay close attention to the performance and detailing of products to minimize common and critical defects.

i) Select products that have a history of ongoing manufacturer support that will remain readily accessible.

Use products that are both robust and consider climate change and future climate trends. Consider cutting-edge, high-performance materials that are low maintenance with optimized life expectancy.

In addition to aesthetics, Designers shall recognise a material's suitability in terms of its ability to resist defects caused by normal wear and tear (durability) and perform the expected functions over the Design life.

c) Maintenance access – Designers will account for all areas that require access for inspection, maintenance, and replacement incorporating appropriate Design and safety requirements including Infection Prevention and Control principles (IPAC) while minimising risk to clinical service delivery and patient impact.

i) Facilities and assets shall be able to be accessed, inspected, and

maintained with safety and ease without detriment to the maintenance operative including during adverse weather conditions. This is vital for enabling safe and productive routine servicing and maintenance work.

Access provisions will consider and be aligned to Owner's best practice IPAC guidelines and at a minimum be in accordance with the requirements of CSA Z317.12, Cleaning and Disinfection of Health Care Facilities and CSA Z317-13, Infection Control during Construction, Renovation and Maintenance of Health Care Facilities.

The access conditions must be safe, secure and provide adequate circulation and working space for maintenance operatives, donning and doffing of appropriate Personal Protective Equipment (PPE), repair devices, vehicles, and staff transporting tools, equipment, consumables, and component parts.

Adequate access must be provided for maintenance activities such as cleaning & washing, inspections, repair, and replacement of materials, parts, or equipment.

Remove or reduce the amount of maintenance needed at height or in confined spaces. Where this is not feasible, appropriate mitigation of the identified risk will be implemented as part of the Design.

Ensure, in the case of all installed plant, equipment, building systems and maintained elements that complete assemblies can be removed and reinstalled into the facility with minimal disruption to operations (clinical service delivery) or infrastructure alterations or reconfiguration.

Co-locating asset installation where possible in areas that minimise patient impact.

Forecast Maintenance and Lifecycle – Designers will consider the effect of their Designs and anticipated downstream maintenance and lifecycle activities in the Hospital environment to make appropriate upstream Design provisions and to include service continuity wherever possible.

Consider component standardization, modularization, as well as the use of prefabricated materials/components.

Meticulous detailing to avoid unnecessary risk of detrimental failure including staining, water infiltration, and premature degradation, as well as with ease of maintenance and asset replacement including adjacency provision and clinical service impact.

Strike a balance between aesthetics, expense, safety, and maintenance obligations.

Determine the most effective isolation, redundancy, and service continuity provisions for the installed assets wherever possible.

Review the ease of refurbishment, upgrade or replacement activities for sub assets, assets and systems and remove barriers and/or make suitable provisions.

9.16.7 Quality in Construction

A robust quality management program is critical to the overall success of the CDH project. The implementation of proactive quality control processes (that aim to prevent construction defects and minimise re-work) in conjunction with quality assurance

processes and procedures (that support effective information transfer and construction workflows) are essential elements that together, can support and provide for project success.

.2 As stated in Schedule 7 - Alliance Management System, and as part of the quality assurance system, Participants will develop a fully integrated and structured approach to the quality of the performance of the Alliance Works including the development of a Quality Assurance Management Plan.

Superior outcomes can be derived from the successful application and adherence of the Quality Assurance system during construction, especially in the lead up to SC and handover of the facility to the Owner's operational team.

9.16.8 Commissioning

The success of a healthcare project can be severely impacted where the quality of installation is poor and/or the commissioning process is proven to have failed. These two elements of the CDH project are key enablers to ensure success and are therefore of great significance to the Owner. The aspirations for the end goals of the commissioning process are a fully commissioned building that meets all clinical needs with all systems and functions working in harmony.

.2 The adoption of a superior commissioning process will benefit the project through improved energy efficiency, improved workplace performance due to higher quality environments, and most importantly, will support the mitigation and/or prevention of core clinical business interruption.

Refer to Appendix 2H Commissioning for a full account of the commissioning process for the CDH redevelopment.

9.16.9 Start-up and Handover

The intent of this section is to outline important items for Asset Management that are required to be fully addressed under Schedule 07 – Start Up and Hand Over Plan. Start-up and handover activities that support an effective transfer of responsibilities from the Participants to the Owner.

.2 Opportunities for knowledge transfer shall be maximised by the Participants during the project and in the lead up to Substantial Completion. Support for the initial term beyond Substantial Completion will include warranty, defect management, seasonal commissioning, support to clinical commissioning and end user training etc. Knowledge transfer is often linked to two main types being:

Tacit knowledge – Difficult to access, capture and share as individuals carry this knowledge in their heads on a subconscious level and may not communicate it often. It is considered valuable knowledge as it may provide context for experiences, ideas, people, and places.

Explicit knowledge – Easy to capture and store in databases and documents (policies, procedures, and manuals).

Structured - Informational elements are organised for future retrieval (databases and spreadsheets)

Unstructured – Information is not referenced for retrieval (emails, images, audio, video)

c) Participants will develop a plan and methodology that details an organised program of activities, records and information collection and handover, with sufficient and focused support resource that establishes and confirms an effective

transfer of knowledge, whether tacit or explicit, of the new facility.

9.16.10 Asset and Space Register

The intent of this section is to outline items for important for Asset Management that are required to be fully addressed under Schedule 07 - Design Management. Construction Management, and Record Management Plans. The development, management, and operation of a comprehensive inventory of installed assets within a complete, concise, and accurate asset register is a significant undertaking for any major project. This element of the overall transition from Design/Construction to Operations is significant and of high importance to the Owner's FMO to ensure maintenance objectives are met immediately following handover and therefore any infrastructure risks to clinical service delivery are minimised.

The development of the asset register starts at the Design stage with spatial identification and the decision and early adoption of Design software applications that supports the development of the register of assets as the project develops. System capabilities that link Design, assets, space and their associated attributes have significant benefits for the project and will enable an effective and efficient process to establish the list of spaces and assets, space and asset information/attributes and an early enabler that supports the need to establish maintenance strategies and associated set up activities by the FMO.

The nomenclature used to abbreviate asset and location particulars shall be hierarchal based with clear parent/child relationships and aligned to owner requirements.

.4 The location naming convention and code identification will be consistent across the facility relating to rooms, corridors, floors, roofs, buildings and zones for all spaces and virtual spaces within the Facility and the site. Spatial protocols and the list of associated attributes to be included within the register are to be developed and aligned to owner requirements.

.5 The Asset register inclusion requirements shall be developed in conjunction with the Owner and aligned to the existing FMO CMMS (Archibus) setup with agreed variations, as necessary. Non-Owner Participants to note that the register of assets will include installed assets that may not have regular or preventive maintenance, i.e., valves, doors, etc.

.6 Asset tagging is the responsibility and will be undertaken by the Participants with tags allocated in easily accessible and visible locations as agreed by the Owner. The specifics of the asset tag requirements, including barcode provision, size, colouring, numbering and sequence, and any other tag attributes will be developed in conjunction with the OOS and documented in a Participant developed asset tagging protocol.

.7 Asset attributes will be collected and included by Participants as part of the asset register with required mandatory fields completed in all respects.

A draft asset register is to be provided by Participants during the project timeline. The 1st draft shall be provided three (3) months following completion of the major architectural and engineering Design packages. This will be updated with a 2nd draft and submitted to the Owner twelve (12) months prior to Substantial Completion. A 3rd draft to be submitted six (6) months prior to Substantial Completion followed by final and confirmed asset register as part of the Substantial Completion handover package.

All deviations between the 3rd draft and final asset register will be separately identified by the Participants.

.10 The provision of the asset registers will be in CSV format with PDF document copy.

Provision of asset data in BIM suitable for use by FMO.

.12 All particulars will be developed in conjunction with the Owner.

9.16.11 Systems Operation and Maintenance & Data Manuals

Operations & Maintenance (O&M) is the largest cost component of owning and operating a facility throughout its lifecycle. The importance of well-written, userfriendly O&M manuals in terms of accuracy, relevance, and timeliness cannot be overstated to support the ongoing operations of the Facility.

.2 The Participants will prepare Systems Operation and Maintenance & Data manuals specific to the facility in accordance with item 4.14 of CAN/CSA Z8001. These manuals will contain all relevant asset information including clear explanation of the procedures, tasks, methods, equipment, tools, materials, recommended critical spares (type and quantity specifically related to the Facility) and recommended frequencies required for physical asset operations and maintenance.

Manuals shall be provided in a structured digital format via 'true' PDF using a non-proprietary software folder structure with a searchable, digitally created PDF hierarchal database. Individual files should be capable of being accessed through the CMMS.

.4 Manuals shall be created in a modular, building block format to facilitate the integration of new/additional data, such as Design/configuration adjustments, and to represent as-built conditions.

.5 User instruction will be incorporated in the manuals to effectively guide the reader to find relevant information related to the proper operation and maintenance of the assets.

.6 The draft manuals and/or sub sections shall be available no later than the system or asset's initial start-up/commissioning. Acknowledging the manual may be incomplete in some respects, using the manual at initial commissioning affords an additional opportunity for its contents to be verified against the installed system or asset/s. Final draft of manual will be reviewed by the Owner or their representatives and any identified deficiencies will require rectification prior to acceptance.

.7 As stated, each manual will be developed in accordance with CAN/CSA-Z8001 (or alternate standard or guideline as agreed by the Commissioning Authority and the Owner) and include the following information, at a minimum:

System Design Criteria:

Description of the system

Description of purpose

Systems and Controls Descriptions:

Equipment configurations

Sequence of operations

Integrated systems operations and interfaces

c) System and Controls Schematics

Operating Instructions:

equipment configurations,

operating parameters,

original operating software, latest version, any associated software

licences, and software keys

system level trouble shooting,

testing or inspection requirements,

corrective actions or recommendations

Installation Instructions: manufacturer's printed instructions describing manufacture's recommended installation procedures.

Operating Instructions: manufacturer's printed instructions describing proper operation.

Asset list and Equipment Identification: name plate information and other associated asset attributes for each piece of equipment. Barcode tags are to be added to all maintained/tracked assets and catalogued with asset information.

h) Maintenance Instructions: manufacturer's printed instructions describing manufacturers recommended maintenance tasks and frequency and manufacturers suggested lifecycle replacement timeframe.

i) Spare Part List: general parts lists and manufactures recommended critical spare parts, specific to the facility.

j) Testing Equipment and Special Tools: manufacturer's instructions on testing equipment or special tools required for operations, maintenance, or repairs.

k) Suppliers and Contractors List: list of contractors and suppliers who supplied and installed equipment, systems, materials of finishes, organized by Division and System. Includes company name, address, and contact information.

Tag Directories: directory identifying tag number and equipment description and location.

m) Drawing List: list of contract, as installed, drawings.

Shop Drawings: final reviewed shop drawings.

o) Product Data: manufacturer's product data for equipment, systems, materials, and finishes, including which specific products and options were used in the project.

p) Certifications: includes the following:

i) Copies of inspection, testing and commissioning reports prepared by authorities having jurisdiction.

ii) Certified copies of test reports prepared by independent testing agencies.

Any other certificates required by the PAA.

q) Warranties and Bonds: copy of manufacturer's warranties, extended warranties, maintenance bonds and service contracts.

9.16.12 BIM for Operations

The intent of this section is to outline items for important for Asset Management that will be required to be fully addressed under Schedule 7 – Design Management Plan. BIM will be used to support operations. Points to consider for this include:

Update BIM to reflect as-built condition for integration into CMMS and utilize BIM Authoring Software to generated as-built drawing

Utilizing BIM for asset data with a bi-directional interface with the CMMS

(Archibus)

.2 Participants are to work collaboratively within the development of Schedule 7, Design Management Plan to ensure successful BIM implementation including a level of development (LOD) that includes Level of Detail and Level of Information. suitable for facilities management and integration / interface with Owner database systems including the CMMS (Archibus) and:

Collaboratively establish information responsibilities aligned with ISO 19650 in regard to:

What assets matter and will be managed;

What level of information will be required;

iii) Who will be responsible for supplying data;

iv) Who will be responsible for managing the model/data at what stage;

Where the data is managed and stored;

Who owns it; and,

vii) Where and how data is found.

Ensure successful transfer and ongoing management of information/data for the operational phase of assets.

9.16.13 Training and Orientation

The intent of this section is to outline items for important for Asset Management that will be required to be fully addressed under Schedule 7 – Training and Orientation Plan. Effective transfer of responsibilities to Owner's operating staff at Substantial Completion (SC) must satisfy operator staff competency requirements for the safe operation, maintenance and repair of the new facility's system and assets. Effective knowledge transfer and utilising varying training opportunities and methods are imperative to satisfy this requirement, to minimise risk and to ensure the FMO and other Owner's operating staff have been provided with the appropriate training to accept responsibility for the facility at SC and to sustain the facility during the operating period.

Develop individual training modules for all equipment and systems for approval by the Commissioning Authority to include equipment/overall system Design strategy, equipment/system schematics, and physical hands-on training as necessary. Vendor provided training packages are to be included in these training modules.

.3 Develop a training plan with all identified module training activities aligned to the Design and construction schedule.

.4 Engage a qualified training facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between the Participant Design and construction team, trade subcontractor, Commissioning Authority and Owner for number of participants, instruction times, and location.

.5 Provide instruction at mutually agreed scheduled times in accordance with Schedule 7-Plan 9 giving sufficient advance notice of any changes to confirmed training activity.

Provide similar refresher instruction at the start of each season for equipment that requires seasonal operation where required.

.7 Training is expected to begin once Functional Performance Testing (as defined in Appendix 2H Commissioning) has been completed and validated. In addition, draft

Operation and Maintenance (O&M) manuals will be available for the given equipment/system/component/assembly.

.8 The following are recommended training topics for all sessions:

General purpose and Design of the system.

System and component troubleshooting.

Review of drawings and schematics.

Startup, normal & unoccupied operation, including normal operational testing of safety interlocks, systems, controls and switches i.e., high/low temp/pressure shut down/resets, shutdown, seasonal changeover, manual operation, control setup, programming troubleshooting, and alarms.

Health and safety issues.

Energy conserving operation and strategies.

g) Special warranty related items.

Question and answer period.

SCHEDULE 3
NOT USED

SCHEDULE 4
GOVERNANCE, LEADERSHIP AND MANAGEMENT

ALT membership and accountabilities

S4.1 The representatives of the Owner are:

(a) Westley Davidson;

(b) Brad Manderville; AND

(c) Alice Gelpke.

S4.2 The representatives of the NOPs are:

(a) EllisDon Corporation - Tim Smith;

(b) Parkin Architects Western Ltd. - Cameron Shantz.

S4.3 The IBC representative to attend at and participate in meetings of the ALT is Jeff Good.

S4.4 The BCIB representative to attend at and participate in meetings of the ALT is Johanna Navas.

ALT Meetings

S4.5 The Owner will convene the first ALT meeting and nominate one of the Owner's ALT representatives as an acting chair to manage the conduct of the first ALT meeting

S4.6 The ALT has determined that the following protocols will regulate the business of ALT meetings:

(a) there will be a secretariat appointed for the ALT;

(b) we will hold ALT meetings at times determined by the ALT;

(c) at the first ALT meeting, the ALT will agree on the appointment of the chair of the ALT and any protocol or procedure relating to the replacement of the chair of the ALT;

(d) the Participants agree that the ALT may delegate any general administrative function, including any part of its functions under Section 8 of this Agreement, to an Owner ALT representative;

(e) the ALT will agree a schedule of future ALT meetings on a three to six month forward schedule;

(f) whilst the ALT has a declared preference to meet in person, a representative may, provided adequate notice is provided to all ALT representatives, participate in an ALT meeting by video or telephone conference or another form of instantaneous electronic communication platform;

(g) an ALT representative may not attend an ALT meeting in the manner permitted under Section S4.6(f):

(i) if another ALT representative requests personal attendance; or

(ii) for two ALT meetings in succession without the consent of the chair of the ALT;

(h) the ALT meetings will be characterised by a commitment to a peer relationship amongst the ALT representatives where all participants have an equal say; and

(i) each ALT Representative will, prior to each ALT meeting, do all that they are reasonably able to do to ensure that they have the power to represent and bind their Participant at any ALT meeting in respect of any item of business on the ALT agenda.

ALT agenda

S4.7 The ALT agenda will be determined in accordance with the following requirements:

(a) the APM, after consultation with the AMT, will provide the ALT with the ALT agenda and discussion papers for any item on the ALT agenda no later than 10 Business Days prior to the ALT meeting or as otherwise agreed by the ALT. The ALT secretariat will immediately distribute the ALT agenda to all ALT representatives;

(b) a Participant may, within five Business Days of receipt of the ALT agenda, request the ALT secretariat to add a new item of business to the ALT agenda;

(c) the ALT secretariat will add the new item of business to the ALT agenda and immediately distribute the amended ALT agenda to all ALT representatives;

(d) the Participant proposing the new item of business will, no later than three Business Days prior to the next ALT meeting, provide the ALT secretariat with a discussion paper and any relevant information regarding the new item of business added to the ALT agenda; and

(e) the ALT secretariat will immediately provide the ALT members with any discussion paper or relevant information provided for any new item of business added to the ALT agenda.

Principles of ALT agenda

S4.8 The ALT agenda and discussion papers will be prepared on the principle that:

(a) early, open and honest communication with “no surprises” should be achieved; and

(b) an ALT representative will not be expected to unanimously agree on any material issue not set out in the ALT agenda.

ALT minutes

S4.9 The secretariat will attend all ALT meetings and prepare minutes to record all decisions and actions arising out of an ALT meeting. For the purposes of the first ALT meeting, the Owner will appoint a person to perform the secretarial functions.

S4.10 The secretariat will distribute the minutes of an ALT meeting within two Business Days. We will inform the secretariat within two Business Days of any objection we have to the minutes. Any objection to the minutes will be the first agenda item at the next ALT meeting.

APM and AMT

S4.11 The APM will be appointed by the ALT on a Best for Project basis. The AMT will be recommended by the APM and confirmed by the ALT to perform our obligations under this Agreement.

APM Responsibilities

S4.12 We agree that the:

(a) APM will report exclusively to the ALT;

(b) ALT will conduct periodic performance and development reviews of the APM's performance of its role in the Alliance; and

(c) the APM will comply with the APM Accountabilities and Responsibilities Matrix in Schedule 10.

Personal conflicts of interest

S4.13 We will ensure that each representative appointed to the AMT or the ALT will fully disclose any actual or potential personal conflict of interest he or she may have in respect of any action, decision or determination to be taken or made by the ALT or AMT (collectively referred to as "a personal conflict of interest"). We agree that a representative's employment by one of us, or directorship of or shareholding in one of us, by itself, will not amount to a personal conflict of interest.

S4.14 The ALT, in the absence of the relevant representative, will determine, adopting best corporate governance practices, whether the representative has a personal conflict of interest and the Best for Project solution to resolve it.

S4.15 Where a representative, on the grounds of a personal conflict of interest, is excluded from any discussion or determination arising out of or in connection with the acts, events or circumstances creating a personal conflict of interest, then any such discussion or determination cannot proceed at the:

(a) AMT until the person who is excluded on the ground of a personal conflict of interest excuses him or herself and is replaced by an appropriate person on a Best for Project basis; and

(b) ALT until the quorum required by Section 5.6 can be formed by representatives from each Participant not affected by the personal conflict of interest attending the ALT meeting.

S4.16 Each representative appointed to the AMT or the ALT from the NOPs will execute the conflict of interest declaration as set out in Schedule 12.

Corporate conflict of interest

S4.17 Each ALT representative will fully disclose any actual or potential conflict of interest of which that ALT representative is aware that the Participant it represents may have in respect of any action, decision or determination to be taken or made by the ALT.

S4.18 The ALT will consider the disclosure of the corporate conflict of interest and determine, adopting best corporate governance practices, on a Best for Project basis, the resolution of the conflict of interest.

SCHEDULE 5
COMPENSATION FRAMEWORK

Overview and General Provisions

S5.1 Overview of NOP compensation

(a) The compensation to each NOP for carrying out the Alliance Works will comprise three 'limbs' as summarised in **Table 1** below:

Limb 1 Reimbursable Costs	Reimbursement of actual direct costs and Project-specific overheads incurred in performing the Alliance Works (including mistakes, rework and wasted effort) determined in accordance with Sections S5.8 and S5.9
Limb 2 The Fee	A fee to cover profit and a contribution towards NOPs' non-Project-specific overheads, determined in accordance with Sections S5.10 to S5.12
Limb 3 Gainshare/Painshare	Payment of Gainshare by the Owner to the NOPs, or payment of Painshare by the NOPs to the Owner as the case may be, depending on how actual outcomes compare with pre-agreed targets in cost and non-cost performance areas, determined in accordance with Section S5.13 to S5.18

Table 1 – Overview of compensation to NOPs

S5.2 Application of GST

(a) All references to amounts and payments in this schedule are exclusive of GST and inclusive of PST. GST must be applied in accordance with Section 8.6.

S5.3 Payments subject to validation

(a) Prior to the execution of this Agreement the Financial Auditor conducted audits (the **Establishment Audits**) on the financial records of each of the NOPs to:

(i) clarify the basis for calculating Reimbursable Costs, and

(ii) establish a clear demarcation between what is intended to be a Reimbursable Cost and what is intended to be covered by the Limb 2 Fee and therefore not directly reimbursed.

(iii) All payments made are subject to audit or investigation pursuant to Sections 7.9 to 7.15. In attempting to resolve any issue between the Participants relating to compensation to the NOPs under this Agreement the ALT and the Financial Auditor will have regard to the requirements of this Schedule 5 and the principles and practices of reimbursement determined or established during the Establishment Audits orthose principles as amended by the ALT.

S5.4 Target Cost Estimate (TCE)

(a) The Project Proposal included a detailed build-up of the Target Cost Estimate (TCE). The Target Outturn Cost (TOC) is a figure extracted from the TCE. The amount of the TOC

prior to any changes arising from Adjustment Events (**Initial TOC**) along with a high-level summary of the make-up of the TOC are shown in Table 3 in **Appendix 1**.

Owner Alliance Costs

S5.5 Owner Alliance Costs are costs incurred directly by the Owner in relation to the Alliance Works (**Owner Alliance Costs**) other than payments made to a NOP in accordance with this Agreement. Owner Alliance Costs include costs incurred by the Owner in the following categories:

(a) provision of staff to the AMT and WPT;

(b) costs of procuring goods or services required to perform the Alliance Works;

(c) costs and expenses incurred by the Owner effecting and maintaining the insurances policies to be effected and maintained by the Owner in accordance with Schedule 13;

(d) costs associated with claims from third parties against the Owner arising out of the performance of the Alliance Works by the Participants to the extent that such costs are not covered by insurances in accordance with Section 14;

(e) other out-of-pocket expenses necessarily incurred by the Owner in performing or supporting the Alliance Works; and

(f) any other cost which is specified in this Agreement to be an Owner Alliance Cost or which the ALT agrees is an Owner Alliance Cost.

S5.6 Any funds received or receivable by the Owner in relation to the Alliance Works in the form of refunds, rebates, discounts, proceeds of insurance, third party settlements and the like will be credited in the reduction of Owner Alliance Costs to the extent that they are a reimbursement to the Owner of capital costs that are Owner Alliance Costs. For the purposes of this Agreement costs incurred by the Owner relating to the operations of the Alliance Works and provision of health services in and from the Alliance Works (**Opex**) are not Owner Alliance Costs, and where the Owner receives any Opex rebates in relation to the Project (such as payments from an energy utility provider in recognition of the energy efficiency achieved by the Project) such receipts will not be taken into account in calculating the AOC.

S5.6A The Participants acknowledge that:

(a) the Municipality of North Cowichan (**Municipality**) requires civil infrastructure works to be undertaken on, adjacent to or in the vicinity of the Site to support the development of the Cowichan District Hospital Project;

(b) the Municipality and the Owner will enter into an arrangement by which the Municipality (either by itself or by third parties on behalf of the Municipality) or the Owner agrees to undertake a portion of the civil infrastructure works;

(c) if the Municipality (either by itself or by third parties on behalf of the Municipality) agrees to undertake a portion of the civil infrastructure works, the Owner may be required to pay the Municipality an agreed proportion for the costs of the civil infrastructure works;

(d) if the Owner agrees to undertake the civil infrastructure works, then:

(i) to the extent that the Owner advises the Participant of the scope and extent of the civil infra-structure works prior to the Commencement Date, the civil infrastructure works will form part of the Alliance Works; or

(ii) to the extent that the Owner advises the Participant of the scope and extent of the civil infra-structure works after the Commencement Date, the civil infrastructure works will form an Adjustment Event; and

(iii) the Municipality will pay the Owner an agreed proportion for the costs of the civil infrastructure works.

S5.6B Notwithstanding Section S5.6 of this Schedule 5, the Participants acknowledge and agree that:

(a) any amount paid by the Owner to the Municipality in accordance with section S5.6A(c) will not be an Owner Alliance Costs; and

(b) any amount received by the Owner from the Municipality in accordance with section 5.6A(d)(iii), will not be credited in the reduction of Owner Alliance Costs or the Actual Outturn Costs (as the case may be).

S5.7 If it is not clear whether an item is an Owner Alliance Cost, an assessment will be made by the Financial Auditor based on interpretation of this Agreement (including this Schedule 5) and the Establishment Audits, having regard to the principles mentioned in Section S5.5. If a Participant does not agree with the Financial Auditor's assessment the matter shall be referred to the ALT for a determination.

Limb 1 – Reimbursable Costs (RCs)

S5.8 Reimbursable Costs - overview

(a) Reimbursable Costs are costs that are wholly and specifically incurred by the NOPs in performing the Alliance Works and which have been approved by the Alliance Project Manager in line with policies approved by the ALT. Reimbursable Costs will be determined based on the following principles:

(i) a NOP will not receive any contribution to its non-Project-specific or corporate overhead costs or expenses or derive any profit or unreasonable advantage from the utilisation of its people, plant, equipment or resources;

(ii) a NOP cannot recover anything that is not a bona-fide specific cost or expense incurred by it in performing the Alliance Works. A NOP can only recover a maximum of 100% of any bona-fide specific cost or expense incurred by it. There must not be any duplicate recovery of any cost or expense or allowance for cost or expense (i.e. no double dipping);

(iii) where a NOP receives payments (refunds, rebates, discounts, proceeds of insurance, third party settlements and the like) arising from its performance of Alliance Works (other than payments received from the Owner for Limb 2 Fee and Limb 3 Gainshare) such payments will be taken to account as a reduction of Reimbursable Costs;

(iv) Reimbursable Costs must not include any contribution to the NOP's profit or recovery of its corporate overhead costs/expenses; and

(v) costs and expenses associated with off-site administrative or functional support not directly involved in the performance of the Alliance Works and under the immediate control/direction of the Alliance Project Manager will not be Reimbursable Costs unless stated otherwise in this Agreement or otherwise approved by the ALT.

(b) In determining the quantum of a Reimbursable Cost, the below items shall be included:

(i) all cash, trade and other discounts, allowances and credits received by, or payable to, a NOP arising out of or associated with the performance of the Alliance Works shall be treated as a deduction from Reimbursable Costs;

(ii) statutory liabilities such as accrued entitlement to annual leave, public holidays, sick leave etc. for employees will be Reimbursable Costs, but only to the extent that such liabilities are likely (based on historical evidence) to be eventually paid out by the NOP; and

(iii) statutory taxes (excluding GST) duties and rebates, including customs duty and sales tax payable by a NOP will be treated as Reimbursable Costs.

(c) Where unfixed materials, minor plant and the like are treated as a Reimbursable Cost and held by the Alliance on behalf of the Owner become excess to what is required to complete the Alliance Works, the Alliance Project Manager will arrange for their sale at fair market value, the proceeds of such sale will accrue to the Owner and be deducted from the Actual Outturn Cost.

(d) If it is not clear whether an item is a Reimbursable Cost, an assessment will be made by the Financial Auditor based on interpretation of this Agreement (including this Schedule 5) and the Establishment Audits, having regard to the principles mentioned in Section S5.3 and S5.8. If a Participant does not agree with the Financial Auditor's assessment the matter shall be referred to the ALT for a determination.

S5.9 Reimbursable Costs - details

(a) The table in **Appendix 2** identifies which categories of cost will be Reimbursable Costs, any category-specific conditions, and details of how each category will be treated for the purposes of Limb 1. Where category-specific conditions identified in **Appendix 2** are not precisely consistent with the principles mentioned in Section S5.3 and S5.8, in the absence of manifest error **Appendix 2** will prevail to the extent of such category-specific inconsistencies. Regardless of whether a cost is incurred in connection with the Alliance Works, unless the item is stated to be a Reimbursable Cost in **Appendix 2**, or is expressly stated to be a Reimbursable Cost elsewhere in this Agreement, the item will be deemed to be covered by the Limb 2 Fee and will not be a Reimbursable Cost.

(b) The tables in Appendix 3 and Appendix 4 set out details in respect of Reimbursable Cost recovery parameters that are specific to each NOP. If information in those appendices is in conflict with information in **Appendix 2**, Appendix 3 and Appendix 4 will prevail to the extent of that inconsistency.

Limb 2 - Fee

S5.10 The Fee - general

(a) The Fee payable to a NOP determined under Section S5.11 will be deemed to fully compensate that NOP for

(i) all direct and indirect expenditure by that NOP associated with the performance of Alliance Works and the fulfilment of its obligations under this Agreement;

(ii) an appropriate contribution towards the costs and expense of its corporate overhead structure; and

(iii) profit,

not otherwise covered as a Limb 1 Reimbursable Costs or Limb 3 Gainshare/Painshare mechanism.

S5.11 Fees for NOP1 and NOP2

(a) The Fee payable to NOP1 (Fee_{NOP1}) will be calculated as follows:

- **Fee_{NOP1} = RC_{NOP1} x $Fee\%_{NOP1}$**, where:

RC_{NOP1} = the total amount of Reimbursable Costs payable to NOP1; and

$Fee\%_{NOP1}$ = the NOP1 mark-up percentage stated in Appendix 1.

(b) The Fee payable to NOP2 (Fee_{NOP2}) will be calculated as follows:

- **Fee_{NOP2} = RC_{NOP2} x $Fee\%_{NOP2}$**, where:

RC_{NOP2} = the total amount of Reimbursable Costs payable to NOP2; and

$Fee\%_{NOP2}$ = the NOP2 mark-up percentage stated in Appendix 1.

S5.12 Not Used

Limb 3 – Gainshare/Painshare

S5.13 Overview of Gainshare/Painshare

(a) The Gainshare/Painshare regime will comprise two components as set out in Table 2 below. Each component is explained in detail further below.

1) TOC underrun / overrun	A sharing of cost underrun or overrun determined in accordance with Section S5.15 by comparing the Actual Outturn Cost (**AOC**) with the final TOC

2)	Performance in key result areas (KRAs)	KRA-related Gainshare/Painshare payments determined in accordance with Section S5.17 to incentivise performance against targets (other than TOC) that the Owner regards as being of significant value to the Owner and the Project

Table 2 - Gainshare/Painshare components

(b) **Appendix 7** contains charts and worked examples to illustrate the operation of the Gainshare/Painshare regime. All charts and examples assume there are no Adjustments Events – i.e. the final TOC is identical to the Initial TOC.

S5.14 NOP downside risk cap

(a) Notwithstanding how poor the actual outcomes are or what figures are derived by the application of the various formulae set out in Sections S5.15 to S5.18, the maximum Painshare payable by each NOP ($Pain_{Max}$) will be a sum equal to the Fee paid/payable to the NOP under this Agreement pursuant to Section S5.11.

S5.15 TOC underrun / overrun

(a) Subject to Section S5.14(a), where the AOC determined in accordance with Section S5.22 exceeds the final TOC determined in accordance with Section S5.20(e), the overrun will be shared between the Owner and the NOPs collectively in the proportions stated in **Appendix 1**.

(b) Where the AOC determined in accordance with Section S5.22 is less than the final TOC determined in accordance with Section S5.20(e) the underrun will be distributed in the proportions stated in **Appendix 1** between the Owner, the NOPs collectively, and a portion to top-up the funds available to pay for KRA-related Gainshare ($OKS_{Top\text{-}up}$).

S5.16 KRA-related Gainshare/Painshare

(a) The KRA Measurement Framework (one of the plans within the Alliance Management System) sets out the details of the methods and procedures that will be used to measure performance in various key result areas (KRAs).

(b) Pursuant to the KRA Measurement Framework:

(i) A KRA score between the limits of -100 and +100 will be determined for each KRA using the KPI parameters stated in Appendix 1. Each KRA score reflects actual performance in respect of that KRA across the following spectrum:

a) Minus 100, indicating very poor Alliance performance for which maximum KRA-related Painshare will be payable;

b) Zero, representing an outcome and Alliance performance in line with the agreed minimum conditions of satisfaction (MCOS) target for which there will be no KRA-related Gainshare/Painshare; and

c) Plus 100, indicating outstanding Alliance performance for which maximum KRA-related Gainshare will be payable.

(ii) An overall KRA performance score (OKS) between the limits of -100 and +100 will be calculated as the weighted aggregate of the KRA scores, using the KRA weightings stated in Appendix 1.

S5.17 KRA-related Gainshare/Painshare payments

(a) Where the value of OKS determined in accordance with Section S5.16(b) is greater than zero, the NOPs collectively will be entitled to an OKS Gainshare amount ($Gain_{OKS}$) calculated as follows:

➢ $$\mathbf{Gain_{OKS}} = \frac{\mathbf{OKS}}{\mathbf{100}} \mathbf{x\ (OKS_{Seed} + OKS_{Top\text{-}up})}$$ where:

OKS = the value determined in accordance with Section S5.16(b); and

OKS_{Seed} = the amount stated in Appendix 1; and

$OKS_{Top\text{-}up}$ = a portion of cost underruns, if any, determined in accordance with Section S5.15(b)

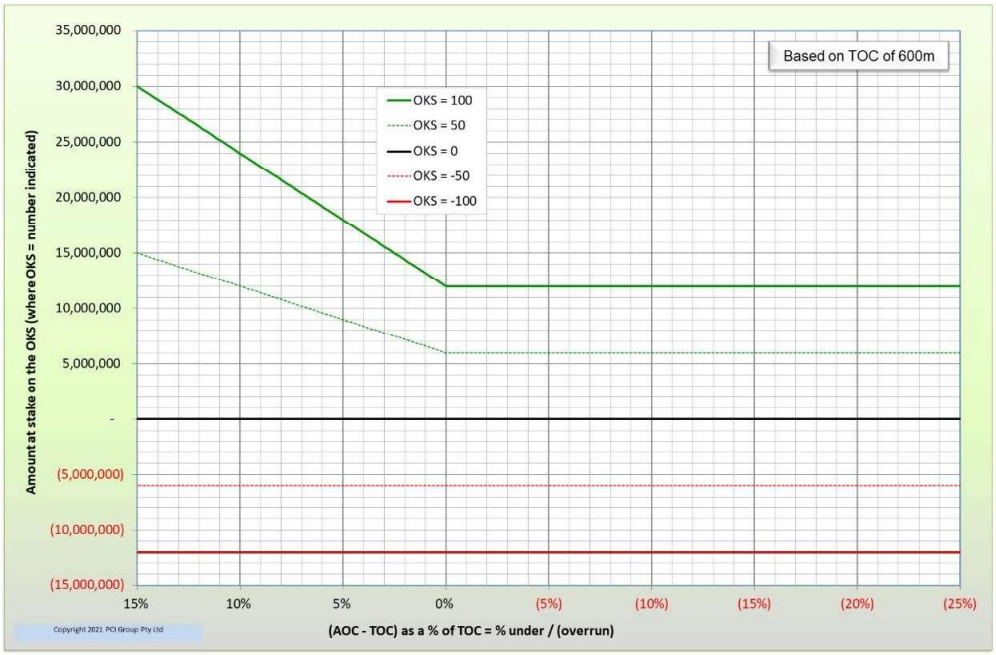
(b) Subject to Section S5.14(a), if OKS is less than zero the NOPs collectively will be obliged to pay the Owner an OKS Painshare amount ($Pain_{OKS}$) calculated as follows:

➢ $$\mathbf{Pain_{OKS}} = \frac{\mathbf{OKS}}{\mathbf{-100}} \mathbf{x\ MaxPain_{OKS}}$$, where:

OKS has the same meaning as in Section S5.16(b); and

$MaxPain_{OKS}$ = the amount stated in **Appendix 1**.

(c) The following chart, based on a hypothetical Initial TOC of $600m, illustrates how the amount at stake for the NOPs related to OKS (Y-axis) varies with the extent of cost underrun/overrun (X-axis) – specifically, the potential KRA-related Painshare remains fixed whereas the potential KRA-related Gainshare increases with increasing cost underrun due to $OKS_{Top\text{-}up}$.



S5.18 Sharing of gain or pain amongst NOPs

(a) Any amounts the Owner has to pay to the NOPs collectively (Gainshare) under Sections S5.13 to S5.17 will be distributed amongst the NOPs in the proportions stated in **Appendix 1**.

(b) Any amounts the NOPs collectively have to pay to Owner (Painshare) under Sections S5.13 to S5.17 will be paid by the respective NOPs in the proportions stated in **Appendix 1**.

Impact of Adjustment Events

S5.19 Adjustment to performance targets

(a) For each Adjustment Event (AE) that it approves pursuant to Section 12 the ALT will determine adjustments to targets impacting Limb 3 in accordance with Sections S5.19 to S5.21 such that Gainshare/Painshare is not materially affected by the Adjustment Event – i.e. the position in respect of Gainshare/Painshare remains as it would have been if the Adjustment Event had not occurred.

S5.20 Adjustment to TOC including Limb 2 Fees

(a) For each Adjustment Event the ALT will determine what adjustment (up, down or nil) will be made in respect of Owner Alliance Costs (OACs) and/or Reimbursable Costs (RCs) arising from the Adjustment Event ($AE_{\Delta\text{-}L1}$) based on an estimate of the impact of the Adjustment Event on the Alliance Works. The estimate must be based on the same estimating principles that were used to develop the TCE. Where Monte Carlo analysis is used to model uncertainties in the estimate, $AE_{\Delta\text{-}L1}$ will be the point that matches a probability of 50% (the P50 point) on the cost probability distribution curve. Where possible, additional work arising from an Adjustment Event will only be carried out after

$AE_{\Delta\text{-}L1}$ has been determined by the ALT. Where additional costs arising from an Adjustment Event are incurred before $AE_{\Delta\text{-}L1}$ has been determined, those costs will be included in the estimate as known actual costs.

(b) The estimate will include a breakdown into the various elements necessary to enable adjustments to Limb 2 Fees to be calculated in accordance with Section S5.20(d).

(c) A Participant or the ALT may require a third-party estimator appointed in accordance with Section 7.1.3 to confirm that $AE_{\Delta\text{-}L1}$ conforms with the requirements of this Agreement and is a reasonable estimate of the likely additional or reduced costs arising as a result of the Adjustment Event, the allowances for risk and opportunity within $AE_{\Delta\text{-}L1}$ are reasonable and $AE_{\Delta\text{-}L1}$ represents value for money (VFM) for the Owner.

(d) The TOC will be adjusted (up or down) for each Adjustment Event ($AE_{\Delta\text{-}TOC}$) using the following formula:

- **$AE_{\Delta\text{-}TOC}$ = $AE_{\Delta\text{-}L1}$ + $AE_{\Delta\text{-}L2}$** where:

  $AE_{\Delta\text{-}L1}$ = The sum of estimated adjustments to OACs and RCs determined in accordance with Section S5.20(a); and

  $AE_{\Delta\text{-}L2}$ = the sum of the estimated additional Fee for each NOP associated with the Adjustment Event calculated by applying the applicable formulae in Section S5.11 to their respective RC amounts within $AE_{\Delta\text{-}L1}$.

(e) The final TOC for the purposes of determining cost-related Gainshare or Painshare in accordance with Section S5.15 will be calculated as:

- **Initial TOC + $\Sigma AE_{\Delta\text{-}TOC}$** where:

  Initial TOC = the amount stated in **Appendix 1**; and

  $\Sigma AE_{\Delta\text{-}TOC}$ = the cumulative total for all Adjustment Events of $AE_{\Delta\text{-}TOC}$ determined in accordance with Section S5.20(d) for each Adjustment Event.

S5.21 Adjustment to KRA performance targets

(a) For each Adjustment Event the ALT will determine the adjustment, if any, to each of the KRA-related performance targets having regard to the principle mentioned in Section S5.19(a).

Actual Outturn Cost (AOC)

S5.22 Calculation of AOC

(a) The Actual Outturn Cost (AOC) will be determined as follows:

- **ΣRC + ΣOAC + ΣFee - Σ$in**, where:

ΣRC = The total aggregate amount of actual Limb 1 Reimbursable Costs paid/payable under this Agreement across all NOPs;

ΣOAC = The total aggregate amount of Owner Alliance Costs (OACs) incurred under this Agreement;

ΣFee = The total aggregate Limb 2 Fee paid/payable to the NOPs under this Agreement pursuant to Section S5.11; and

Σ$in = The net income receivable by any of the Participants from the following sources:

a) proceeds of an insurance policy under Section 14;

b) recovery from claims against 3rd parties to the extent that, subject to Section S5.6, S5.6A and S5.6B, such claims relate to costs that have been treated as Owner Alliance Costs or NOP Reimbursable Costs under this Agreement.

c) disposal of items or other adjustments pursuant to Sections S5.8(b) and S5.8(c).

Quantum of Payments

S5.23 Overriding principle of cash neutrality

(a) Notwithstanding the various formulae set out below in Sections S5.24 to S5.27, the amounts allowed for accruals within each progress claim/payment will be adjusted to ensure that the NOPs remain so far as is reasonably practicable approximately 'cash neutral' (other than impacts of the Builders Lien Act) in respect of Reimbursable Cost expenditure and reimbursement (including recognition of any interest incurred or earned), as determined by the Financial Auditor.

S5.24 Progress payments

(i) Except as provided in Sections S5.26 and S5.27 and subject to Section S5.25, progress payments pursuant to Section 8.2 will comprise amounts for each NOP calculated as follows:

- **$[(RC_{TD} + Fee_{TD} – HB_{TD}) – \Sigma Paid]$**, where:

RC_{TD} = Reimbursable Costs up to the cut-off date for the invoice, based on the Reimbursable Costs of items which have already been invoiced to and/or paid by that NOP;

Fee_{TD} = A payment calculated by applying the applicable Fee%(s) in accordance with Section S5.11 to that NOP's Reimbursable Costs to date;

HB_{TD} = Total amount of holdbacks to date as required by the BLA, including any holdback amount which has been or should be released due to substantial performance of any part of the Alliance Works; and

$\Sigma Paid$ = The total amount (excluding GST) previously paid to that NOP up to that time under this Agreement.

S5.25 Interim Limb 3 payments

(a) We are committed to avoiding a situation arising at any time where a Painshare amount payable by a NOP to the Owner exceeds the aggregate of the Limb 1 and Limb 2 amounts that remain payable by the Owner to that NOP.

(b) If it becomes likely at any stage that the situation contemplated in Section S5.25(a) could arise, the ALT will take all steps reasonably necessary to give effect to Section S5.25(a), which may include a direction that:

(i) an interim payment of Painshare be included in monthly progress payments; and/or

(ii) security, in a form acceptable to the Owner, be provided by the relevant NOPs.

(c) The ALT may at any time direct that an interim payment of Limb 3 be made, but in doing so must:

(i) be satisfied that the consistent trend of Alliance performance and current forecast cost to complete the Alliance Works support the interim Limb 3 payment;

(ii) act consistently with Sections S5.25(a) and S5.25(b), and with conservative accounting principles and practices; and

(iii) minimise unnecessary volatility in payments under this Agreement.

(d) We acknowledge that any interim Limb 3 payments will be subject to the BLA.

S5.26 Following Substantial Completion Date

(a) As soon as practical and no more than 40 Business Days after the Substantial Completion Date, the following amounts will be payable to each NOP:

- **[(RC_{TD} + Fee_{TD} + G/P_{Prov}) – ΣPaid]**, where

$RC_{TD,}$ and Fee_{TD} have the same meaning as in Section S5.24(i);

G/P_{Prov} = A provisional estimate of the net amount of Gainshare or Painshare payable to or by that NOP as determined by the ALT in accordance with Section S5.25 and having made a reasonable allowance for the cost of attending to defects up to the expiry of the relevant Defects Correction Period; and

ΣPaid = The total amount previously paid (excluding GST) to that NOP up to that time under this Agreement.

S5.27 Final Payment

(a) As soon as practical and no more than 60 Business Days after the Final Completion Date, the Financial Auditor will complete and finalize all investigations in accordance with Section S5.3 and the following amounts will be payable to each NOP:

- **[(RC + Fee + G/P) – ΣPaid]**, where:

RC = Total actual Reimbursable Costs payable to that NOP pursuant to Section Sections S5.8 to S5.9 (accruals are not acceptable);

Fee = The Fee payable to that NOP pursuant to Section S5.11;

G/P = The Gainshare/Painshare payable to or by that NOP as determined by the ALT pursuant to Sections S5.13 to S5.18; and

ΣPaid = The total amount (excluding GST) previously paid to that NOP up to that time under this Agreement.

Appendix 1 - Compensation Particulars

Ref	Particulars
S5.4	The TOC is the amount shown in cell S18 in Table 3[1] immediately below.

	D	E	F	G	J	K	N	O	P	S
1		Owner		Builder NOP		Architect NOP		Σ all NOPs		Owner + NOPs Total
2		VIHA		EllisDon		Parkin				
3	*Limb 2 Fee mark-up % on*									
4	*Limb 2 Fee mark-up % on Other-than-*									
5	OACs / Limb 1 RCs (excl. consultant OTS									
6	Consultant OTS Limb 1 RCs									
7	Total OACs / RCs excluding Construction R&O									
8	Construction R&O provisions									
14	Total (estimated) OACs + Limb 1 RCs									
15	Limb 2 Fee $ on Limb 1 RCs (excl. OTS)									
16	Limb 2 Fee $ on consultant OTS Limb 1 RCs									
17	Total Limb 2 Fee $									
18	**TOC** = OACs + Limb 1 RCs + Limb 2 Fee	49,203,149.00		1,102,036,730.14		14,479,640.17		1,116,516,370		1,165,719,519

Table 3 – Summary of the build-up of the TOC

S5.11	Fee%$_{NOP1}$		
	Fee%$_{NOP2}$ on employee Staff Reimbursable Costs		
	Fee%$_{NOP2}$ on any other Reimbursable Cost (e.g. consultants, out of pocket costs, IT costs etc)		
Not Used	Not Used		Not Used
	Not Used		Not Used
S5.15(a)	Sharing of cost overruns between Owner and NOPs	Owner	50%
		NOPs (collectively)	50%
S5.15(b)	Sharing of cost underruns between Owner, NOPs and OKS$_{Top-up}$	Owner	40%
		NOPs (collectively)	40%
		OKS$_{Top-up}$	20%
S5.16(b)	KRA weightings	KRA1: Substantial Completion and Substantial Commissioning	20%
		KRA2: Key User Satisfaction	15%
		KRA3: Design Elements Outcomes	15%
		KRA4: Facility Maintenance and Environmental Sustainability	15%
		KRA5: Community Benefits	20%
		KRA6: Health of Alliance	15%

[1] **[NOPs to Note – this table 3 has been replaced with a new Table 3 to reflect the current TCE as instructed by the Owner.]**

Ref	Particulars					
S5.16(b)	**Essential KPI parameters**					
		Summary KPI definition	**KPI weight within KRA**	**Performance for KPI score of:**		
				Minus 100	**Nil (MCOS)**	**Plus 100**
	KRA1 (20%)	**Substantial Completion** • KPI 1.1 - Achieve Substantial Completion by the Target Substantial Completion Date				
		Substantial Commissioning • KPI 1.2 - Achieve Substantial Commissioning by the Target Substantial Commissioning date				
	KRA2 (15%)	**Key User Satisfaction** • KPI 2.1 - Clinical and patient stakeholders feel that they were adequately engaged through design and construction				
		• KPI 2.2 - First Nation, Metis, and Indigenous people feel that they were adequately engaged through the design and construction of indigenous related objectives.				
	KRA3 (15%)	**Design Elements Outcomes** • KPI 3.1 - Achievement of design Element Outcomes				
	KRA4 (15%)	**Facility Maintenance and Environmental Sustainability Outcomes**				
		• KPI 4.1 - Maintenance and lifecycle cost				

[2] Note – the Baseline Maintenance and Lifecycle Cost for the purposes of KPI 4.1 will be as prepared in accordance with Schedule 2, Appendix 2P-1, recommended by ALT to Owner 6 months before Target Substantial Completion Date and as accepted by the Owner.

Ref	Particulars		
		• KPI 4.2 - Environmental Sustainability – Operational Energy Use Intensity	
		• KPI 4.3 - Environmental Sustainability – Operational Greenhouse Gas Emissions	
		• KPI 4.4 - Environmental Sustainability – Embodied Greenhouse Gas Emissions	
	KRA5 (20%)	**Community Benefit** • KPI 5.1 - Forecast	
		• KPI 5.2– Diverse Workforce	
		• KPI 5.3 – Underrepresented Equity Groups	
		• KPI 5.4 – Local Residents	
		• KPI 5.5 – Apprentices/Trainees	
	KRA6 (15%)	**Health of Alliance**	
		• KPI 6.1 - Fulfillment of a High-Performing Collaborative Alliance.	
		• KPI 6.2 - Fulfillment of a positive safety culture	
		• KPI 6.3 - Fulfillment of a Culturally Safe and Respectful Work Environment	
S5.17(a)	OKS_{Seed}		2.0% x TOC
S5.17(b)	$MaxPain_{OKS}$		2.0% x TOC
S5.18(a)	Gainshare will be distributed amongst the NOPs:		In proportion to the total Limb 2 Fee payable to each NOP

Ref	Particulars	
S5.18(b)	Painshare will be distributed amongst the NOPs:	In proportion to the total Limb 2 Fee payable to each NOP

Appendix 2 – Reimbursable Costs – general guidelines (all NOPs)

Table 4 – Reimbursable Costs – general (all NOPs)

No.	Item	RC?	Treatment
1	BCIB Invoices	Yes	Expenses invoiced to a NOP by BCIB in accordance with the BCIB-Contractor Agreement shall be considered Reimbursable Costs.
The remaining reimbursable items in this table relate to non-BCIB supplied labour and expenses.			
2	Wages and salary costs	Yes	Total fixed remuneration (**TFR**) for full and part time Project staff, based on actual costs paid to employees (as validated by the Financial Auditor), plus employment related overhead (**ERO**) to cover accrued employment liabilities. NOP1 will charge staff TFR at a flat weekly rate that is based on the actual annual TFR paid to each staff member divided by 52 weeks, which calculation will account for any paid time off (e.g. vacations, statutory holidays and sick leave etc). A detailed breakdown of staff TFR will be provided by NOP1 with each monthly progress payment report submitted in accordance with Section 8.2. NOP2 - Project staff means any member of the NOP team that has a direct role in performing the Alliance Works as evidenced by timesheets or the like. A detailed breakdown of staff TFR will be provided by NOP2 with each monthly progress payment report submitted in accordance with section 8.2. NOP1 and NOP2 - For wages personnel, the actual direct labour costs incurred by a NOP will be calculated in accordance with the relevant collective agreement or employment agreement, as validated by the Financial Auditor, and any relevant policies approved by the ALT. Treatment of each ERO element is summarised below. Details on how TFR and ERO are calculated for each NOP are summarised in Appendix 3 for NOP1 and Appendix 4 for NOP2.
3	Annual leave	Refer to Treatment	NOP1 - No NOP2 - Based on employee's annual leave entitlement as set out in their individual employment contract or letter of offer, or as otherwise as may be validated by the Financial Auditor to the Owner's satisfaction, acting reasonably.

No.	Item	RC?	Treatment
4	Employee health and Medical Benefits	Yes	NOP1- refer to Appendix 3 NOP2 – refer to Appendix 4
5	Public / statutory holidays	Yes	NOP1 – No NOP2 – Capped at the number of days gazetted as statutory holidays in British Columbia. For details refer to Appendix 4 for NOP2.
6	WorkSafe BC Premiums	Yes	Based on the prevailing premium rates as prescribed by WorkSafe BC, or each equivalent jurisdictional entity, insurer or regulator (as the case may be) as validated by the Financial Auditor. For details refer to Appendix 3 for NOP1 and Appendix 4 for NOP2.
7	Canada Pension Plan and Employment Insurance Contributions	Yes	Based on employee's actual statutory entitlement (employer contribution). For details refer to Appendix 3 for NOP1 and Appendix 4 for NOP2.
8	Salaried staff overtime	Depends	NOP1 – No ERO on any overtime amount payable to a NOP1 staff member NOP2 – No ERO on any overtime amount payable to a NOP2 staff member. Overtime will not be a Reimbursable Cost except as recommended by the APM and approved by the ALT, on the basis outlined in Appendix 3 for NOP1 and Appendix 4 for NOP2. The ALT must be satisfied that overtime payable to the nominated staff member is proper and reasonable and is consistent with standard operating procedure for the NOP.
9	Redundancy or severance pay (wages personnel)	Depends	Redundancy or severance payments to wages personnel will not be a Reimbursable Cost except where severance pay entitlement is included in a project-specific collective agreement on terms specifically approved by the ALT prior to their inclusion.

No.	Item	RC?	Treatment
10	Redundancy or severance pay (non-wages personnel)	Refer to Treatment	NOP1 - Redundancy or severance payments to non-wages personnel will only be a Reimbursable Cost where a person was: • Specifically hired for the Alliance Works as evidenced by the relevant employment contract (as validated by the Financial Auditor); • The need for the role was outlined in the Project Proposal accepted by the Owner; and • Approved by the ALT. NOP2 - Redundancy or severance payments to non-wages personnel will not be a Reimbursable Cost.
11	Health checks and pre-existing medical conditions	Depends	Where a NOP is obliged to pay for health checks under the relevant collective agreement or employment agreement, such costs actually incurred will be Reimbursable Costs. Costs of new employee health assessment or other or periodic health checks (including drug and alcohol testing) required under a OHS policy approved by the ALT will be Reimbursable Costs. Otherwise, the costs of health checks including costs associated with pre-existing medical conditions will not be Reimbursable Costs.

No.	Item	RC?	Treatment
12	Salary increases	Depends	Costs associated with increases in salary for non-wages personnel will only be Reimbursable Costs to the extent that such increases have been expressly and specially approved by the ALT. Annually, at the commencement of the financial year at a time determined by the ALT, the Financial Auditor will review the *"forecast"* aggregate annual escalation of Reimbursable Costs of non-wages personnel performing Alliance Works and prepare a report to the ALT of any under-run or over-run (as the case may be) against the relevant allowance within the TCE. The purpose of the report is to assist the ALT determine the funding allocation from within the TCE of any material over-run. Annually, at the conclusion of the financial year, at a time determined by the ALT, the Financial Auditor will audit the *"actual"* aggregate escalation of Reimbursable Costs of non-wages personnel performing Alliance Works for the concluded financial year and update report referred to earlier in this Item 12. Where the ALT approves an increase in salary, a new cost rate for that person is to be determined in consultation with the Financial Auditor using the same methodology that was used by the Financial Auditor to establish the staff rates in the Establishment Audits. If at any time a NOP considers that a pre-agreed staff rate no longer accurately reflects the actual cost of providing that person, it may ask the ALT to direct that the rate be revised. The rate shall remain unchanged unless the ALT directs otherwise.
13	Increases in employee's employment entitlements	Depends	Costs associated with increases in an employee's employment entitlements will only be Reimbursable Costs to the extent that such increases have been specifically approved by the ALT.

No.	Item	RC?	Treatment

14	Bonuses	Refer to Treatment	NOP1 and NOP2 - NOP specific employee bonuses associated with NOP corporate performance and project performance are not a Reimbursable Cost.
			
			NOP1 and NOP2 - Alliance specific employee related bonus entitlements (e.g. recruitment or sign-on to the project bonuses) will only be a Reimbursable Cost, where such entitlement is:
			
			• evidenced by each relevant employment contract (as validated by the Financial Auditor);
			• either:
			  ○ outlined in the Project Proposal accepted by the Owner; or
			  ○ in accordance with specific policies, procedures or protocols (as the case may be) recommended by the ALT and endorsed by the Owner (acting reasonably), in advance of any amount being incurred, recommended or determined; and
			• as approved by the ALT, including with respect to funding (from an allowance in the TOC or otherwise from a contingency allowance within the TOC or from an under-run against the TOC) prior to the relevant amount being paid or reimbursed (as the case may be).

No.	Item	RC?	Treatment

15	Recruitment	Refer to Treatment	Costs associated with recruitment, mobilisation and screening of personnel hired specifically for the Alliance Works including verification of competencies and associated project -specific human resource management activities will be Reimbursable Costs, where such entitlement is:
			• evidenced by each relevant employment contract (as validated by the Financial Auditor);
			• either:
			  ○ outlined in the Project Proposal accepted by the Owner; or
			  ○ in accordance with specific policies, procedures or protocols (as the case may be) recommended by the ALT and endorsed by the Owner (acting reasonably), in advance of any amount being incurred, recommended or determined; and
			• as approved by the ALT, including with respect to funding (from an allowance in the TOC or otherwise from a contingency allowance within the TOC or from an under-run against the TOC) prior to the relevant amount being paid or reimbursed (as the case may be); and
			• as approved by the ALT,
			subject to a pro-rata clawback if the relevant individual is removed from the Project by the NOP within 12 months of commencement, but not if the individual leaves the NOP organisation.

No.	Item	RC?	Treatment

16	Relocation costs	Depends	Relocation costs will only be Reimbursable Costs where such entitlement is:
			• evidenced by each relevant employment contract (as validated by the Financial Auditor);
			• either:
			  ○ outlined in the Project Proposal accepted by the Owner; or
			  ○ in accordance with specific policies, procedures or protocols (as the case may be) recommended by the ALT and endorsed by the Owner (acting reasonably), in advance of any amount being incurred, recommended or determined; and
			• as approved by the ALT, including with respect to funding (from an allowance in the TOC or otherwise from a contingency allowance within the TOC or from an under-run against the TOC) prior to the relevant amount being paid or reimbursed (as the case may be),
			subject to a pro-rata clawback if the relevant individual is removed from the Project by the NOP within 12 months of commencement, but not if the individual leaves the NOP organisation.

17	Personnel travel and accommodation	Depends	Costs associated with personnel travel and accommodation will only be Reimbursable Costs where they have been recommended by the APM and are consistent with Provincial Travel Guidelines, or in accordance with specific policies, procedures or protocols (as the case may be) recommended by the ALT and endorsed by the Owner (acting reasonably), in advance of any amount being incurred, recommended or determined.

No.	Item	RC?	Treatment

18	Project allowances	Depends	Costs incurred in respect of Project allowances for wages personnel paid in accordance with the relevant collective agreement or employment agreement will be Reimbursable Costs.
			
			Any other costs incurred in respect of Project allowances will only be Reimbursable Costs where such entitlement is:
			• evidenced by each relevant employment contract (as validated by the Financial Auditor);
			• either:
			  ○ outlined in the Project Proposal accepted by the Owner; or
			  ○ in accordance with specific policies, procedures or protocols (as the case may be) recommended by the ALT and endorsed by the Owner (acting reasonably), in advance of any amount being incurred, recommended or determined; and
			• as approved by the ALT, including with respect to funding (from an allowance in the TOC or otherwise from a contingency allowance within the TOC or from an under-run against the TOC) prior to the relevant amount being paid or reimbursed (as the case may be); and
			• as approved by the ALT.

No.	Item	RC?	Treatment
19	Living away from home allowances (LAHA)	Depends	Costs incurred in respect of LAHA allowances for wages personnel paid in accordance with the relevant collective agreement or employment agreements which were in existence prior to the effective date of this Agreement will be Reimbursable Costs. Any other costs incurred in respect of LAHA allowances will only be Reimbursable Costs where such entitlement is: • evidenced by each relevant employment contract (as validated by the Financial Auditor); • either: ○ outlined in the Project Proposal accepted by the Owner; or ○ in accordance with specific policies, procedures or protocols (as the case may be) recommended by the ALT and endorsed by the Owner (acting reasonably), in advance of any amount being incurred, recommended or determined; and • as approved by the ALT, including with respect to funding (from an allowance in the TOC or otherwise from a contingency allowance within the TOC or from an under-run against the TOC) prior to the relevant amount being paid or reimbursed (as the case may be); and • as approved by the ALT.
20	Project training	Yes	Alliance-specific training conducted in accordance with an ALT approved Alliance Training Plan and site inductions approved by the ALT will be a Reimbursable Cost.
21	Alliance health-checks and coaching.	Yes	The costs of conducting Alliance 'health checks' and coaching of the Alliance team (including the ALT) will be a Reimbursable Cost.
22	Corporate training	No	Non-Project-specific training will not be a Reimbursable Cost.
23	Industrial relations	Depends	Costs associated with negotiation of collective agreements will not be Reimbursable Costs, except where they are specific to the Alliance and specifically approved by the ALT prior to being incurred.

No.	Item	RC?	Treatment
24	Off-site administration costs	No	Off-site administration costs (payroll, accounts payable, internal audits including OHS or environmental audits, HR / IR advice, project risk reviews and the like) will not be Reimbursable Costs, notwithstanding that it may be normal practice for a NOP to levy a charge against projects to recoup such costs.
25	ALT time inputs on ALT duties	No	Costs associated with time spent by ALT members fulfilling the role and duties of a ALT member will not be Reimbursable Costs.
	ALT out-of-pocket expenses	No	Out-of-pocket expenses incurred by ALT members fulfilling the role and duties of an ALT member are not Reimbursable Costs.
26	Corporate peer review and audit costs	No	These are not Reimbursable Costs.
27	Corporate entertainment	No	Costs incurred on corporate entertainment are not Reimbursable Costs.
28	Alliance reward and recognition schemes, team-building, entertainment etc.	Refer to Treatment	NOP1 and NOP2 - Annually, an Alliance Management Plan will be established where a budget for Reimbursable Costs associated with Alliance specific reward and recognition schemes (e.g. gifts to recognise achievements of full time alliance personnel) and for team building or entertainment (e.g. alliance team barbeques, Christmas events) will be recommended by the APM to the ALT, for ALT prior written approval. The Alliance Management Plan will be implemented by the APM.
29	Procurement tender and management costs	Yes	Costs associated with preparation of tenders and contracts for the engagements of Subcontractors and Suppliers and the normal administration of those contracts are a Reimbursable Cost.

No.	Item	RC?	Treatment
30	Legal costs	Depends	The costs associated with pursuing, defending or settling claims or civil lawsuits brought by or made against third parties (including any Subcontractor or insurer) arising out of or in connection with the Alliance Works, including legal and experts costs and any award of damages will be Reimbursable Costs provided that they are specifically approved by the ALT and incurred in accordance with ALT-approved procedures. Any award of damages made against a third party (including any Subcontractor or insurer) in favour of the Participants arising out of or in connection with the Alliance Works will be credited to and/or deducted from the Actual Outturn Cost. Legal costs incurred by a NOP associated with any legal action against the Owner or another NOP arising from this Agreement will not be Reimbursable Costs. Legal costs associated with formation and execution of this Agreement and the Alliance Development Agreement and similar NOP governance-related legal requirements are not Reimbursable Costs.
31	Donations and sponsorships	Depends	Costs associated with donations and sponsorships will only be Reimbursable Costs to the extent they have been outlined in the Project Proposal accepted by the Owner and are specifically approved by the ALT.
32	Alliance branding	Depends	Costs associated with alliance branding will only be Reimbursable Costs where such entitlement is: • outlined in the Project Proposal accepted by the Owner; or • in accordance with specific policies, procedures or protocols (as the case may be) recommended by the ALT and endorsed by the Owner (acting reasonably), in advance of any amount being incurred, recommended or determined; and • approved by the ALT, including with respect to funding (from an allowance in the TOC or otherwise from a contingency allowance within the TOC or from an under-run against the TOC) prior to the relevant amount being paid or reimbursed (as the case may be).

No.	Item	RC?	Treatment
33	Information and communications technology (ICT)	Refer to treatment	NOP1 – The following IT costs will be Reimbursable Costs in Limb 1 supported by detailed invoices: • Jobsite hardware, internet, phones; • Laptops, iPads, cellular phones; and • Copiers and printers. Any remaining IT Costs (including Gate Three (construction management software)) will be included in Limb 2, unless the cost is specifically directed by the Alliance Leadership Team (example: alliance specific software in addition to any software that the NOP would use in the normal course of business). NOP2 – IT Costs will be included in Limb 2, unless the cost is specifically directed by the Alliance Leadership Team (example: alliance specific software in addition to any software that the NOP would use in the normal course of business) including as: • Specifically evidenced by detailed invoice (as validated by the Financial Auditor); • Outlined in the Project Proposal accepted by the Owner (save and except where the proposed IT hardware or software solution was identified and recommended to the ALT after the Commencement Date); and • Approved by the ALT.
34	Information technology (ICT) - people	No	NOP1 – Not a Reimbursable Cost. NOP2 – Not a Reimbursable Cost.
		Yes	Costs associated with outsourced ICT support staff working at the Alliance project office on Alliance-specific software/hardware matters will be Reimbursable Costs.
		No	Costs associated with ICT support staff working at the NOP's corporate head office will not be Reimbursable Costs.

No.	Item	RC?	Treatment
35	ICT - software	Refer to Treatment	Costs associated with the use or purchase of software/licenses specifically for use in the Alliance project office or Alliance Site office/s specifically directed by the Alliance Leadership Team in addition to any software that the NOP would use in the normal course of business will be Reimbursable Costs where: • Specifically evidenced by detailed invoice (as validated by the Financial Auditor); • Outlined in the Project Proposal accepted by the Owner (save and except where the proposed IT hardware or software solution was identified and recommended to the ALT after the Commencement Date); and • Approved by the ALT.
		No	Software development costs associated with corporate software or other forms of non-Alliance specific software will not be Reimbursable Cost.
36	ICT – network and hardware	Yes	Costs of alliance/project/site-specific printers, monitors, servers, telephones (including cellular/mobile phones), phone and internet connections and other Alliance-specific ICT installations at the Alliance project office or Alliance Site office will be Reimbursable Costs where: • Specifically evidenced by detailed invoice (as validated by the Financial Auditor); • Outlined in the Project Proposal accepted by the Owner (save and except where the proposed IT hardware or software solution was identified and recommended to the ALT after the Commencement Date); and • Approved by the ALT.
37	ICT – operating costs	No	Refer to Item 33.
		Depends	Phone (including cellular/mobile phones) and internet/data usage charges to the extent that they relate to the Alliance Works will be Reimbursable Costs.

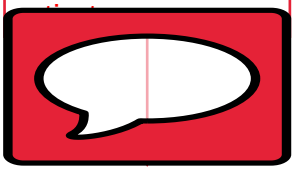
No.	Item	RC?	Treatment
38	Insurance	Depends	The costs incurred by a NOP in providing the insurances required pursuant to this Agreement will only be a Reimbursable Cost to the extent that the costs are additional to the costs that the NOP would have incurred anyway without the Alliance. Any deductible, excess or retention amount payable or incurred by a NOP or the NOPs under or in accordance with a policy of insurance effected by a Participant in accordance with Schedule 13, subject to Section S13.10(e), will be a Reimbursable Cost. Costs incurred by a NOP for supplementary policies (including those that relate to differences in the terms/conditions/limits of insurance policies) procured by a NOP for the benefit of that NOP, over and above and the terms/conditions required pursuant to this Agreement, will not be Reimbursable Costs.
39	Performance bonds, Parent Company Guarantees, bank guarantees and the like	No	Costs associated with the procurement and maintenance of parent company guarantees, unconditional undertakings and irrevocable letters of credit by a NOP (or a NOP's Guarantor's) to support a NOP's obligations under this Agreement are not Reimbursable Costs.
40	Financing costs	Yes	Financing costs arising from any negative cash flow under this Agreement, will be Reimbursable Costs. Project specific bank account setup costs will also be reimbursable costs.
41	Professional library	No	Costs related to the purchase or maintenance of a professional library, including periodicals, books, publications, subscriptions, etc., will not be a Reimbursable Cost.

No.	Item	RC?	Treatment
42	Major plant and equipment owned by a NOP	Yes	The actual costs of providing construction plant and equipment owned by a NOP to perform the Alliance Works will be Reimbursable Costs, subject to: (a) the rate for each item of plant/equipment must reflect the actual cost of providing the item without any return on capital, profit or corporate overhead component (but including depreciation costs); (b) the rate will be subject to audit and verification by the Financial Auditor in accordance with the above principles. Where there is a choice between using an item of plant owned by a NOP or hiring an equivalent item externally, the decision will be made on a Best For Project basis.
43	Minor plant and equipment (excluding tools of trade)	Depends	Where minor plant and equipment items (other than tools of trade) are purchased specifically for the Alliance and the NOPs do not intend to hold such assets on their own books, the capital cost of such items (but not any depreciation) will be a Reimbursable Cost, and the APM will maintain an asset register on behalf of the Owner to track all such assets with a value greater than $5,000 (excluding GST), and will arrange for their sale on the Owner's behalf when no longer required in accordance with Section S5.8(c).
44	Tools of trade	Depends	Costs associated with the tools of trade that a person normally owns themselves and bring to a project in order to perform his or her occupation (in accordance with the relevant employment agreement) will not be Reimbursable Costs. NOP1 – costs associated with tools required to perform Alliance Works not provided under the BCIB Contractor Agreement will be a Reimbursable Cost.
45	Health and safety, personal protective equipment (PPE)	Yes	All personal protective or site safety equipment, workplace health and safety requirements and the cost or expense to provide and maintain a safe working environment and to take all practicable steps to ensure the safety of all persons performing or affected by any aspect of the Alliance Works will be a Reimbursable Cost.
46	Mobilisation and de-mobilisation, Site accommodation	Yes	The cost of mobilising and de-mobilising to Site and all relevant Site accommodation in accordance with the mobilisation policy determined by the ALT will be a Reimbursable Cost.

No.	Item	RC?	Treatment
47	Materials and construction activity	Yes	Costs associated with materials and construction activity related to the Alliance Works will be Reimbursable Costs. Excess materials will be treated in accordance with Section S5.8(c).
48	Subcontractors and Suppliers	Yes	• Costs associated with the engagement and payment of Subcontractors and Suppliers required to perform the Alliance Works will be Reimbursable Costs. • Project-specific procurement related finance costs (including the costs of any bonds, surety, unconditional undertaking and/or irrevocable letter of credit and/or Subcontract Default Insurance) effected for the purposes of the Alliance Works (if any as approved by the ALT) provided by a Subcontractor in accordance with the terms of a Subcontract, will be Reimbursable Costs.
49	Major plant and equipment (hired from third parties)	Yes	The costs associated with hiring plant and equipment to perform the Alliance Works will be Reimbursable Costs. Note that where there is a choice between using an item of plant owner by a NOP or hiring an equivalent item externally, the decision will be made on a Best For Project basis.

Appendix 3 – Reimbursable Costs specific to NOP1 – EllisDon

The following 9 pages have been redacted in their



Appendix 5 – Not Used

Appendix 6 – Owner Alliance Costs (OACs)

Table 11 below identifies items which will be treated as Owner Alliance Costs (in both TOC and AOC) and the basis on which those costs will be quantified.

Table 11 – Owner Alliance Costs

Owner Alliance Cost Category	Basis of costing	Quantification parameters
1. a.) Owner's employees assigned to the alliance	Actual salary, including any annual increases, plus markup for benefits	Benefits Markup: 25.75% Working hours per year: 1,950
b.) Project Office Lease	Actual lease costs for Project Office, including janitorial costs	Annual escalation: 3%
c.) General Office	Actual costs for office supplies, equipment, computers, utilities, employee travel and other office support costs	Invoice value
2. Furniture and Minor Equipment procured by the Alliance (e.g., refrigerators, furniture, carts)	Actual supplier invoice cost	Invoice value
3. a.) Course of Construction and Wrap-Up Insurance (Owner)	Actual premium cost – including brokerage fees	Invoice value
b.) Professional Liability/Errors & Omissions Insurance (NOPs)	Actual premium cost – including brokerage fees	Invoice value
4. Costs associated with claims from third parties against the Owner arising out of the performance of the Alliance Works by the Participants to the extent that such costs are not covered by insurances in accordance with Section 14	Actual award or settlement amount	-
5. Other out-of-pocket expenses necessarily incurred by the Owner in performing or supporting the Alliance Work	Actual invoice cost	Invoice value

Appendix 7 – Hypothetical outcome scenarios

Preamble

This appendix contains the following spreadsheet extracts:

(a) Fully detailed 'sample scenario' with notes explaining how the financial outcomes for the Owner and each of the NOPs are calculated based on sample values for the two performance variables – i.e. the actual cost underrun/overrun and OKS.

(b) A table showing 16 scenarios that illustrate how different outcomes (for cost and OKS) impact on each Participant's financial outcome.

(c) A set of charts that illustrate the financial outcomes for the Owner and each of the NOPs for a cost outcome ranging between 15% under to 25% over (assuming the cost performance factor is the same for all Participants). Note that 3 separate chart lines are shown for each parameter:

- - - - - - - - - - - - - the value of the parameter if OKS = -100

——————————— the value of the parameter if OKS = 0

- - - - - - - - - - - the value of the parameter if OKS = +100

All scenarios and charts are based on the assumption that there are no Adjustment Events – i.e. the final TOC is the same as the Initial TOC (as shown in the build-up in Appendix 1 above.

Detailed sample scenario with explanatory notes:

	A	B	C	D	E	F	G	J	K	N	O	P	Q	R	S
1					Owner		Builder NOP		Architect NOP		Σ all NOPs		OKS pool		Owner + NOPs Total
2					VIHA		EllisDon		Parkin						
14	Target Outturn Cost			Total (estimated) OACs + RCs											
17				Total Limb 2 Fee $											
18				**TOC** = OACs + Limb 1 RCs + Limb 2 Fee											
24															
26	Hypothetical AOC			$PF - assume same all Participants											
27				Cost Performance Factor (each Participant)											
28				OACs/Limb 1 RCs											
29				Fee$ (Limb 2)											
30				**Actual Outturn Cost (AOC)**											
31				Ratio of NOP Limb 2 Fees within AOC											
33				**Underrun**											
44															
45		Total under/overrun sharing		Share %s											
46		(ignoring OKS)		Amounts											
47															
48		OKS	50	OKS shar											
49				OKS al											
50															
51				**Total Gainshare/Painsh**											
53															
54				Test against applicable caps											
55				Pains											
56															
57															
58				**Gain/Pain flowing to/from the N**											
59															
60	**Overall summary**														
61															
62	**Target**	OACs + Limb 1 RCs													
63		Fee (Limb 2)													
64		OAC/Limb 1 + Limb 2													
65		Limb 2 as % of Limb 1 for NOPs													
66															
67	**Actual**	OACs + Limb 1 RCs													
68		Fee (Limb 2)													
69		Nett Gainshare/Painshare (Limb 3) to/from NOP													
70		Limbs 1 + 2 + 3 (total revenue for NOPs)													
71		Limbs 2 + 3 (gross mark-up for NOPs)													
72															
73	**Returns**	Actual (L2 + L3) as a % of Limb 1 RCs allowed in													
74		Actual (L2 + L3) as a % of actual Limb 1 RCs (i.e.													
75		Actual (L2 + L3) as a % of (L1 + L2 + L3) (i.e. actu													

- The % figures in the red shaded cells in row 74 show, for each NOP (cells G74 to L74) and all NOPs combined (cell O74), the aggregate of Limb 2 and Limb 3 combined expressed as a % of actual Limb 1 reimbursable costs – i.e. the actual mark-up %.
- The % figures in row 75 show the aggregate of Limb 2 and Limb 3 expressed as a % of actual total revenue – i.e. the actual margin %.
- The blue-shaded figure in cell S74 shows the overall 'Owner spend factor' taking into account all payments to/from the NOPs - i.e. actual cost to Owner compared to the TOC.

Table of scenarios:

The sample scenario detailed above is scenario number 2 in the table below.

		Cost performance factor (PF) (actual/target)				% Under / Over	Actual Outturn Cost (AOC) $	$ Under / Over	OKS	Limb 3 cap 'headroom'	NOPs mark-up (Limb 2 ± Limb 3) / Limb 1						Owner outcome				
											EllisDon		Parkin		Σ all NOPs		Spend Factor	Over/under spend	Comprised of $m (in/out) related to		
		VIHA	EllisDon	Parkin	Avg						%	Amount	%	Amount	%	Amount			Cost $m	OKS $m	>Cap
	Cell reference in spreadsheet -->	E27	G27	K27	S27	T33	S30	S33	C48	O55	G74	G71	K74	K71	O74	O71	S74	S73	E46+Q46	-O49	Q54 (if <0)
1	All on target (neutral)																				
2	Good all areas (sample)																				
3	Excellent all areas																				
4	Extreme good (unrealistic)																				
5	Poor all areas																				
6	Very poor all areas																				
7	Extremely poor all areas (very unlikely)																				
8	Huge overrun, good OKS (unlikely)																				
9	10% overun, good OKS																				
10	10% underrun, poor OKS																				
11	Mixed cost performance A, OKS = 0																				
12	Mixed cost performance A, OKS = 50																				
13	Mixed cost performance A, OKS = -50																				
14	Mixed cost performance B, OKS = 0																				
15	Mixed cost performance B, OKS = 50																				
16	Mixed cost performance B, OKS = -50																				

Charts: financial outcomes for Owner and each NOP for a cost outcome ranging between 15% under to 25% (for OKS -100, 0 and +100)

SCHEDULE 6
PROGRESS PAYMENT SCHEDULE

Part 1
(to be completed by Alliance Project Manager)

1. The amount claimed by the Non-Owner Participants is as follows:

   To period ending: _____

		Builder NOP EllisDon	Architect NOP Parkin	Total
Limb 1 Reimbursable Costs to date ($L1_{TD}$)	Internal Limb 1 Reimbursable Costs	$	$	$
	Third party Limb 1 Reimbursable Costs	$	$	$
	Total Limb 1 Reimbursable Costs	$	$	$
Limb 2 to date ($L2_{TD}$)		$	$	$
Gross Entitlement to date [A] = ($L1_{TD}$ + $L2_{TD}$)		**$**	**$**	**$**
Less previous Gross Entitlement amount paid (excluding GST) [B]		$	$	$
Net Entitlement (excluding GST) [C] = ([A] - [B])		**$**	**$**	**$**
Less lien holdback [D]		$	$	$
GST applicable to Net Entitlement less lien holdback [E]		$	$	$
Amount Due under this Progress Payment Schedule ([C] - [D]) + [E]		**$**	**$**	**$**

2. I attach a report from each Non-Owner Participant setting out the amount which has been calculated in accordance with Schedule 5 to this Agreement.

3. All backup information requested by the Financial Auditor and/or the Payment Certifier has been provided to the Financial Auditor and the Payment Certifier.

4. Substantiation information (in addition to the NOP invoices) as requested by Owner and/or the

Financial Auditor and/or the Payment Certifier is attached.

Signed by Alliance Project Manager:

Name (Printed):

Date:

Part 2
(to be completed by the Payment Certifier)

1. As at the date of this Progress Payment Certificate I confirm to the Participants that I am satisfied, based on preliminary analysis and investigations of alliance cost recording and reporting systems and other information and documentation available to me, that the amounts claimed by each Non-Owner Participant and as stated in this Progress Payment Certificate, which matches the attached invoice from the Non-Owner Participants are, subject to confirmation in accordance with the Financial Audit Plan, a reasonable reflection of the Non-Owner Participants entitlement under Schedule 5 to this Agreement.

2. On receipt of this Progress Payment Schedule signed by the Payment Certifier, the Owner must pay the stated amount to the Non-Owner Participants in accordance with Section 8.6 of the Project Alliance Agreement.

Signed (Payment Certifier):

Name (Printed):

Date:

Part 3 – Subject to Section 8.4.4
(to be completed by the ALT Representatives)

1. As the ALT, we are satisfied that the Alliance has sufficient records, systems and procedures in place to track, manage and record the Non-Owner Participants entitlements to payment under this Agreement and that these records, systems and procedures are available to be, and are in a format suitable to be, subject to review and audit in accordance with this Agreement.

2. On receipt of this Progress Payment Schedule signed by the ALT Representatives, the Owner must pay the stated amount to the Non-Owner Participants in accordance with Section 8.6 of the Project Alliance Agreement.

Signed:

Name (Printed):

Date:

SCHEDULE 7
ALLIANCE MANAGEMENT SYSTEM

Development of Alliance Management System

Develop AMS

S7.1 The Participants will develop the Alliance Management System (**AMS**) to manage and govern and to provide the necessary level of assurance of the performance of the Alliance Works.

Purpose of the AMS

S7.2 The purpose of the AMS is to:

(a) establish the policies, procedures, protocols and management plans to guide and manage the AMT's and WPT's performance of the Alliance Works;

(b) provide the APM with the management framework to manage the overall performance of the Alliance Works;

(c) provide the ALT with the governance and oversight framework to enable the ALT to assure the Participants that the Alliance Works will satisfy the requirements of the Agreement; and

(d) enable the Participants to assure themselves that the Alliance Works will be performed in accordance with the Agreement to satisfy the Project Alliance Objectives.

Requirements of the AMS

S7.3 The AMS:

(a) where, and to the extent applicable, will be informed by and/or make reference to the Participants' existing management system policies, plans and procedures that would otherwise apply to the Alliance Works;

(b) will, to the extent practicable, incorporate finalized policies, procedures, protocols and management plans developed as "draft versions" during the AD Phase;

(c) will cover, as a minimum, the matters outlined in this Schedule 7 and as otherwise required in accordance with this Agreement;

(d) will be developed to reflect Gender-based Analysis Plus and the Cultural Safety and Humility policies, which must be taken into account in preparing, and the finalisation of, the management plans;

(e) will set out all key policies, procedures, protocols and management plans relating to the performance of all key aspects of the Alliance Works; and

(f) will specify the delegated limits of accountabilities and responsibilities and the protocols for review and change of those delegated limits, including which aspects of the AMS (if any) can be amended by the APM and which aspects can only be amended by the ALT.

S7.4 The Participants must do all things reasonably required to develop and agree the AMS:

(a) initially in accordance with this Schedule 7 and as otherwise required under this Agreement; and

(b) subsequently to amend or replace elements of the AMS as may be required under Section S7.2(d) of this Schedule 7 and as otherwise required under this Agreement.

Structure of AMS

S7.5 The structure and components of the AMS indicated in this Schedule 7 will not constrain the ALT in determining the final or optimal structure of the AMS, including the number of Management Plans and the coverage of each Management Plan, provided that, except as otherwise determined by the ALT, the AMS covers the matters listed in this Schedule 7.

S7.6 The APM will submit a detailed proposal for the completion of the AMS and each Alliance Management Plan to the ALT for approval at the first ALT meeting following the Commencement Date.

S7.7 The APM will then manage the development of the AMS by the Participants for submission to and approval by the ALT in accordance with the approved timeframe.

S7.8 Except as directed by the ALT, no substantial Alliance Work will be performed under this Agreement until such review and endorsement has taken place.

S7.9 The ALT may require periodic review and update of any part of the AMS where it considers such review and update is required to better achieve the Project Alliance Objectives.

S7.10 The AMS must cover the following matters in relation to the performance of all aspects of the Alliance Works.

Alliance Management Plan Requirements

	Management Plan	Management Plan Requirements	Indicative Time of Delivery from the Commencement Date
1	**AMS Structure**	Development of a structured approach to plan, manage and provide oversight to the management of the delivery of all aspects of the Alliance Works necessary to satisfy the Project Alliance Objectives, including structure and hierarchy of documents (e.g. Policies, Plans, procedures, work instructions, records/forms).	To be submitted to the ALT within 60 Business Days after the Commencement Date.
2	**Project Reporting Plan**	Development of a structured approach outlining the scope, frequency, and depth of reporting required to develop detailed and summary level reports (as the case may be) by the APM (with the support of the AMT) to report to, and brief, the ALT and each Participant on all key or material aspects of the performance of the Alliance Works, including: • Alliance Work status report (including key technical and non-technical issues) against relevant milestones on the progress of the key elements of the Alliance Works • Recommendations, and the status of progress against previous recommendations, on key technical and non-technical issues; • earned value reports including: ○ a reconciliation, as at the date of the report, of the AOC of performing the Alliance Works against the TOC; ○ any material errors or mistakes which have been made in the development of the TOC and identified by the Participants; • an updated risk and opportunity register identifying any innovations or breakthroughs which have been made or opportunities which have been realized by the Participants in performing the Alliance Works and any innovations or breakthroughs or opportunities which are forecast to be made or realized by the Participants; • the status of the Participants' performance in each KRA and KPI against the	To be submitted to the ALT within 60 Business Days after the Commencement Date.

		objectives of and requirements for each KRA and KPI; • reporting (including all applicable statistical analysis) of the Participants' performance in respect of workplace health and safety and applicable OHS Legislation; • reporting (including all applicable statistical analysis) of the Participants' performance against major elements specified in the various management plans; • reporting on employment status which addresses numbers of direct and indirect employees, construction labour, apprentices and CBA related priority hiring, including local residents, equity groups, Indigenous peoples, women and other visible minority groups traditionally underrepresented in the trades; • cashflow statements covering a 12 month forward rolling period; • proposed form and content of "dashboard reports" for reporting to meet the ALT's and each Participant's reasonable requirements; and • an outline of how the APM will deal with and manage any adverse trends or projections in relation to schedule, cost, or other matters which are central to achievement of the Project Alliance Objectives; and • any other information required by the ALT or a Participant necessary to validate compliance with this Agreement.	
3	**Financial Management**	Development of a plan for the management, control and reporting of all financial dealings and transactions incurred or entered into by the Participants for the performance of the Alliance Works, which includes the following: • cost control plan – outlines the approach to establishing, implementing and maintaining a robust secure cost control system (necessarily aligned to the work breakdown structure forming the basis of the work package structures of the TOC), sufficient to record, track, manage, analyse and report all Limb 1 Reimbursable Costs, Limb 2 Fee applied to Limb 1 Reimbursable Costs and Owner Alliance Costs consistent with GAAP and the PAA • financial reporting plan - outlines the approach to establishing, implementing	To be submitted to the ALT within 60 Business Days after the Commencement Date.

		and maintaining a robust secure financial reporting regime for the Alliance Works incorporating, at a minimum: ○ Monthly Financial Reports – reports of: ▪ comparison of *"AOC vs TOC"* for each past and current month of the current fiscal year; and ▪ forecast AOC for each remaining month in the current fiscal year, of all Limb 1 Reimbursable Costs, Limb 2 Fee applied to Limb 1 Reimbursable Costs and Owner Alliance Costs. ○ Quarterly Financial Reports – reports of: ▪ comparison of *"AOC vs TOC"* for each past and current quarters of the current fiscal year; ▪ forecast AOC for each remaining quarter in the current fiscal year, and ▪ updated annual forecast AOC for each of the remaining fiscal years to completion of the Alliance Works of all Limb 1 Reimbursable Costs, Limb 2 Fee applied to Limb 1 Reimbursable Costs and Owner Alliance Costs; and ○ Annual Financial Reports – reports of ▪ comparison of "actual vs target" for each past and current fiscal years; and ▪ an updated annual forecast AOC for each of the remaining fiscal years to completion of the Alliance Works, of all Limb 1 Reimbursable Costs, Limb 2 Fee applied to Limb 1 Reimbursable Costs and Owner Alliance Costs, all consistent with GAAP;	

		• financial audit plan - outlines the approach to establishing, implementing and maintaining an accurate, robust and secure series of audit activities consistent with GAAP to be undertaken by the Financial Auditor (with the assistance of the AMT), including at a minimum: ○ an independent audit by the Financial Auditor of the implementation of the cost control system and financial reporting regime within 60 Business Days of the Commencement Date of the Alliance Works; ○ regular ongoing financial audits (at intervals to be agreed by ALT within 60 days of the Commencement Date) that all Limb 1 Reimbursable Costs, Limb 2 Fee applied to Limb 1 Reimbursable Costs and Owner Alliance Costs are consistent with the Compensation Framework in the PAA; ○ the process for the Financial Auditor to review and make recommendations to address (including prepare a summary report for the ALT) any anomalies or inconsistencies identified through audit activities; ○ Confirm the roles and responsibilities of the NOPs, Owner, ALT and Financial Auditor for the ongoing series of audit activities. • Substantial Completion and Final Completion Audits - outlines the approach to establishing and implementing a detailed audit of: ○ all Limb 1 Reimbursable Costs, Limb 2 Fee applied to Limb 1 Reimbursable Costs and Owner Alliance Costs incurred by the Participants in the performance of the Alliance Works; and ○ determination of Limb 3 gainshare or painshare amounts (if any), within 60 Business days of the Substantial Completion Date and the Final Completion Date to ensure compliance with the Agreement.	
4	**Design Management**	Development of a structured approach to the management and performance of all activities relating to the design management, design, value assurance, documentation, peer review, verification and validation of the Alliance Works (including Temporary Works necessary for the performance of the Alliance Works) including: • a detailed workflow plan (including resource allocation) fully outlining how	To be submitted to the ALT within 40 Business Days after the Commencement Date.

		design development, submittals, submittal timing and review procedures will occur; • alignment with Schedule 2, Appendix P Asset Management; • facility threat and risk assessment; • a design approval framework incorporating, safety in design, whole of life cycle consideration and analysis, all requirements of Law and a stakeholder management and compliance matrix; • documentation requirements for design and work package documentation such as Wayfinding and Asset Numbering Master Plan; • User Groups Plans including structured process and schedule for user group engagement and feedback; • Use of virtual or augmented reality technologies; • Mock-up and in-site Prototype In-situ Plans; • Gender-based Analysis Plus; • BIM execution and integration plan to Owner databases (e.g. Asset Management); • Site Instructions; • As-Built Management; • Energy Management and Modelling Plan supporting the New Construction Program; • LEED Certification Plan; • Equipment Integration; • OHS (WorkSafe BC) Legislative Compliance Plan;	

		• CPTED; and • Risk Assessments – (e.g. IPAC, Sustainability, Emergency Management)	
4A	**Maintenance and Lifecycle Planning**	Development of models and plans for anticipated maintenance and lifecycle costings based on Attachment 2P-1 - Maintenance and Lifecycle Model to include: • CSA regulatory maintenance standards where appropriate and combine with manufacturer recommended and/or recognised standard maintenance frequencies i.e., RS Means, ASHRAE. • Apply best practice lifecycle median standards where appropriate and combine with manufacturer recommended and/or recognised standard lifecycle frequencies i.e., RS Means, ASHRAE. • Models to be sufficiently detailed to understand any assumptions made • Consistent with Appendix 2P - Asset Management. • Update: to the model to be aligned: o with the submission of the asset register three months following completion of the major architectural and engineering Design packages; o with the final draft asset register submission six months prior to Substantial Completion; and o with the final and confirmed asset register submission at Substantial Completion. • Baseline model should be within 10% (+ or -) of the final model. Updated models should be within 5% (+ or -) of the final model. • Align use of model with KRA Performance Management Plan.	Baseline model to be submitted to the ALT 60 Business Days after the Commencement Date.
5	**Construction Management**	Development of a structured approach to the management of the performance of all construction activities forming part of the Alliance Works outlining the roles, responsibilities, means and methods and techniques, for matters including:	To be submitted to the ALT within 60 Business Days after the Commencement

		• a requirement for each applicable NOP to enter into and comply with a BCIB-Contractor Agreement as required by the Employee Supply Agreement;
		• Resource Management Planning integrated with the Construction Schedule, including:
		  ○ Advance rolling forecast of labour needs; and
		  ○ Agreed upon level of details from contractors needed for hiring and coordination;
		• Labour demand and supply analysis coordinated in tandem with Construction Schedule in the form of regular (monthly) workforce requirement forecast updates in person hours and person power;
		• Site logistics for construction related activities access, security, offices and amenities, laydown, parking, hours of operations, temp services, waste management, etc.;
		• Construction Schedule – including Critical Path Modelling, resource histograms detailing trade and job classification requirements and cashflow modelling of anticipated AOC;
		• Permitting schedule;
		• Dust, noise, settlement, vibration, noxious odours, erosion control measures;
		• Construction completion (aligned with Start Up and Hand Over);
		• Habitat Management Planning;
		• Environmental incident response plan;
		• Waste Management;
		• Key and Access Control Plan;
		• Traffic control and site access management protocols and processes;
			Date.

		• Temporary Site Services, including relocation, augmentation and removal at completion • Excavation and disposal plan; and • Crane Planning.	
6	**Environmental Management Plan**	Development of a structured approach to managing the impact of the performance of the Alliance Works on the environment, including: • outlining a system and way of working that minimize environmental impact; • assuring the environment is not exposed to risks of unlawful damage or pollution; • developing and complying with procedures for avoiding and responding to environmental hazards or emergencies; and • developing procedures for engaging with any Authority regarding the environment and heritage protection.	To be submitted to the ALT within 60 Business Days after the Commencement Date.
7	**Quality Assurance Management**	Development of a structured approach to the quality of the performance of the Alliance Works including the development of a quality assurance system for the performance of the Alliance Works addressing: • the quality assurance and control requirements set out in the Specification; • a fully integrated QA management plan; • a description of key roles and responsibilities, including: o specific QA management plans, (e.g. CIV, ARCH); o Design QA, such as systematic checking, peer reviews and coordination; o Construction QA, such as testing and problem avoidance; o Ensure QA/QC reports include QA deficiency lists and quality incident	To be submitted to the ALT within 60 Business Days after the Commencement Date.

		reports; ○ Design performance and KPI; • inspection, testing, verification and validation requirements; • alignment with Schedule 2, Appendix 2P Asset Management; • quality assurance records management, including the requirements of Law; and • the reporting of compliance with the implemented quality assurance system, including non-conformance reporting, corrective and preventative actions and opportunities for improvements.	
8	**Respectful Workplace, Health and Safety Management Plan**	A Respectful Workplace policy and procedure(s) that outlines specific responsibilities and process to address issues, promoting a safe and respectful work place for all members and an on-site culture fostering an environment free of discrimination, including: • each Participant's health and safety legal obligations including Employer responsibilities; • the Owner and Prime Contractor's legal obligations under the OHS Legislation; • stakeholder, site and facility orientation; • emergency responder engagement (e.g. fire and police) and related training; • Site safety, security, and emergency planning; • providing an integrated approach that will support a culturally safe and respectful workplace culture at all levels of the Alliance that is free of discrimination and Indigenous-specific racism and which references the TRC Calls to Action, UNDRIP, DRIPA, and Human Rights legislation; • Culture Safety and Indigenous Cultural Competency Training and Equity Training for all persons performing Alliance Work; • ensuring all trade workers take part in Indigenous Culture Competency training	To be submitted to the ALT within 60 Business Days after the Commencement Date.

		(in cooperation with BCIB) • developing a safe system for racism disclosure and develop an alliance policy and procedure to address racism complaints • a Health and Safety Program, reflective of the requirements of the WorkSafeBC Certificate of Recognition (COR) program, and safety-related policy and procedures that achieve or exceed all occupational health and safety requirements and results in full accountability for safety obligations; • safety qualification, training and onboarding requirements for all persons performing Alliance Works; • Prime Contractor site safety orientation and training; and • Construction-related foundational and supervisor safety training.	
9	**Training and Orientation Plan**	Development of a structured approach to outlining how and when training and orientation will be implemented, including: • system and equipment qualification training; • emergency training; • training and orientation platforms; • identifying master trainers and responsibilities to train hospital staff; and • training management plan for Island Health staff and equipment.	To be submitted to the ALT within 60 Business Days after the Commencement Date.
10	**Procurement and Contracting Management**	Development of a structured approach setting out the requirements and processes for subcontracting, including: • a requirement that any procurement by a Participant for the purposes of performing Alliance Works will be procured on a Best for Project basis; • a requirement for each applicable Subcontractor of any tier to enter into and comply with a BCIB-Subcontractor Agreement as required by the Employee	To be submitted to the ALT within 60 Business Days after the Commencement Date.

		Supply Agreement; • the requirements and processes for procuring materials and services, and subcontracting elements of the Alliance Works; • the structure of the multi criteria analysis (consistent with best practice, fairness and transparency principles) that the Participants will apply in determining the most appropriate Best for Project procurement methodology for procuring goods and services for the performance of the Alliance Works • an authorization and approvals process for the entering into of Subcontracts; • identification of the key people involved in coordinating, controlling and or managing procurement and subcontracting activities, and their roles and responsibilities; • a requirement that any proposed transaction with an Affiliate shall be on market tested commercially reasonable arm's length terms and only negotiated and entered into upon the prior agreement of the ALT; • that any standard template for a Subcontract is developed for the ALT's consideration and approval which shall not be substantially deviated from without the ALT's approval, which must include: ○ terms which ensure that unencumbered title to unfixed materials will pass to Owner upon payment and are protected and insured to Owner's reasonable satisfaction; and ○ require that third parties enter into a direct agreement with the Owner, so that the Owner may exercise all rights under the Subcontract on and from Substantial Completion; or ○ that the benefit of the Subcontract is assigned, or otherwise transferred, to the Owner, so that the Owner may exercise all rights under the contractual arrangement or agreement on and from Substantial Completion.	

<table>
<tr>
<td>11</td>
<td>KRA Performance Management Plan</td>
<td>
As at the Commencement Date the Participants have agreed the KRA Plans attached as Schedule 18. The KRA Plans may be updated from time to time by the ALT and endorsed by the Owner. The KRA Plans provide the basis from which the KRA Performance Management Plans will be developed.

Development of a structured approach as to how performance will be measured in the Key Result Areas (KRAs) including:

• Description of the Key Performance Indicators (KPIs) used to measure performance in each KRA;

• Where more than one KPI is used for a KRA, details of the method by which a KPI performance score will translate into a KRA score, such as weighting reasonably reflective of the relative importance of that KPI to the Project Alliance Objectives in relation to that KRA;

• For each KPI:

○ Description of what the KPI will measure;

○ Numerical performance values relevant to the measurement methodology, including as a minimum the performance required to achieve the following KPI scores (Performance Nodes):

<table>
<tr><th>KPI score</th><th>Gainshare / Painshare in relation to that KPI</th></tr>
<tr><td>Minus 100%</td><td>Maximum painshare</td></tr>
<tr><td>Zero</td><td>Nil (Performance Target)</td></tr>
<tr><td>Plus 100%</td><td>Maximum gainshare</td></tr>
</table>
○ Measurement methodology detailing how actual performance will be measured and converted to a KPI score between minus 100% and plus 100% reflecting alliance performance in relation to that KPI.

• The KPI Measurement Framework must be consistent with the following principles:
</td>
<td>To be submitted to the ALT within 60 Business Days after the Commencement Date.</td>
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</table>

- KPIs should address aspects of the Project Alliance Objectives which are significantly impacted by the Alliance and for which performance has significant direct or indirect value to the Owner;
- KPI performance should be measurable by reasonably objective and repeatable methods;
- The numerical performance value at each Performance Node should reflect the rate at which value to the Owner increases or decreases when actual performance is above or below the Performance Target, and the realistic range of potential Alliance outcomes; and
- At the time of their establishment, performance values for each Performance Node must be set in accordance with the following guidelines:

KPI score	Characteristics
Minus 100%	• Level of performance that is materially detrimental to the Project Alliance Objectives
Zero	• Level of performance expected from a high quality, experienced, competent, and fully integrated Owner-NOP team working in accordance with the Alliance Principles • Significantly better than what would normally be achieved by the individual Participants working in a traditional limited collaboration contracting environment • Set at a P50 level such that there is equal (50%) probability of under-achievement or over-achievement within the TOC
Plus 100%	• Level of performance that will add material value to achievement of the Project Alliance Objectives over and above the Performance Targets • Genuine breakthrough performance through new ways of thinking.

12	**Records Management Plan**	Development of a structured approach to document control and records management detailing compliance, storage, maintenance, retention, access, transfer, format, structure, security and privacy aspects of all documentation and Records prepared by us for the purposes of performing the Alliance Works, including: • a file structure plan, detailing formats and structures of documents satisfying the Owner's requirements; • incorporating well-established collaboration platform (e.g. Aconex-like); • defect and compliance management platform; • photographic record platform; • access permission and point of contacts; • data, database and document management system (server must be Canadian-based); • intellectual property rights; and • compliance with FIPPA and Island Health records and information management requirements, including a documentation retention, storage and transfer plan.	To be submitted to the ALT within 60 Business Days after the Commencement Date.
13	**Delegations Matrix**	Development of a structured approach to the delegation of accountabilities and responsibility within our Alliance setting out the extent of delegations of operational (technical, commercial and financial) including which matters are delegated or capable of being delegated, and to whom, and the limits which apply at each level of delegation between the Owner, ALT, APM, AMT and WPT.	To be submitted to the ALT within 40 Business Days after the Commencement Date.
14	**People and Culture Plan**	Development of a structured approach to assist the management of our people, including: • the approach to developing and maintaining a high-performance cross-functional and cross-Participant team including: ○ means to overcome traditional client-contractor barriers that limit full collaboration and process optimisation;	To be submitted to the ALT within 40 Business Days after the Commencement Date.

		○ methods and approaches to enable those engaged in performing work under this Agreement to take full advantage of the potential for high performance which is created by a collaborative contracting environment; ○ leadership and high-performance culture development approaches including mentoring, coaching, feedback, periodic health-checks and the like; • requirements for good human resources management in the Alliance environment including personnel management, retention, development, apprenticeships, training, and other matters required to build and develop an engaged and productive workforce, in a manner to satisfy all Participants' requirements, including: ○ developing an objective and transparent process outlining the selection of members to participate in the Alliance; ○ developing clear documentation outlining details of the employment relationship (including employment status and reporting relationships) for members of the Alliance; and ○ developing a recruitment plan for roles and build a succession plan to ensure continuity should members leave the Alliance; and • the development of specific policies, procedures or protocols (as the case may be) to be recommended by the ALT and endorsed by the Owner, to establish a robust framework for entitlements to the payment of the following categories of Reimbursable Costs: ○ Bonuses (Schedule 5, Appendix 2, Item 14); ○ Relocation Costs (Schedule 5, Appendix 2, Item 15); ○ Personnel travel and accommodation Costs (Schedule 5, Appendix 2, Item 17); ○ Project Allowances (Schedule 5, Appendix 2, Item 18); ○ Living Away from Home Allowances (LAHA) (Schedule 5, Appendix 2, Item	

		19); ○ Alliance Branding Costs (Schedule 5, Appendix 2, Item 32).	
15	**Commissioning Manual**	As detailed in Schedule 2, Appendix H Testing and Commissioning development of a structured approach to identify the manner in which the commissioning and completion of the Alliance Works will be staged, how the Alliance Works will be handed over to the Owner, and a defects response schedule prepared and defects closed out. It is expected that the Commissioning Manual will address the roles and responsibilities (within the Alliance and separately to be performed by the Owner), mean and methods and techniques, and phases and stages of Commissioning including consideration of: • the Owner's Project Requirements; • the basis of Design, including sequence of operation; • the Commissioning Plan; • static verification, start-up, and Functional Performance Testing check sheets and reports; • the commissioning reports; • user and operator training reports; • Commissioning Team representatives contact details; • occupancy and operations evaluation reports, • all relevant Project reports and correspondence; • roles and responsibilities of all parties; • any other relevant element as agreed and defined by the Participants; • scheduling and coordination of clinical commissioning; and • post occupancy testing and validation (e.g. seasonal, weather, building loads) as a condition precedent to Final Completion.	To be submitted to the ALT within 80 Business Days after the Commencement Date.

16	**Equipment Plan**
	
	(Proponents to Note - this Plan is to be aligned with Schedule 2 of the Agreement)
		Development of a structured approach to outline and identify the manner in which the procurement and logistics for equipment will be managed by the Alliance including:
		
		• Organization - The Equipment Plan will identify the structure for equipment management including:
		  ○ a fair business policy and process
		  ○ guiding principles for the management and coordination of equipment;
		  ○ data base management and integration to the BIM environment; and
		  ○ clear roles and responsibilities required to achieve equipment needs.
		
		• Procurement - The Equipment Plan will provide for the approach for solicitation of proposals including
		  ○ standardization opportunities or bundled purchases;
		  ○ specification and quantities;
		  ○ equipment analysis and recommendations;
		  ○ equipment acceptance testing;
		  ○ Owner approvals;
		  ○ equipment procurement schedule; and
		  ○ equipment reports.
		
		• Logistics - The Equipment Plan will fully address and outline a detailed Logistic Plan that provides for:
		  ○ the responsibilities as outlined under Schedule 2 – Appendix 2I for both Owner and Alliance provided equipment;
		  ○ equipment verification through user group engagement;
			To be submitted to the ALT within 60 Business Days after the Commencement Date.

		○ schedules and logistics for delivery, arrival, storage, installation, inspection, and quality checks; ○ specific space, installation and integration requirements; ○ commissioning requirement integrated with the Commissioning Plan; ○ training requirements and resources integrated with the Training Plan; ○ hand over requirements integrated with the Start Up and Hand Over Plan; and ○ transfer of equipment from the existing CDH.	
17	**Start Up and Hand Over Plan**	Development of a structured approach to outline how Hand Over will be managed, including; • Facility and System Start Up Schedule: sequence of operations – coordinated with commissioning, System Start Up Schedule – Coordinated with Training and Orientation, Construction Clean and Terminal Cleaning Schedule; • Specific Owner requirements such as: Clinical, Infection Prevention and Control – final construction clean and terminal cleaning schedule, Facility Management Office, Clinical, OHS, Protection Services; • Occupancy Permit - Professionals of Record - Schedule Packages, Authority Health Jurisdiction, Fire Department hand-over; • Heliport Certification - design and construction interface with Heliport Operating Manual, Heliport Operating Manual, assignment of Accountable Executive, Transport Canada Certification and Protection Services and Fire Department orientation; • Operational Readiness - clinical commissioning, area set up, access – including keys; • Closeout activities (e.g. lessons learned, final reports, archive of documents); and	To be submitted to the ALT within 80 Business Days after the Commencement Date.

		• Activation.	
18	**Communication and Engagement Plan**	Development of a structured approach to share responsibilities (Owner, Prime Contractor and Alliance) regarding project and, community and stakeholder communications and engagement, including: • lead or supporting roles for communications; • emergency and issues management communications; • planning, community engagement; • media relations and media queries; • government relations and communications; • Stakeholder consultation – including engagement with local indigenous communities consistent with Owner's Indigenous Engagement Framework; • event planning and productions; • production and management of communications artefacts and tools; • Communications and escalation paths and decision points; • Roles, authority and level of participation of participants in external communications; • Regular project status communications for stakeholders and user groups; and • Alignment with Ministry of Health priorities, goals and objectives and apprise BC Government Communications and Public Engagement of external communications activities.	To be submitted to the ALT within 40 Business Days after the Commencement Date.
19	**Indigenous Engagement Plan**	Development of a structured approach to engagement with local indigenous communities aligned with CDHRP Indigenous Engagement Framework and BCIB policy - Outlining requirements for:	To be submitted to the ALT within 40 Business Days after the Commencement Date.

		• Policy/ framework to perform respectful indigenous engagement activities; • Decision points/ authority as to making any commitments to the communities; • Anti-Racism policy and procedure; • The level of indigenous engagement activities; and • Cultural Safety and Humility Training.	
20	**Infection Prevention and Control Plan**	Development of a structured approach outlining roles and responsibilities, means and methods, for complying with the Infection Prevention Control requirements for: CSA Z317.13 Infection Control during construction, renovation and maintenance of health care facilities and all referenced Standards under Z317.13, including: • Site Training • Train the trainer • Additional standards plan and implementation– construction material management e.g. ducts delivery and storage in situ • Phases of construction plan and implementation • Reporting breach of preventive measures; and • Management of in-situ prototypes.	To be submitted to the ALT within 60 Business Days after the Commencement Date.
21	**Risk and Opportunity Register and Management Plan**	Development of a structured approach describing how risks and opportunities will be managed during the performance of the Alliance Works, addressing the treatment, mitigation and management of risks, including: • risk and opportunity schedules; • risk and opportunity workshop updates;	To be submitted to the ALT within 60 Business Days after the Commencement Date.

		• risk mitigation and opportunity exploitation strategies; and • risk and opportunity platform and reporting.	
22	**Emergency Response and Incident Management Plan**	Development of a structured approach to emergency response and incident management identifying how the Participants will respond to, and deal with, an incident, which involves, or may involve, a breach of Law (such as the OHS Legislation or environmental laws) and/or the imposition of a fine or other sanction on any or all of us. The plan will consider the role and responsibilities of the Prime Contractor. Once an Emergency Response and Incident Management Plan has been developed, it will be implemented, on the basis of the following principles: • maintain transparency, and open lines of communication amongst all Participants (without sacrificing our right to legal professional privilege); and • continue to make decisions collectively and for the best interests of the Project.	To be submitted to the ALT within 60 Business Days after the Commencement Date.

SCHEDULE 8
KEY INDIVIDUALS

Role of Key Individual	Name of Key Individual	Commitment of Key Individual
ALT Representative (Owner)	Westley Davidson	As required to perform the role of an ALT Representative under the Agreement
ALT Representative (Owner)	Alice Gelpke	As required to perform the role of an ALT Representative under the Agreement
ALT Representative (Owner)	Brad Manderville	As required to perform the role of an ALT Representative under the Agreement
ALT Representative (NOP)	Tim Smith	As required to perform the role of an ALT Representative under the Agreement
ALT Representative (NOP)	Cameron Shantz	As required to perform the role of an ALT Representative under the Agreement
ALT Representative (IBC)	Jeff Good	As required to perform the role of an ALT Representative under the Agreement
ALT Representative (BCIB)	Johanna Navas	As required to perform the role of an ALT Representative under the Agreement
Alliance Project Manager		As required to perform the role of an APM under the Agreement
Lead Architect	Cameron Shantz	As required to perform the role of a Lead Architect under the Agreement
Construction Manager	TBD, subject to approval of ALT	As required to perform the role of a Construction Manager under the Agreement
Design Manager		As required to perform the role of a Design Manager under the Agreement
Lead Mechanical Engineer	Nick Stark	As required to perform the role of a Lead Mechanical Engineer under the Agreement

Lead Electrical Engineer	Domenic Bonavota	As required to perform the role of a Lead Electrical Engineer under the Agreement
Lead IMIT Designer		As required to perform the role of a Lead IMIT Designer under the Agreement
Clinical Planning Lead	Kyle Basilius	As required to perform the role of a Clinical Planner under the Agreement
Technical Lead Architect	Shane Czypyha	As required to perform the role of an Architectural Technical Lead under the Agreement
Indigenous Engagement Lead		As required to perform the role of an Indigenous Engagement Lead under the Agreement
Director of Procurement and Construction		As required to perform the role of a Project Director under the Agreement

SCHEDULE 9
ALT ACCOUNTABILITIES AND RESPONSIBILITIES MATRIX

Alliance Leadership Team			
Accountable for:	**As tested by:**	**Responsible for the completion of the following tasks:**	**Delegate?**
1. Development and deployment of the strategic framework for the Alliance	• Creation of a strategic framework	1.1 Create a vision and purpose for the Alliance	No
		1.2 Align on the Alliance Principles	No
		1.3 Align on the Owner's KRAs, Objectives and MCOS	No
		1.4 Deploy and implement Alliance Principles, Project Alliance Objectives and working together commitments	No
		1.5 Develop strategy to deploy Strategic Framework throughout the Alliance	Yes
2. Development and deployment of a transparent governance framework across the Alliance	• Creation of a governance framework	2.1 Endorsement of Alliance organisational structures	No
		2.2 Preparation of job description of APM	No
		2.3 Appointment of APM	No
		2.4 Performance management of APM	No
		2.5 Endorsement of job descriptions of AMT members	No
		2.6 Endorse succession plans for key functions	Yes
		2.7 Establish ALT modus operandi (including meeting, management, leadership and conflict of interest protocols)	No
		2.8 Approve limits of delegation and authority for APM and AMT	No

Alliance Leadership Team			
Accountable for:	**As tested by:**	**Responsible for the completion of the following tasks:**	**Delegate?**
		2.9 Endorse Alliance issue escalation and decision making processes	No
		2.10 Structure, resource and deploy the Alliance Management System necessary for the Alliance to achieve MCOS in the Owner's KRAs and Objectives	Yes
		2.11 Endorse management system	No
		2.12 Approve, review and amend the Alliance Management Plans	No
		2.13 Initiate internal and Third Party Management System audits, review reports and act on findings	Yes
3. Delivery and performance of obligations under this Agreement	• Audit against checklist	3.1 Prepare checklist of obligations arising under this Agreement obligations	Yes
		3.2 Monitor Alliance performance against checklist and take corrective action	Yes
		3.3 Issue directions, approvals and decisions under the Agreement	No
4. The Alliance achieving MCOS or better in the Owner's KRAs and Objectives	• Performance against KPIs	4.1 Establish and endorse KPIs, performance spectrum and measurement methodology	No
		4.2 Establish KPIs, performance spectrum and measurement methodology	Yes
		4.3 Set challenging targets in KRAs	No
		4.4 Maintain team focus on KRAs	Yes
5. Agreement upon a Compensation	• Compensation	5.1 Align on the Compensation Framework	No

Alliance Leadership Team			
Accountable for:	**As tested by:**	**Responsible for the completion of the following tasks:**	**Delegate?**
Framework for the Alliance which is robust, transparent and defendable	Framework	5.2 Model and test Compensation Framework	Yes
		5.3 Determine any Adjustment Events	No
6. Ensuring that reporting to all Participants is timely, accurate and comprehensive	• Audit against reporting • Feedback from the Owner's Representative	6.1 Review and adopt the Owner's reporting requirements	No
		6.2 Ensure Alliance reporting meets the Owner's reporting requirements	Yes
		6.3 Monitor the Owner's satisfaction with reporting and respond to assure satisfaction	Yes
7. Structuring and resourcing the Alliance so as to be able to achieve MCOS in the Owner's KRA and Objectives	• Organisation charts • People in position • Job Descriptions	7.1 Endorse organisational structure for key delivery phases	No
		7.2 Endorse organisational structures changes across the Project lifecycle	No
		7.3 Develop principles of selection, succession and access to people	No
		7.4 Ensure 'Best for Project' resources are provided to meet the demands of the Manning Plan and curve	Yes
8. Providing and maintaining corporate support of the Alliance	• APM and AMT feedback • Audit of minutes of ALT meetings	8.1 Document expectations of corporate support in the strategic framework and/or Alliance Management Plans	No
		8.2 Act on corporate support requests	Yes
9. Ensuring all ALT decision making is unanimous	• Audit of minutes of ALT meetings	9.1 Develop and document ALT decision making process (as part of modus operandi document)	No
		9.2 Endorse which issues require resolution/decision by ALT	No
		9.3 Document outcomes of ALT issues resolution and decision making	Yes

Alliance Leadership Team			
Accountable for:	**As tested by:**	**Responsible for the completion of the following tasks:**	**Delegate?**
		9.4 Ensure all actions, decisions and behaviours are consistent with Alliance Principles	Yes
10. Creating and sustaining a culture necessary to achieve exceptional Performance in all KRAs and Objectives	• Alliance People and Culture Development Plan • Alliance on-going health checks and surveys	10.1 Establish culture development and sustainment plan	Yes
		10.2 Monitor health of Alliance and act on any health issues	Yes
11. Implementation of the Owner's directions under this Agreement	• Feedback from the Owner • Compliance	11.1 See 3 above – obligations under this Agreement	No
12. Providing the leadership necessary for the Alliance to achieve the Owner's MCOS in all KRAs	• Performance against KPIs • APM and AMT feedback	12.1 Establish an alliance team charter (**Alliance Team Charter**) that defines Alliance vision, values, and behaviours	No
		12.2 Develop and model leadership behaviours consistent with the Alliance Team Charter	No
		12.3 Obtain feedback from APM and AMT on ALT leadership performance	No

SCHEDULE 10
APM ACCOUNTABILITIES AND RESPONSIBILITIES MATRIX

Alliance Project Manager			
Accountable for:	**As tested by:**	**Responsible for the completion of the following tasks:**	**Delegate?**
1. Deployment of the strategic framework of governing Alliance Principles, Project Alliance Objectives and Alliance Purpose throughout the Alliance, such that Alliance team members at all levels of the Alliance (including sub-contractors) understand the elements of the strategic framework and their part in its delivery.	• Display of strategic framework across the Site • Feedback from Alliance team members	1.1 Display prominently elements of strategic framework at all Alliance worksites	Yes
		1.2 Inclusion of strategic framework in inductions	Yes
		1.3 Integrate strategic framework in job descriptions	Yes
		1.4 Monitoring performance of the Alliance against strategic framework	Yes
2. Development, endorsement and implementation of the organisational structure for performance of the Alliance Works	• Organizational structure	2.1 Develop/refine organisation structure for TOC, delivery and update to reflect phase changes	Yes
		2.2 Develop resource plans in accordance with organisational structures and schedule	Yes
		2.3 Resource the team according to the resource plan	Yes
3. Development and deployment of AMT and AMT member job descriptions	• Job descriptions	3.1 Develop job descriptions for AMT	No
		3.2 Performance management of AMT members	No
4. Development and deployment of a performance management process for the WPT	• Performance management process	4.1 Develop performance management process	Yes
		4.2 Ensure performance management process is deployed	No
5. Establishing succession plans for Key Individuals	• Succession plan	5.1 Develop succession plans for Key Individuals	Yes

Alliance Project Manager			
Accountable for:	**As tested by:**	**Responsible for the completion of the following tasks:**	**Delegate?**
of the AMT and WPT		5.2 Develop succession plans for critical discipline leads and supervisors	Yes
		5.3 Endorse succession plans	No
6. Development and effective deployment of Alliance issue escalation and decision making processes	• Issue resolution and escalation protocol • Audit of issue resolution	6.1 Develop issue escalation and decision making protocol	Yes
		6.2 Endorse issue escalation and decision making protocol	No
		6.3 Deploy issue escalation protocol (e.g. include in inductions etc.)	Yes
7. Deployment of Alliance Management System appropriate to the delivery of outstanding outcomes in all KRAs across the Alliance	• System implementation • System audit	7.1 Implement the Alliance Management System	Yes
		7.2 Ensure the Alliance Management System is capable of integration with Participants' systems	Yes
		7.3 Deploy the alliance management system across the Site	Yes
		7.4 Train Alliance team members in alliance management system use	Yes
		7.5 Monitor system compliance	Yes
8. Development and deployment of management plans appropriate to the delivery of MCOS outcomes in all KRAs	• Management plans • Audit of plans	8.1 Development of management plans	Yes
		8.2 Deploy plans	Yes
		8.3 Monitor plan compliance and implement corrective actions where required	Yes
9. Development and deployment of a reporting regime to meet ALT and the Owner's needs	• Alliance (monthly) report	9.1 Ensure reports meet ALT needs	No
		9.2 Develop reports for ALT meetings	Yes
		9.3 Present reports at ALT meetings	No

Alliance Project Manager			
Accountable for:	**As tested by:**	**Responsible for the completion of the following tasks:**	**Delegate?**
		9.4 Amend reports based on ALT feedback	Yes
10. Development of a checklist of ALT, APM and AMT obligations under this Agreement, and ensuring that those relevant to the APM and AMT are delivered	• Obligations checklist • Compliance with Agreement	10.1 Develop checklist of obligations under this Agreement	Yes
		10.2 Deliver APM obligations	No
		10.3 Monitor and report on delivery of APM and AMT obligations	No
11. Establishment, deployment and reporting of KPIs, performance spectrum and measurement methodologies for Alliance performance in KRAs	• KPI reports	11.1 Define KPIs in each KRA	Yes
		11.2 Complete performance spectrum	Yes
		11.3 Define measurement methodology	Yes
		11.4 Collate and analyse and display and report performance data	Yes
		11.5 Act on performance data	No
12. The Alliance team maintaining its focus on achieving targets in all KRAs endorsed by the ALT, over the life of the project	• Performance in KRAs	12.1 Ensure Alliance team understands how they contribute to achieving KRAs	Yes
		12.2 Obtain personal commitments to contribute to KRA delivery (think global – act local)	Yes
		12.3 Publish and share KRA performance across all levels of Alliance	Yes
13. Development and deployment of a 'culture development and maintenance plan' that supports the delivery of the Project across the Alliance	• Culture development and maintenance plan	13.1 Develop People and Culture Development plan	Yes
		13.2 Deploy People and Culture Plan	Yes
		13.3 Monitor compliance with plan and act accordingly	Yes

Alliance Project Manager			
Accountable for:	**As tested by:**	**Responsible for the completion of the following tasks:**	**Delegate?**
14. The AMT and WPT being led in a manner consistent with Alliance Principles and Alliance Team Charter to achieve all aspects of Alliance Project Objectives	• Feedback from ALT, AMT and WPT • Performance against KRAs	14.1 Develop and model leadership behaviours consistent with the Alliance Team Charter	No
		14.2 Coach and mentor and monitor AMT leadership behaviours	No
15. Timely communication of information relevant to the performance of the project to all project personnel	• Feedback from project personnel • Alliance health checks	15.1 Dissemination of relevant information from ALT to AMT and the WPT	Yes
		15.2 Development of internal communications strategy and plan for the Alliance	Yes
		15.3 Deployment of the internal communications strategy and plan	Yes
		15.4 Monitor feedback from team and act accordingly	Yes

SCHEDULE 11
INTELLECTUAL PROPERTY

Owner Documentation

S11.1 Any Owner documentation or information supplied to the Alliance for the purposes of performing the Alliance Works will:

(a) not be used, copied or reproduced by a NOP for any other purpose; and

(b) remain the property of the Owner and be returned to it upon request.

Existing Intellectual Property Rights

S11.2 All IPR owned or held by the Owner at the Commencement Date, or developed by the Owner independently of the Alliance Works after the Commencement Date, (**the Owner's Existing Intellectual Property Rights**) will remain the property of the Owner. The Participants acknowledge and agree that any IPR vested upon creation in the Owner will be deemed to be part of the Owner's Existing Intellectual Property Rights for the purposes of this Section S11.2.

S11.3 All IPR owned or held by a NOP at the Commencement Date, or developed by a NOP independently of the Alliance Works after the Commencement Date, (**NOP's Existing Intellectual Property Rights**) will remain the property of that NOP.

Licence of Existing Intellectual Property Rights

S11.4 The Owner grants to the NOPs, until Final Completion, a non-exclusive, personal, non-transferable, royalty free, fully-paid licence to use, copy, modify, enhance, alter or decompile (**Use**) the Owner's Existing Intellectual Property Rights which are required by us for the performance of the Alliance Works.

S11.5 Each NOP grants to the Owner a non-exclusive, irrevocable, perpetual, sub-licensable, assignable, royalty free, fully-paid licence to Use the NOP's Existing Intellectual Property Rights which are required by the Owner for the:

(a) performance of the Alliance Works; or

(b) use, operation, support, maintenance, repair, renovation, and enjoyment of the Alliance Works and the Project.

S11.6 Each NOP grants to the other NOPs, until Final Completion, a non-exclusive, personal, non-transferable, royalty free, fully-paid licence to Use the NOP's Existing Intellectual Property Rights which are required by the Alliance for the performance of the Alliance Works.

Third Party Intellectual Property Rights

S11.7 If any third party's IPR forms part of the Alliance Works or is necessary for the proper functioning or operation of the Alliance Works or the Project (**Third Party Intellectual Property Rights**), we will ensure that the Owner is granted a licence to the Third Party Intellectual Property Rights for the use, operation, support, maintenance, repair, renovation, and enjoyment of the Alliance Works and the Project on the best available commercial terms.

Enhancements to Existing Intellectual Property Rights

S11.8 Any enhancement, improvement, adaptation, change, modification or development (**Enhancements**) of the Owner's Existing Intellectual Property Rights will be the property of the Owner.

S11.9 Any Enhancements of a NOP's Existing Intellectual Property Rights will be the property of the NOP.

S11.10 The Owner grants to the NOPs, until Final Completion, a non-exclusive, personal, non-transferable, royalty free, fully-paid licence to Use any Enhancements to the Owner's Existing Intellectual Property Rights which are required by us for the performance of our obligations or the Alliance Works.

S11.11 Each NOP grants to the Owner a non-exclusive, irrevocable, perpetual, sub-licensable, assignable, royalty free, fully-paid licence to Use any Enhancements to the NOP's Existing Intellectual Property Rights for the:

(a) performance of the Alliance Works; or

(b) use, operation, support, maintenance, repair, renovation, and enjoyment of the Alliance Works and the Project.

S11.12 Each NOP grants to the other NOPs a non-exclusive, personal, non-transferable, royalty free licence to Use any Enhancements to the NOPs Existing Intellectual Property Rights for the performance of the Alliance Works.

New Intellectual Property Rights

S11.13 All New Intellectual Property Rights created by a Participant vest immediately in that Participant.

S11.14 Each NOP grants to the Owner a non-exclusive, irrevocable, perpetual, sub-licensable, assignable, royalty free, fully-paid licence to Use any NOP's New Intellectual Property Rights for the:

(a) performance of the Alliance Works; or

(b) use, operation, support, maintenance, repair, renovation, and enjoyment of the Alliance Works and the Project.

S11.15 The Owner grants to the NOPs a non-exclusive, personal, non-transferable, royalty free, fully-paid licence to Use the Owner's New Intellectual Property Rights for the performance of the Alliance Works.

S11.16 Each NOP grants to the other NOPs a non-exclusive, personal, non-transferable, royalty free, fully-paid licence to Use the NOP's New Intellectual Property Rights for the performance of the Alliance Works.

Third party use of Intellectual Property Rights

S11.17 Each NOP acknowledges that notwithstanding Sections 15,16 or 17 of this Agreement the rights granted under Sections S11.5 and S11.11 include the right of the Owner, or a third party on behalf of the Owner, to Use each NOP's Existing Intellectual Property Rights, Enhancements to each NOP's Existing Intellectual Property Rights, and each NOP's New Intellectual Property Rights to do (directly or by engaging a third party or any one or more NOP to do) any of the following matters including:

(a) perform all or any part of the Alliance Works;

(b) use, operate, support, maintain, repair, renovate, and enjoy the Alliance Works;

(c) complete the Alliance Works if this Agreement is suspended or terminated; or

(d) remedy defects or omissions in the Alliance Works whenever occurring.

SCHEDULE 12
CONFLICT OF INTEREST DECLARATION

Name ……

Position

☐ ALT - Role ……

☐ AMT - Role ……

☐ WPT - Role ……

Employer ……

Declaration I faithfully declare that:

1 I have no personal interest in any matter, circumstance or thing or any relationship, arrangement or understanding; and

2 I am not aware, after having made the extent of reasonable enquiries available to me in my organisation, of my employer having any interest in any matter, circumstance or thing or any relationship, arrangement or understanding,

that prevents me from performing my role on a Best for Project basis, except for the disclosures, facts, circumstances, relationships, arrangements, understanding or things set out below:

……

……

……

……

Continuing Disclosure I acknowledge that I will, until Final Completion, continue to disclose all facts or circumstances that I am aware of, or if I am an ALT representative should reasonably be aware of, that are different from or alter my declaration

☐ Acknowledge

Signed…… **Date**……

SCHEDULE 13
INSURANCE CONDITIONS

Wrap-Up Liability Insurance

S13.1 The Owner will provide, maintain and pay for Wrap-up Liability Insurance with a limit of inclusive per occurrence and general aggregate for bodily injury, death, and damage to property including loss of use thereof.

S13.2 This insurance will include as named insureds the Owner and the NOPs and anyone employed by them to perform a part or parts of the Alliance Work (includes both construction and design services, but excludes all professional services, under this Agreement) but excluding suppliers whose only function is to supply and/or transport products to the project site or security protection persons or organizations providing site protection on or at the insured project. The insurance does not extend to any activities, works, jobs or undertakings of the insureds other than those directly related to the Alliance Work of this Agreement.

S13.3 The insurance will preclude subrogation claims by the insurer against anyone insured hereunder, subject to the professional services exclusion in Section S13.2.

S13.4 The insurance will include coverage for:

(a) products or completed operations liability (no less than or such longer period as the ALT decides);

(b) blanket contractual liability;

(c) cross liability/severability of interests;

(d) contingent employer's liability;

(e) personal injury liability;

(f) shoring, blasting, excavating, underpinning, demolition, pile-driving and caisson work, work below ground surface, and grading, subject to report and acceptance of such Alliance Work by insurers;

(g) liability with respect to non-owned licensed vehicles (with a sublimit of

(h) broad form property damage;

(i) broad form completed operations;

(j) limited pollution liability (sudden and accidental with 240 hours) including hostile fire (with a sublimit of no less than

(k) employees as additional insureds;

(l) blanket form tenants legal liability (with a sublimit of no less than

(m) use of attached machinery;

(n) loading and unloading from automobiles;

(o) loss of use without damage to property;

(p) hoist collision liability;

(q) watercraft (not in excess of 10m in length);

(r) medical payments of no less than per person and in the aggregate;

(s) physical damage to non-owned automobile (with a sublimit of no less than

(t) forest fire fighting expenses (with a sublimit of no less than and

(u) employee benefits administrative errors and omissions (with a sublimit of no less than

unless otherwise recommended by the ALT and endorsed in writing by the Owner.

S13.5 With deductibles of per occurrence except for completed operations which will have a deductible of unless otherwise recommended by the ALT and endorsed in writing by the Owner.

S13.6 This insurance will be maintained continuously from commencement of the Alliance Work until Substantial Completion of the Project, plus cover completed operations for a further period of no less than

Professional Liability Insurance

S13.7 The Owner will provide, maintain and pay for a project specific project professional liability insurance policy with an insurer, and on terms, acceptable to the Owner after consultation with the Participants:

(a) providing a professional errors and omissions liability insurance policy on a claims made basis during the period of cover;

(b) protecting all Participants as named insureds, together with any other parties (e.g. design consultants or subcontractors) to be named insureds as may be agreed by the Participants; and

(c) with a limit of per claim and with a limit of in the aggregate, such limits to be dedicated specifically to the Project.

This insurance will be maintained continuously from commencement of the Alliance Work until two years after Substantial Completion of the Project with a maximum self-insured retention of

S13.8 The costs incurred by the Owner to provide and maintain the project specific project professional liability insurance policy will be an Owner Alliance Cost.

Course of Construction Insurance

S13.9 The Owner will provide, maintain and pay (as an Owner Alliance Cost) for Course of Construction coverage, against "All Risks" of direct physical loss or damage including flood and earthquake, and will cover all materials, property, structures and equipment purchased for, entering into, or forming part of the Alliance Work whilst located anywhere on Site during construction, erection, installation and testing, but such coverage will not include coverage for the NOPs' and the subcontractors' equipment of any description. The insurance will include coverage for no less than:

(a) coverage in an amount of not less than the replacement value of the Alliance Work determined at the time of replacement with the following sublimits:

(i) for property insured under the policy and stored at an off Site location within Canada,

(ii) for property insured under the policy and in transit by land within Canada if such transport by land is not covered by marine cargo insurance,

(iii) professional fees to establish quantum of any covered loss,

(iv) firefighting expense,

(v) debris removal and clean up 20% of loss, subject to a maximum of whichever is less;

(vi) expediting expense,

(vii) extra expense,

(viii) testing and commissioning, and

(ix) off premises service interruptior (1km radius, a deductible waiting period of 72 hours, minimum

(x) valuable papers, with a sublimit of

(xi) interruption by civil authority or apparent civil authority with a sublimit of not less than (4 weeks, 1km radius, a deductible waiting period of 72 hours, minimum

(xii) prevention of ingress or egress (4 weeks, 1km radius, a deductible waiting period of 72 hours, minimum

(xiii) costs of demolition and the increased cost to repair or replace resulting from the application of bylaws or ordinances

(b) include coverage for:

(i) soft costs;

(ii) margin of profit;

(iii) escalation 110%;

(iv) underground services, temporary buildings and structures, temporary boilers and pressure vessels, scaffolding, false work, forms, hoardings, excavation, site preparation, landscaping and similar work;

(v) no exclusion of loss or damage caused by electrical or mechanical breakdown, with such insurance included either in the Course of Construction Policy or in a separate policy up until the Project Substantial Completion Date; and

(vi) no coinsurance clause or margin clause,

unless otherwise recommended by the ALT and endorsed in writing by the Owner.

S13.10 Deductibles, per occurrence, not exceeding the following amounts and if more than one deductible applies, the highest one will apply:

(a) For floods

(b) For water damage and sewer back up,

(c) For testing and commissioning,

(d) Design Error, LEG3 or equivalent,

(e) For earthquakes, a nominal "deductible of will be allocated by the Owner to the Actual Outturn Cost as an Owner Alliance Cost, with the Owner to pay any other deductible amount payable to insurers in the event of earthquake causing direct physical loss or damage to the Alliance Works outside of the Compensation Framework; and

(f) For all other insured perils,

unless otherwise recommended by the ALT and endorsed in writing by the Owner.

S13.11 Waiting period deductibles, per occurrence, not exceeding the following amounts to be applied separately from any property damage deductible:

(a) For soft costs, a one day waiting period for each month of the project duration subject to a minimum waiting period of and a minimum

S13.12 The coverage will include as named insureds, the Owner, each of the NOPS and anyone employed by them to perform a part or parts of the Alliance Work on the Project.

S13.13 The insurance will preclude subrogation claims by the insurer against anyone insured hereunder other than architects or engineers who are not employees of the Owner or a NOP (or otherwise an insured under the policy of insurance) for their liability in the event of loss caused by or resulting from any error in design or any other professional error or omission pertaining to the subject of such insurance.

S13.14 The Participants will take special precaution to prevent fires occurring in or about the Alliance Work and will observe, and comply with, all insurance policy warranties and all laws and regulations in force respecting fires.

S13.15 This insurance will be maintained continuously from 1 November, 2022, unless otherwise recommended by the ALT and endorsed in writing by the Owner until Substantial Completion of the Project.

Automobile Liability Insurance

S13.16 The NOPs will provide, maintain and pay for, and require all subcontractors to provide, maintain and pay for Automobile Liability Insurance in respect of all owned or leased vehicles, subject to limits of no less than inclusive per occurrence. The insurance will be placed with such company or companies and in such form and deductibles as may be acceptable to Owner (acting reasonably).

Aircraft and/or Watercraft Liability Insurance

S13.17 The NOPs will provide, maintain and pay for liability insurance with respect to owned or non-owned aircraft (including unmanned aerial vehicles) and watercraft if used directly or indirectly in the performance of the Alliance Work, subject to limits of no 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, include a cross liability clause, be endorsed to provide the Owner with advance written notice of cancellation and be placed with such company or companies and in such form and deductibles as may be acceptable to Owner.

S13.18 This insurance will be maintained continuously from commencement of the Alliance Work until Substantial Completion of the Project.

Contractors Pollution Liability Insurance

S13.19 The NOPs will require all subcontractors of every tier to provide, maintain and pay for Contractors Pollution Liability insurance, where the NOPs' performance (or the NOPs' subcontractor's performance) of the Alliance Work is associated with hazardous materials clean up, removal and or containment, transit, and disposal. This insurance must have a limit of liability of inclusive per occurrence insuring against bodily injury, death and damage to property including loss of use thereof.

S13.20 The Owner must be included as an additional insured but only with respect to liability arising out of the NOPs' performance of the Alliance Work. Such insurance will not be impaired by any biological contaminants (without limitation, mould and bacteria), asbestos, or lead-based paint exclusions. Such insurance to include sudden and gradual pollution events for third party liability including ongoing and completed operations.

S13.21 Any insurance required under Section S13.19 must be endorsed to provide the Owner with advance written notice of cancellation. If any such insurance is provided on a claims-made basis and that insurance is cancelled or not renewed, such policy must provide an extended reporting period.

S13.22 The NOPs must cause all subcontractors to provide to the Owner a Certificate of Insurance confirming all policies and endorsements necessary to comply with the insurance requirements outlined herein, or upon request, a certified copy of the required insurance policy.

S13.23 This insurance will be maintained continuously from commencement of the Alliance Work until Substantial Completion of the Project.

HCPP Property Coverage

S13.24 "HCPP" refers to the Health Care Protection Program administered and delivered by the Risk Management Branch (RMB) of the Ministry of Finance in conjunction with the Ministry of Health.

S13.25 From the commencement of the Alliance Work until Substantial Completion of the Project, the Owner will take out and maintain in force, or may cause to be taken out and maintained in force, under the HCPP, insurance covering medical, diagnostic or imaging equipment purchased for, entering into and forming part of the Alliance Work, that is not otherwise covered by the Course of Construction Insurance, and such policy:

(a) will be made available to the each of the NOPs by HCPP and HCPP's obligations under such policy will be supported by an indemnity from the Province of British Columbia in favour of HCPP;

(b) will provide insurance coverage comparable to or better than the coverage required for such equipment under the Course of Construction Insurance as described in Sections S13.9 to S13.15;

(c) Not Used; and

(d) will be on terms comparable to or better than those offered by insurers licensed in British Columbia

General

S13.26 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 each NOP'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 NOPs to obtain.

S13.27 The NOPs will also provide and maintain any other insurance that the NOPs are required by law to carry, or which they consider necessary.

S13.28 Unless specified otherwise, the duration of each coverage and insurance policy will be from the date of commencement of the Alliance Work until the Final Completion Date.

S13.29 The Owner will, upon request, provide the NOPs with proof of insurance of those coverages and insurances required to be provided by the Owner prior to commencement of the Alliance Work and subsequent certified copy of policies within a reasonable time period thereafter.

S13.30 The NOPs will provide the Owner with proof of insurance for those insurances required to be provided by the NOPs prior to the commencement of the Alliance Work in the form of a completed Certificate of Insurance and will also provide a certified copy of any required policies upon request.

SCHEDULE 14
PARENT COMPANY GUARANTEE

THIS GUARANTEE is made as of the ____ day of , 20__

BETWEEN:

VANCOUVER ISLAND HEALTH AUTHORITY,

(the "**Owner**")

AND

[♦] a corporation incorporated under the laws of [British Columbia]

(the "**Guarantor**")

WHEREAS:

A. The Owner, [**Name of relevant NOP**] ("**Subsidiary**") and [**Names of other NOPs**] have entered into a project alliance agreement dated as of [**date**] (which agreement, including the schedules thereto, as the same may be amended, modified, restated, supplemented or replaced, from time to time, is hereinafter called the "**Project Alliance Agreement**").

B. As an inducement to the Owner to enter the Project Alliance Agreement with Subsidiary, the Guarantor has agreed to absolutely, unconditionally and irrevocably guarantee to the Owner, as a direct obligation, the full and prompt performance and observance by Subsidiary of each and every covenant, agreement, undertaking and obligation of Subsidiary contained in the Project Alliance Agreement, and in furtherance thereof has agreed to enter into this Guarantee.

NOW THEREFORE IN CONSIDERATION of the mutual covenants and agreements of the parties hereinafter contained and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties covenant and agree as follows:

1. DEFINITIONS AND INTERPRETATION

1.1 Definitions

(a) Unless otherwise defined in this Guarantee, all capitalized terms will have the meanings ascribed to them in the Project Alliance Agreement.

(b) Unless otherwise expressly provided in this Guarantee, this Guarantee shall be interpreted in accordance with Schedule 1 [Definitions and Interpretation] to the Project Alliance Agreement.

(c) For the purpose of this Guarantee, the term "**Guaranteed Obligations**" has the meaning given in Section 2.1(a).

1.2 Survival

This Guarantee shall survive the termination or other expiry of the Project Alliance Agreement.

2. GUARANTEE

2.1 Guarantee does

(a) The Guarantor absolutely, unconditionally and irrevocably guarantees to the Owner, as a direct obligation, the full and prompt performance and observance by Subsidiary of each and every covenant, agreement, undertaking and obligation of Subsidiary contained in the Project Alliance Agreement (collectively, the "**Guaranteed Obligations.**

(b) Notwithstanding any other provision of this Guarantee the Guarantor's undertakings and obligations are derivative of and not in excess of the Subsidiary's obligations under the Project Alliance Agreement and the Guarantor retains all rights and limitations of liability possessed by the Subsidiary under the terms of the Project Alliance Agreement or arising from the parties' performance or failure to perform thereunder and shall be entitled to assert any contractual defences that would have been available to the Subsidiary.

2.2 General Provisions Relating to the Guarantee

(a) Each and every default in performance or observance of any of the Guaranteed Obligations by the Subsidiary shall give rise to a separate claim and cause of action under this Guarantee, and separate claims or suits may be made and brought, as the case may be, under this Guarantee as each such default occurs.

(b) The Guarantee in this Agreement shall be a continuing, absolute and unconditional guarantee of performance and observance of the Guaranteed Obligations and shall remain in full force and effect until each and all of the Guaranteed Obligations has been fully and satisfactorily discharged in accordance with the terms and provisions of the Project Alliance Agreement and the Guarantor has fully and satisfactorily discharged all of its obligations under this Guarantee.

(c) The liability of the Guarantor under this Guarantee shall remain in full force and effect irrespective of and shall in no way be affected or impaired by (and no notice to the Guarantor shall be required in respect of):

(i) the terms of the Project Alliance Agreement;

(ii) any compromise, waiver, renewal, extension, indulgence, amendment, addition, deletion, change in, modification of, or release of any security (including any other guarantee, letter of credit or bond) for or in respect of any of the Guaranteed Obligations;

(iii) any amalgamation, merger or consolidation of Subsidiary or the Guarantor or any sale, lease or transfer of any of the assets of Subsidiary or the Guarantor;

(iv) any Change in Control of Subsidiary or the Guarantor;

(v) the termination or other expiry of the Project Alliance Agreement;

(vi) any Adjustment Event;

(vii) any change in the financial condition of Subsidiary or the Guarantor;

(viii) any Act of Insolvency relating to the Subsidiary, or any resulting release, stay or discharge of any Guaranteed Obligation;

(ix) any lack or limitation of power, incapacity or disability on the part of Subsidiary or any other irregularity, defect or informality on the part of Subsidiary with respect to the Guaranteed Obligations;

(x) any provision of any laws, statutes, rules or regulations of general application in relation to suretyship or any other circumstance that might constitute, under law generally applicable to suretyship, a defence available to, or a discharge of, the Guarantor in respect of the Guaranteed Obligations or this Guarantee;

(xi) the assignment by the Owner in accordance with the provisions of Section 20.3 of the Project Alliance Agreement; or

(xii) any other occurrence or circumstance whatsoever, whether similar or dissimilar to the foregoing that, under law generally applicable to suretyship, might otherwise constitute a legal or equitable defence or discharge of the liabilities of a guarantor or surety that might otherwise limit recourse against the Guarantor.

(d) The obligations and liabilities of the Guarantor under this Guarantee shall not be impaired, diminished, abated or otherwise affected by the commencement by or against Subsidiary or the Guarantor of any proceedings under any bankruptcy or insolvency law or laws relating to the relief of debtors, readjustment of indebtedness, reorganizations, arrangements, compositions or extension or other similar laws.

(e) The Owner shall not be bound to exhaust its recourse against Subsidiary or others or any securities or other guarantees it may at any time hold before being entitled to performance of the Guaranteed Obligations by the Guarantor and the Guarantor renounces all benefits of discussion and division.

(f) It is the intent and purpose of this Guarantee that the Guarantor shall not be entitled to and does hereby waive any and all defences which are, under law generally applicable to suretyship, available to a guarantor, sureties and other secondary parties at law or in equity. Without limiting the generality of the foregoing, the Guarantor waives notice of acceptance of this Guarantee and of the non-performance by Subsidiary, diligence, presentment, protest, dishonour, demand for performance from the Owner and notice of non-performance or failure to perform on the part of the Subsidiary and all other notices whatsoever. This Guarantee is a guarantee of performance and compliance. In order to hold the Guarantor liable under this Guarantee there shall be no obligation on the part of the Owner at any time to demand or resort for performance to the Subsidiary, its properties or assets or to any security, property or other rights or remedies whatsoever, nor shall there be any requirement that the Subsidiary be joined as a party to any proceeding for the enforcement of any provision of this Guarantee and the Owner shall have the right to enforce the provisions of this Guarantee irrespective of whether or not legal proceedings or other enforcement efforts against the Subsidiary are pending, seeking resort to or realization upon or from any of the foregoing. Without limiting the foregoing, it is understood that repeated and successive demands may be made and recoveries may be had hereunder as and when from time to time, the Subsidiary shall default under or with respect to any of the Guaranteed Obligations, and that, notwithstanding recovery under this Guarantee for or in respect of any such default, this Guarantee shall remain in full force and effect unamended and shall apply to each and every subsequent default.

(g) Without prejudice to and without releasing, discharging, limiting or otherwise affecting in whole or in part the obligations and liabilities of the Guarantor under this Guarantee and without in any way requiring the consent of or giving notice to the Guarantor, the Owner may grant time, renewals,

extensions, indulgences, releases and discharges to and accept compositions from or otherwise deal with Subsidiary and/or the Guarantor or others, including any other guarantor, as the Owner may see fit and the Owner may take, abstain from taking or perfecting, vary, exchange, renew, discharge, give up, realize on or otherwise deal with security and guarantees in such manner as the Owner may see fit.

(h) Neither an action or proceeding brought under this Guarantee regarding the Guaranteed Obligations nor any judgment or recovery in consequence of that action or proceeding operates as a bar or defence action or defence to any further action that may be brought under this Guarantee. The Guarantor acknowledges that, if judgment is granted on an action or proceeding commenced under this Guarantee, the obligations of the Guarantor to the Owner do not merge with or end the Guarantor's obligations under this Guarantee.

(i) The liability of the Guarantor under this Guarantee shall arise forthwith after demand has been made in writing on the Guarantor.

(j) The Guarantor agrees to pay to the Owner any and all reasonable and direct out-of-pocket costs and expenses, including reasonable legal fees (on a substantial indemnity basis) incurred by it in connection with enforcing any of its rights under this Guarantee.

3. REPRESENTATIONS AND WARRANTIES

3.1 Guarantor Representations and Warranties

(a) The Guarantor represents and warrants to the Owner that as of the date of this Guarantee:

(i) the Guarantor is a corporation incorporated and validly existing under the laws of the jurisdiction of its organization, is in good standing with the [*Insert appropriate governmental authority*] with respect to the filing of annual returns, and has all the requisite corporate power and authority to own, lease and operate its properties and assets, to carry on its business as it is currently being conducted, to enter into this Guarantee and to perform its obligations hereunder and thereunder;

(ii) the Guarantor has the requisite power, authority and capacity to execute and deliver and perform this Guarantee, and to do all acts and things, and execute, deliver and perform all other agreements, instruments, undertakings and documents as are required by this Guarantee to be done, executed, delivered or performed;

(iii) no steps or proceedings have been taken or are pending to supersede, repeal or amend its constating documents, articles or by-laws or any shareholders agreement in a manner that would materially impair or limit its ability to perform its obligations under this Guarantee and such documents and agreements are in full force and effect as of the date hereof;

(iv) this Guarantee (when executed and delivered), have been duly authorized, executed, and delivered by the Guarantor and constitutes legal, valid, and binding obligations of the Guarantor, enforceable against the Guarantor in accordance with their respective terms, subject only to:

(A) limitations with respect to the enforcement of remedies by bankruptcy, insolvency, moratorium, winding-up, arrangement, reorganization, fraudulent preference and conveyance and other laws of general application affecting the enforcement of creditors' rights generally; and

(B) general equitable principles and the fact that the availability of equitable remedies is in the discretion of a court and that a court may stay proceedings or the execution of judgments;

(v) the authorization, execution, delivery and performance by the Guarantor of this Guarantee do not violate or conflict with, or constitute a default under:

(A) its constating or organizational documents or any unanimous shareholders agreement or similar rights agreement binding on the Guarantor;

(B) any applicable Laws; or

(C) any covenant, contract, instrument, agreement or understanding to which it is a party or by which it or any of its properties or assets is bound or affected;

(vi) the Subsidiary is [an indirect wholly owned subsidiary] of the Guarantor; [**NTD: to be updated to reflect Subsidiary structure**]

(vii) there are, to the knowledge of its senior management, no actions, suits, proceedings, or investigations pending or threatened against the Guarantor, at law or in equity, before any Authority or arbitral body (whether or not covered by insurance) that individually or in the aggregate could result in any material adverse effect on the business, properties, or assets, or the condition, financial or otherwise, of the Guarantor or in any impairment of its ability to perform its obligations under this Guarantee, and the Guarantor has no knowledge of any violation or default with respect to any order, writ, injunction or decree of any Authority or arbitral body that would result in any such material adverse effect or impairment; and

(viii) the Guarantor is able to meet its obligations as they generally become due.

4. NOTICES

4.1 Notices

Any notice or communication required or permitted to be given under this Guarantee 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:

if to the Owner:

▼

Attention: ▼

E-mail: ▼

if to the Guarantor:

▼

Attention: ▼

E-mail: ▼

or to such other address or electronic mail address as any party may, from time to time, designate in the manner set out above. 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 3:00 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 delivered by electronic mail during business hours (and in any event, at or before 3:00 pm local time in the place of receipt) on a Business Day, upon receipt, and if not delivered during business hours, upon the commencement of business hours on the next Business Day provided that:

(i) the receiving party has, by electronic mail or by hand delivery, acknowledged to the notifying party that it has received such notice; or

(ii) within 24 hours after sending the notice, the notifying party has also delivered a copy of such notice to the receiving party by hand delivery.

5. GENERAL

5.1 Amendments

This Guarantee may not be varied, amended or supplemented except by an agreement in writing signed by duly authorized representatives of the parties and stating on its face that it is intended to be an amendment, restatement or other modification, as the case may be, to this Guarantee.

5.2 Waiver

(a) No waiver made or given by a party under or in connection with this Guarantee shall be binding or effective unless the waiver is in writing, signed by an authorized representative of the party giving such waiver, and delivered by such party to the other party. No waiver made with respect to any right, power or remedy in one instance will be deemed to be a waiver with respect to any other instance involving the exercise of such right, power, or remedy or with respect to any other right, power, or remedy.

(b) Failure by either party to exercise any of its rights, powers or remedies hereunder or its delay to do so shall not constitute a waiver of those rights, powers or remedies. The single or partial exercise of a right, power or remedy shall not prevent its subsequent exercise or the exercise of any other right, power or remedy.

5.3 Entire Agreement

Except where provided otherwise in this Guarantee, this Guarantee, together with the Project Alliance Agreement and the documents ancillary to the Project Alliance Agreement, constitute the entire agreement between the parties in connection with its subject matter and supersedes all prior representations, communications, negotiations and understandings, whether oral, written, express or implied, concerning the subject matter of this Guarantee.

5.4 Severability

Each provision of this Guarantee shall be valid and enforceable to the fullest extent permitted by law. If any provision of this Guarantee is declared invalid, unenforceable or illegal by the courts of a competent jurisdiction, such provision may be severed and such invalidity, unenforceability or illegality shall not prejudice or affect the validity, enforceability and legality of the remaining provisions of this Guarantee. If any such provision of this Guarantee is invalid, unenforceable or illegal, the parties shall, acting in good faith, promptly negotiate new provisions to eliminate such invalidity, unenforceability or illegality and to restore this Guarantee as near as possible to its original intent and effect.

5.5 Enurement

This Guarantee shall enure to the benefit of, and be binding on, the Owner and the Guarantor and their respective permitted successors and assigns. This Guarantee may not be assigned by the Guarantor.

5.6 Governing Law and Jurisdiction

(a) This Guarantee shall be governed by and construed in accordance with the laws of British Columbia and the laws of Canada applicable therein and shall be treated in all respects as a British Columbia contract, without regard to conflict of laws principles.

(b) Both parties hereby irrevocably attorn to the exclusive jurisdiction of the courts of the Province of British Columbia and all courts competent to hear appeals therefrom.

5.7 Cumulative Remedies

Except as otherwise set forth in this Guarantee, the rights, powers and remedies of each party set forth in this Guarantee are cumulative and are in addition to and without prejudice to any other right, power or remedy that may be available to such party under this Guarantee or the Project Alliance Agreement or documents ancillary to the Project Alliance Agreement.

5.8 Further Assurance

Each party shall do all reasonable things, from time to time, and execute all reasonable further documents necessary to give full effect to this Guarantee.

5.9 Costs

Each party shall be responsible for paying its own costs and expenses incurred in connection with the negotiation, preparation and execution and delivery of this Guarantee.

5.10 Proof of Authority

The Owner and the Guarantor each reserve the right to require any person executing this Guarantee on behalf of the other party to provide proof, in a form acceptable to the Owner or the Guarantor, as applicable, that they have the requisite authority to execute this Guarantee on behalf of and to bind the Owner or the Guarantor, as applicable.

5.11 Counterparts

This Guarantee may be executed in one or more counterparts. Any single counterpart or a set of counterparts executed, in either case, by all the parties shall constitute a full, original and binding agreement for all purposes.

[SIGNATURE PAGES IMMEDIATELY FOLLOW]

IN WITNESS WHEREOF the parties have executed this Guarantee as of the date first above written.

VANCOUVER ISLAND HEALTH AUTHORITY

_____

Per:
Name:
Title:

[GUARANTOR]

Per:
Name: Title

SCHEDULE 15
NOT USED

SCHEDULE 16
FORM OF LETTER OF CREDIT

[Name and address of Issuing Bank in Vancouver, BC]

[Date of issue]

VANCOUVER ISLAND HEALTH AUTHORITY
[insert appropriate address]

[Attention]

(the "**Beneficiary**")

Re: Project Alliance Agreement dated [♦] between the Beneficiary, [**Names of the other NOPs**], and [**Name of NOP**] (the "**Applicant**") in respect of the Cowichan District Hospital Replacement Project.

By order of our client, the Applicant, we hereby issue our Irrevocable Standby Letter of Credit No. _____ (this "**Standby Letter of Credit**") in an amount not to exceed in the aggregate CAN$[♦] to the Beneficiary, effective immediately and expiring on **[Fixed and determinable date]** (the "**Expiry Date**").

We, **[Name of Issuing Bank]** (the "**Issuing Bank**"), at our offices shown above in Vancouver, British Columbia, Canada (the "**Offices**"), shall immediately pay to you under this Standby Letter of Credit any amount or amounts claimed, not to exceed in the aggregate CAN$[♦], upon presentation of a sight draft, appropriately completed, in the form of Annex 1 hereto (the "**Sight Draft**") being made upon us at our counter during normal business hours accompanied by the original of this Standby Letter of Credit and any amendments hereto.

Partial and multiple drawings are permitted.

If the Holder's Sight Draft, appropriately completed and the original of this Standby Letter of Credit and any amendments hereto are received by us at the Offices on or before the Expiry Date, we shall honour without enquiring whether you have a legitimate claim between yourself and the Applicant.

After the Expiry Date has elapsed, no draw shall be honoured by us save to any Sight Draft presented by the Holder according to the requirements of this Standby Letter of Credit prior to the Expiry Date.

All banking charges are for the account of the Applicant.

It is a condition of this Standby Letter of Credit that it shall be deemed automatically extended from year to year for successive one year periods from the Expiry Date (each anniversary of the Expiry Date thus becoming the new "**Expiry Date**"), but not beyond _____, unless we notify the Holder in writing at least 60 days prior to the then applicable Expiry Date that we irrevocably elect not to consider this Standby Letter of Credit renewed for such further period. Such notice must be sent by registered mail or courier, each with proof of delivery, to the Holder at the address set forth above or such other address designated by the Holder from time to time.

IT IS A CONDITION OF THIS STANDBY LETTER OF CREDIT THAT IT IS TRANSFERABLE AND MAY BE TRANSFERRED IN ITS ENTIRETY, BUT NOT IN PART, AND MAY BE SUCCESSIVELY TRANSFERRED BY THE THEN CURRENT HOLDER TO A TRANSFEREE. TRANSFER OF THIS STANDBY LETTER OF CREDIT TO SUCH TRANSFEREE SHALL BE EFFECTED UPON PRESENTATION TO US AT THE OFFICES OF THE ORIGINAL OF THIS STANDBY LETTER OF CREDIT AND ANY AMENDMENTS HERETO ACCOMPANIED BY A REQUEST DESIGNATING THE TRANSFEREE IN THE FORM ATTACHED HERETO AS ANNEX 2 APPROPRIATELY COMPLETED. All future amendments under this Standby Letter of Credit are to be advised directly to the transferee without the consent of, or notice to, any prior Holder and all future correspondence and notifications in respect of this Standby Letter of Credit are to be sent to the transferee and not to any prior Holder.

In this Standby Letter of Credit, "**Holder**" means either (i) if no transfer has occurred, the Beneficiary or (ii) if a transfer has occurred, the last transferee under the above provision.

DOCUMENTS SHALL BE PRESENTED AT OUR ADDRESS MENTIONED ABOVE OR AT THE [NAME AND ADDRESS OF ISSUING BANK] ON OR BEFORE THE EXPIRY DATE.

This Standby Letter of Credit is subject to and governed by International Standby Practices ISP 98 of International Chamber of Commerce publication no. 590.

All matters not covered by ISP 98 shall be interpreted and governed by the laws of British Columbia and the federal laws of Canada applicable therein. To the extent the terms hereof are inconsistent with the provisions of ISP 98, except where expressly stated otherwise, the terms of this Standby Letter of Credit shall govern. The parties irrevocably attorn to the exclusive jurisdiction of the courts of British Columbia. The number of this Standby Letter of Credit must be quoted on all documents required hereby.

[**Issuing Bank's Name**]

Per: _____
Authorized Signatory

•

Per: _____
Authorized Signatory

SCHEDULE 17
ADJUSTMENT EVENT GUIDELINES

Preamble

A scenario is an Adjustment Event (AE), subject to any comment in the same row as the scenario, if marked "1" in the column with the heading "Yes".

As stated in Section 12.3.2, the list of AEs as set out in these Adjustment Guidelines is exhaustive.

The various scenarios set out in these Adjustment Event Guidelines are not intended to be precise descriptions of specific events but are intended to be representative of the types of situations and circumstances that might occur.

The Adjustment Event Guidelines provide a guide for the ALT when determining whether a situation or circumstance justifies an Adjustment Event. For this purpose:

- The materiality or otherwise of the likely quantum is not relevant – in other words, if a situation or circumstance with a cost impact of $1 million is agreed to be an Adjustment Event then it would still be an Adjustment Event even if the cost impact was only $10. It will be up to the ALT, applying 'common sense', to provide guidance to the Alliance Project Manager (APM) as to minimum impact thresholds below which it is not worth the administrative effort (and distraction) of seeking an Adjustment Event notwithstanding that the Adjustment Event Guidelines indicate that in principle the Alliance is entitled to an Adjustment Event.

- Each AE scenario applies to both risks and opportunities. For example, an AE scenario describing an adverse outcome also applies where the event leads to a beneficial outcome.

No	Scenario	AE?		Comments
		Yes	No	
1	A critical piece of medical equipment that had been procured by the Owner is delayed in transit, despite best efforts of the alliance procurement team to manage its delivery. This delays the alliance's installation of the equipment by 2 weeks and incurs delay costs of $50k.		1	Alliance responsibility

No	Scenario	AE?		Comments
		Yes	No	
2	A key user group was unprepared for the volume of design drawing material they are asked to review within the timeframe agreed with that user group. This lengthens the review period significantly causing delays to the alliance and some abortive work costing $100k.		1	Although attributed to Owner, alliance responsibility is shared risk. This can be prevented by forecasting to user groups and policing their response and by prioritizing reviews which are at or near Critical path.
3	When installing a piece of medical equipment, it was found there was an error in the room specifications that the Owner had supplied to the alliance. This results in additional design costs of $50k and additional construction costs of $175k		1	The alliance together with the hospital must closely coordinate with vendors. The alliance must verify specifications directly with vendors.
4	When installing a piece of medical equipment, it was found there was an error in the equipment specifications that the Owner had supplied to the alliance. The corrected specifications results in the alliance incurring additional design and construction costs of ~$125k. Note these additional costs would have been incurred even if the Owner had provided the correct specifications in the first instance, as the corrected specifications were more stringent than those provided originally by the Owner.		1	

No	Scenario	AE?		Comments
		Yes	No	
5	When installing a piece of medical equipment, it was found there was an error in the equipment specifications that the Owner had supplied to the alliance. Had the Owner provided the correct specifications in the first instance no additional costs would have been incurred. However the subsequent adjustment to the specifications requires changes in design and disruptions in the procurement process which result in the alliance incurring additional costs of ~$125k.		1	
6	A crew of key trades supplied by BCIB walks off the job claiming that the site is unsafe. The union is called in and shuts down the site to investigate the workers' claims. Inspection revealed no basis for such a claim but this has led to subsequent delays in schedule and additional costs of $200k.		1	
7	Some NOP-supplied key trades personnel walks off the job claiming that the site is unsafe. A safety inspector is called in and shuts down the site to investigate the workers' claims. Inspection revealed no basis for such a claim but this has led to subsequent delays in schedule and additional costs of $200k.		1	
8	Integration of IMIT and Building Systems do not work as planned and it was found that the method of installation envisaged by VIHA and adopted by the alliance was inappropriate in this instance, causing minor failures. The alliance incurs additional costs of ~$1m associated with tracing the cause, additional testing, delays in schedule and equipment replacement.		1	

No	Scenario	AE?		Comments
		Yes	No	
9	During the detailed design, the team comes up with a more innovative and efficient, yet fully compliant, design for the [fire system] than the design that was priced into the Target Outturn Cost (TOC). This results in savings to the alliance of $300k.		1	
10	During the detailed design, the team proposes using a radical new carbon composite concrete mix for the ground slab in the goods receivable area which will remove the need for control joins and save ~$75k in construction costs. The Owner, based on a recommendation from the ALT, approves the proposal. Nearing the end of the Defects Correction Period serious cracking appears in the slab and the entire slab has to be removed and replaced using conventional concrete construction (including control joints) at a cost of over $450k.		1	
11	During the detailed design, the team finds that the preliminary design for the [fire system] is not going to meet the specifications requirements. This results in minor additional costs to the alliance of ~$10k.		1	
12	During the detailed design, the team finds that the preliminary design for the [fire system] is not going to meet the specifications requirements. This results in additional costs to the alliance of over $300k.		1	

No	Scenario	AE?		Comments
		Yes	No	
13	During advanced design stage the alliance determines that substantial and sustained savings in operating expenditure (OpEx) can be achieved by taking advantage of new technology. The additional cost to the alliance to adopt the new technology is ~$1.4m but estimated OpEx savings are in the order of $700k per annum. Despites some concerns about the 'reality' of this saving, the ALT directs the Alliance to proceed on the basis of the new technology.		1	The NOPs are incentivised under Limb 3 OKS system - where 15% of the OKS gainshare fund is allocated to Whole of Life and Environmental Sustainability (KRA4), as well as 15% allocated to Stakeholder Satisfaction (KRA2) which could also come into play. It is unlikely that the NOPs will simply "sit & wait" without an instruction from the Owner's Rep., for the following reasons: a) The potential NOP gainshare under KRA2 and KRA4 provides a strong commercial incentive for the NOPs to seek out and pursue innovations that enhance the WOL outcome for VIHA. b) It is expected that the NOPs will be motivated to look for ways to optimise the outcome for VIHA, just on the basis of their reputation and professionalism. c) If the CapEx cost was of a scale that it outweighs the financial benefits that would flow to the NOPs from gainshare under KRA4, the decision (on whether or not to adopt the new technology) ought to be reserved for the Owner (see more on this in item D below). If #13 is treated as a "Yes" then the NOPs could be "double-rewarded" or at least unfairly rewarded - by securing the benefit of gainshare under KRA4 without having to make any financial investment to secure that gainshare. The ALT has been established as the governing body for delivery of the capital phase of the new hospital. A decision on investing additional CapEx in order to secure future OpEx savings goes beyond the scope of the remit of the ALT. Such a decision, if it was required, ought to be reserved for the Owner alone to make.

No	Scenario	AE?		Comments
		Yes	No	
				The incentive associated with KRA4 within the OKS mechanism can be viewed as the Owner in effect delegating authority to the ALT to invest extra CapEx (to secure future OpEx savings) up to a point - i.e. to the extent that the NOP gainshare under the OKS justifies that investment. If the gainshare under the OKS is not sufficient in itself (without the need for an AE as well) to justify a decision to proceed, then the decision should be referred to the Owner's Rep. The Owner's Rep can then make the call as to whether VIHA wishes to proceed (which takes us to scenario 14).
14	During advanced design stage the alliance determines that substantial and sustained savings in operating expenditure (OpEx) can be achieved by taking advantage of new technology. The additional cost to the alliance to adopt the new technology is ~$1.4m but estimated OpEx savings are in the order of $700k per annum. Despite ALT misgivings about the 'reality" of this saving, the Owner's Representative directs the Alliance to proceed on the basis of the new technology.	1		In this event the ALT will need to have a conversation to review status of limb 3 KRA targets to ensure equitable adjustment
15	The Owner's Representative directs the alliance to incorporate some minor refinements to the flow of clean and dirty laundry that will enable better efficiency for [cleaning] staff. This change causes no delay to the alliance and costs the alliance less than $5k to implement.	1		As in scenarios 43 and 44, the alliance might want to maintain some form of on-going cumulative debit/credits ledger process for these types of AEs and only bring it to ALT for determination if net quantum is material.

No	Scenario	AE?		Comments
		Yes	No	
16	Due to difficulties with a transformer unit at the site, there is a loss of power to parts of the site causing stoppage of all works for a half day. This results in delay and disruption costs of ~$150k.		1	
17	Due to localised failure in power supply from BC Hydro, there is a loss of power to the site causing stoppage of all works for a half day. This results in delay and disruption costs of ~$150k.		1	
18	Early on in the delivery phase the design team realises that the concept design that the TOC was based on does not comply with the requirements of Schedule 2: Specification. A more complex design and construction solution is now required. This results in additional design costs of $600k and additional construction costs of $5m.		1	
19	During the peak of construction, a pathogen been found on site and as result, the site is locked down for a period of 3 days for deep cleaning with no employees allowed on site. Close contacts from the infected person's crew are required to isolate-at-home for 14 days. The alliance suffers a 4-day delay with delay and disruption costs totalling ~$650k.		1	* Wording modified at the workshop from the wording in original scenario
20	During the peak construction phase of the project the whole of BC is placed into a 1-month strict lockdown to contain a pathogen. Notwithstanding generous government support the alliance incurs standdown costs in excess of $15m plus a 6 week delay to the critical path.	1		Shutdown is being imposed by the BC government (like a change in law) - that makes this different to scenario 19 * Wording modified at the workshop from the wording in original scenario

No	Scenario	AE?		Comments
		Yes	No	
21	During testing and commissioning the Alliance discovers an incompatibility / integration issue with the TMS and ATO systems, due to ambiguities relating to interfaces between legacy systems and ETCS. The Alliance misses a CIM resulting in painshare of $50,000 and incurs additional costs of $100,000. Interfacing works (other contracts) also incur additional costs and delays.		1	
22	A large sink hole occurs during offsite construction on Bell MacKinnon Road (near the Herd Road intersection). The sink hole makes it difficult for construction workers and suppliers to access the hospital construction site, resulting in a 7 day schedule delay for hospital construction. The sink hole also necessitates significant design/scope changes to the road work package that is part of the Project's civil works, resulting in schedule delays of 21 days and additional design/construction costs of $1 million for this work package.		1	
23	Housing - During the design phase the AMT discovers a chronic shortage of accommodation around the Hospital site. It is determined this shortage can only be resolved by the installation of a temporary camp, which delays the project 6 months and adds $7m in additional costs.		1	

No	Scenario	AE?		Comments
		Yes	No	
24	To advance the project schedule the APM decides to initiate excavation on the site without First Nation or archaeological consultation. The excavation discovered several artifacts and the site is subsequently shutdown pending a review. This causes a 2 month delay to the schedule and additional cost of $3m.		1	
25	During the bulk excavation phase of the project indigenous artifacts are found on the north western portion of the site. It is determined that the best approach to move the project forward is to implement a "dig-sift" excavation program. This causes a 3-month delay to the schedule and additional costs of $4m.		1	
26	Upon activation of the Nurse Call System the Alliance discovers the sub-contractor has not constructed the system to achieve the design. Correction cost $1.2m		1	
27	Early during site clearing and excavation rare species of frogs/butterfly/snake are discovered that are considered protected species and must be relocated. This results in $150K in schedule delay and relocation costs.		1	
28	BCIB-supplied labour lacks hospital experience and IPAC training. This directly impacts the expected outputs, increases the level of rework and adds additional oversight, resulting in additional costs to the alliance in the order of $250k.		1	

No	Scenario	AE?		Comments
		Yes	No	
29	During an IPAC inspection it is discovered that a large portion of duct work is found to be substantially contaminated with construction dirt and dust, presumably as a result of inadequate precautions against ingress. This results in ~$200k of additional work in cleaning the duct and some schedule delays.		1	
30	Near the mid-point of hospital construction, BCIB is finding it increasingly difficult to source trades-qualified workers in several areas (e.g., carpenters, drywallers and electricians) through its labour supply channels and the NOPs are also experiencing significant challenges in attracting skilled trades workers in these areas. Construction schedule delays of 3-6 months and additional (un-budgeted) labour costs of $2-3 million (e.g., extra travel and accommodation costs for additional out-of-province workers) are expected to address these labour shortages		1	
31	Near the mid-point of hospital construction, BCIB is finding it increasingly difficult to source trades-qualified workers in several areas (e.g., carpenters, drywallers and electricians) through its labour supply channels. BCIB is unable to deliver some of the critical resources it has promised and the NOPs have to secure these resources through their sources and expedite their approval through the BCIB process. The alliance incurs schedule delays of 2 months and additional (un-budgeted) labour costs of $1.5 million (e.g., extra travel and accommodation costs for additional out-of-province workers).		1	

No	Scenario	AE?		Comments
		Yes	No	
32	Several of the NOPs' construction labour requests submitted to BCIB are either late or contain several errors, which require additional discussion and follow-up, and result in delays of workers arriving at the hospital construction site. This in turn requires the re-sequencing of certain work packages and results in related schedule delays and additional costs amount to ~$250k (e.g., delay claims from sub-contractors).		1	
33	Signs of stress and deflection are discovered in steel support members after the steel super-structure is assembled. Investigation reveals that some inspections were missed and confirms that major elements must be replaced. Rectification causes a 2-month delay and ~$2m in additional costs for the alliance.		1	
34	A municipal election is called several months prior to the permit submissions. The newly elected officials ran on a platform to reduce urban sprawl and growth within the community. This impacts the review and approval process, causing a 3-month delay and significant redesign of the hospital appearance.		1	Development permit delay risk, no change in by-law. Project is better served by the whole alliance dealing with the municipality together

No	Scenario	AE?		Comments
		Yes	No	
35	Construction and commissioning are substantially complete. The Psychiatry team have just completed a tour of their area and discover that the final constructed area has over-looked installing three corridor doors that are deemed critical to patient and staff safety. Looking back on User group minutes they are noted as required but did not get into the issued-for-construction documents. This results in $125k of additional costs and delays substantial completion.		1	
36	During construction there is a catastrophic failure in the slab supports resulting in a significant structure collapse with one fatality and several injuries. This results in a shut-down of the site and a 3-month delay to the critical path. The alliance incurs additional costs in the order of ~$15m.		1	
37	Allegations by an indigenous worker on site of repeated incidents of discrimination against her by members of a team engaged as a subcontractor on the project through NOP1 are escalated to the BC Human Rights Tribunal (BCHRT). The BCHRT finds in favour of the complainant and directs NOP1 and the subcontractor to pay substantial amounts in damages. Additionally the whole affair causes significant delay and disruption to parts of the project causing the alliance to incur additional costs well in excess of $2m.		1	

No	Scenario	AE?		Comments
		Yes	No	
38	Allegations by an indigenous worker on site of repeated incidents of discrimination against her by members of a team engaged as a subcontractor on the project through NOP1 are escalated to the BC Human Rights Tribunal (BCHRT). The BCHRT, for various reasons, finds that there was no discrimination and dismisses the case. Nonetheless the whole affair causes significant delay and disruption to parts of the project causing the alliance to incur additional costs well in excess of $2m.		1	
39	Allegations by an indigenous worker on site of repeated incidents of discrimination against her by employees of VIHA are escalated to the BC Human Rights Tribunal (BCHRT). The BCHRT finds in favour of the complainant and directs VIHA to pay substantial amounts in damages. The whole affair causes significant delay and disruption to parts of the project causing the alliance to incur additional costs well in excess of $2m.		1	
40	Allegations by an indigenous worker on site of repeated incidents of discrimination against her by employees of VIHA are escalated to the BC Human Rights Tribunal (BCHRT). The BCHRT, for various reasons, finds that there was no discrimination and dismisses the case. Nonetheless the whole affair causes significant delay and disruption to parts of the project causing the alliance to incur additional costs well in excess of $2m.		1	

No	Scenario	AE?		Comments
		Yes	No	
41	A week-long heat wave causes power loss and construction machinery to breakdown resulting in significant delay and disruption and reduction in productivity. The event results causes the alliance to incur additional (un-budgeted) costs of more than $350k.		1	
42	The project is constructed during an unprecedented spell of weather that is very favourable to efficient construction. The alliance saves ~$2.5m because it incurs only a small portion of the ~$3m risk provision that it had included in the TOC for inclement weather.		1	
43	During the later stages of the fitout there is a change in clinical leadership at VIHA and having reviewed the site and the approved design documentation VIHA directs that one floor of the D&T building is totally redesigned to meet the new clinical direction. The project is delayed by up to 12 months and the additional cost arising from implementing the direction is in the order of $50m.	1		
44	During the later stages of the fitout there is a change in clinical leadership at VIHA and having reviewed the site and the approved design documentation VIHA directs some minor changes to the layout of the D&T building to align with the new clinical direction. The additional work, costing in the order of just $15k, can be accommodated without any delay to the critical path	1		This is an AE based on the same principle as scenario 43. The alliance might want to maintain some form of on-going cumulative debit/credit ledger for these types of AEs and only bring it to ALT for determination if net quantum is material.

No	Scenario	AE?		Comments
		Yes	No	
45	The planned scope of kitchen works was based on the CDH kitchen providing food services to the CDH as well as 3 other healthcare facilities: Cairnsmore Place, Cowichan Lodge and Walden House. During delivery VIHA decides to construct a kitchen within Cairnsmore Place to provide food services for Cairnsmore and the other two non-CDH facilities. Accordingly the size and capacity of the CDH kitchen is significantly reduced. Even allowing for redesign and some wasted costs, there is likely to be a net reduction in the alliance cost of $1.5m - $2.0m.	1		
46	During the early stages of detailed design, following a strategic review VIHA decides that a section of the new hospital is not going to be built for the foreseeable future. VIHA directs the alliance to omit that portion of the works from the alliance scope and modify the design so that the cost to add the omitted portion (at a later date should VIHA decide to do so) is minimised. The net reduction in the cost to deliver the project, allowing for all redesign and disruption is ~$75m.	1		
47	The TOC included strategies and associated schedule, cost and contingency allowances for dealing with supply-chain and resource constraints expected to arise with a myriad of infrastructure projects competing for limited resources in a resurgent post-pandemic global economy. As it happened the challenges faced were worse than anticipated with the alliance incurring additional associated costs of ~$20m beyond what it had allowed for in the TOC.		1	

No	Scenario	AE?		Comments
		Yes	No	
48	The TOC included strategies and associated schedule, cost and contingency allowances for dealing with supply-chain and resource constraints expected to arise with a myriad of infrastructure projects competing for limited resources in a resurgent post-pandemic global economy. As it happened the challenges faced were not nearly as bad as expected and the associated costs incurred by the alliance were ~$20m less than what was allowed for in the TOC.		1	
49	During the fitout phase of the construction it is noted that the structure appears to be settling in the south west corner and re-leveling of the floors is required. There is a protracted debate about how best to correct this defect, causing a 1 year delay and $25m in additional costs.		1	
50	The TOC was based on assumptions that were informed by a functional program report by a specialist technical consultant engaged by VIHA long before the alliance was formed. It transpires that there was an error in the information and/or conclusions set out in the report. As a result the alliance incurs additional costs in planning and making changes to sequencing, location and/or layout of rooms/facilities, but these changes do not amount to a clear increase/decrease in the core functional requirements of the hospital.		1	** Agreed by interim ALT (including amendment to wording of the scenario) after the alignment workshop.*

No	Scenario	AE?		Comments
		Yes	No	
51	Notwithstanding extensive dialogue with User groups throughout the design process, during commissioning members of VIHA clinical staff require significant changes in the positioning, user-interface or other aspects of medical equipment. Taken in total these cause the alliance to incur additional unexpected costs in the order of $750k.		1	Not an Owner-directed change, rather these changes are accepted by the ALT as appropriate. Where the ALT does not agree to implement the changes requested/demanded by the User Group, then it would be referred to Owner Representative who could direct the alliance to implement (in which case it would be an AE).
52	During the early stages of commissioning it becomes apparent that the bank of back-up generators will not have sufficient capacity to meet emergency power needs. The alliance has to supply and install an additional generator and make the necessary changes in the system to incorporate the new unit. No delay to the critical path but additional costs close to $750k.		1	
53	During testing and commissioning the alliance is unable to get the air-conditioning system to maintain temperatures within required limits. Although only falling slightly outside the required limits extensive work is required, the alliance has to spend ~$150k replacing two units with larger units and reconfiguring sections of ducting in order to make the system meet the requirements.		1	

No	Scenario	AE?		Comments
		Yes	No	
54	To align with its new staff development program the Owner's Representative directs the alliance to alter the sequence of construction and commissioning so that the services centre of the new hospital is available for early handover. The alliance incurs additional costs in the order of ~125k revising its construction and commissioning schedule to meet the new handover requirement.	1		* In the original wording of this scenario, the term "VIHA" was used rather than "Owner's Representative". It has been changed because "Owner's Representative" is the more appropriate/precise term to use.
54A	To align with its new staff development program VIHA requests the alliance to alter the sequence of construction and commissioning so that the services centre of the new hospital is available for early handover. The ALT agrees on a best-for-project basis to do this and directs the alliance accordingly. The alliance incurs additional costs in the order of ~125k revising its construction and commissioning schedule to meet the new handover requirement.		1	*Additional scenario inserted during the alignment workshop*
55	To align with its new staff development program Owner's Representative directs the alliance to alter the sequence of construction and commissioning so that the services centre of the new hospital is available for early handover. The alliance is able to accommodate this request with only minor adjustments to its construction and commissioning schedule, with associated additional costs of ~$12k.	1		* In the original wording of this scenario, the term "VIHA" was used rather than "Owner's Representative". It has been changed because "Owner's Representative" is the more appropriate/precise term to use.

No	Scenario	AE?		Comments
		Yes	No	
55A	To align with its new staff development program VIHA requests the alliance to alter the sequence of construction and commissioning so that the services centre of the new hospital is available for early handover. The ALT agrees on a best-for-project basis to do this and the alliance is able to accommodate this request with only minor adjustments to its construction and commissioning schedule, with associated additional costs of ~$12k.		1	*Additional scenario inserted during the alignment workshop*
56	A contractor engaged by VIHA to undertake work outside the scope of the alliance suffers a serious safety incident that restricts access to the alliance site for a week. The alliance incurs additional costs in the order of $200k as a result.		1	
57	A supply contract for oxygen reticulation system is based on VIHA contract documentation and procurement advice. It turns out that the terms of the supply contract are so poorly drafted that the supplier is contractually entitled to 5% more than the apparent contract payment stated in the contract. The contract costs the alliance $50k more than it had expected.		1	
58	One of the diagnostic imaging devices procured through VIHA (the purchase cost of which is separate from the TOC) fails during testing and commissioning. VIHA's supplier replaces the machine at its own cost. However the alliance incurs significant delay and additional costs of ~$150k as a result of the delay and disruption.		1	

No	Scenario	AE?		Comments
		Yes	No	
59	The process by which the design of critical elements are approved by VIHA takes, on average, 2 to 3 weeks longer than expected, despite the approvals timetable that was discussed and agreed at the start of the alliance. As a result the critical path slips by 2 weeks and the alliance also incurs associated disruption costs of ~150k.		1	
60	Soon after an early election that returned it to majority government, the Canadian Government, in an unexpected move, increases the rate for employer contribution to the Canadian Pension Plan, beyond the incremental rate set out in the 7-year plan. The estimated impact of the additional employment costs for the alliance for the remainder of the project is in the order of $5m.	1		
61	Consistent with the commitments made by the Canadian Government at the COP26 Climate Change Conference in Glasgow in late 2021, in mid-2022 the BC Government revises the legislation relating to greenhouse gas emissions, increasing the Provincial carbon tax and imposing a more rigorous compliance regime. The alliance incurs significant additional costs, both directly relating to the increased tax ($75k) and developing suitable monitoring and compliance systems ($80k).	1		

No	Scenario	AE?		Comments
		Yes	No	
62	In mid-2022 the BC Government revises the legislation relating to greenhouse gas emissions, increasing the Provincial carbon tax and imposing a more rigorous compliance regime - measures that were unexpected and go well beyond the commitments made by the Canadian Government at the COP26 Climate Change Conference in Glasgow in late 2021. The alliance incurs significant additional costs, both directly relating to the increased tax ($75k) and developing suitable monitoring and compliance systems ($80k).	1		
63	Following 3 years of extensive consultation with industry and all affected stakeholders, on 1st July 2022 the 2022 update of the National Building Code of Canada comes into effect. Compliance with the new code requirements causes the alliance to incur additional design and construction costs in the order of $1m.		1	
64	Unprecedented extreme weather conditions - wildfires following the long dry spell followed by monsoonal rains and floods - cause a 1 month delay to the critical path and additional costs of ~$12m.		1	
65	The alliance team encounter difficulties when seeking to integrate software from the various IMIT systems. It appears that different teams have developed their respective systems in accordance with specified requirements but the integrated system simply does not work reliably. The alliance incurs additional costs close to $15m and the completion is delayed by 1 week.		1	

No	Scenario	AE?		Comments
		Yes	No	
66	The delivery of critical long-lead equipment is delayed for 3 months when the ship it is on is hijacked in the East China Sea. The alliance does its best to mitigate the impact but suffers a net delay of 1 month to the critical path and disruption costs of ~$500k.		1	
67	To take advantage of, and build on, VIHA's respect profile within the community, the alliance purchases a range of material and services directly through VIHA (rather than through one of the NOPs). The VIHA employee leading the procurement of these items mismanages the procurement resulting in the alliance incurring additional costs (unclear or incorrect specifications, poor quality control, rework and excess wastage, etc.) in the order of $180k.		1	
68	To take advantage of, and build on, VIHA's respect profile within the community, the alliance purchases a range of material and services directly through VIHA (rather than through one of the NOPs). The VIHA employee leading the procurement of these items does a superb job in the procurement resulting in the alliance achieving significant cost savings in the order of $80k.		1	

No	Scenario	AE?		Comments
		Yes	No	
69	A contractor engaged by VIHA to undertake work outside the scope of the alliance worked extensively with the alliance to agree a series of critical interface milestones. Well into the delivery phase, the contractor fails to meet one of these milestones, delaying some part of the alliance works. The alliance incurs additional costs in the order of $500k as a result. [Note - at the workshop we will discuss the situation where the alliance fails to meet the agreed milestones and the external contractor has a claim against VIHA.]		1	Regarding the situation where the alliance failure causes the contractor to incur extra costs… still a shared risk, but impact occurs through increased Owner Alliance Costs
70	After extensive discussions with the insurance market during the Alliance Development Phase, indicative quotes and policy wording for a suitable Professional Indemnity (PI) policy are obtained prior to submission of the Project Proposal. Accordingly the TOC is based on expectations (about cover, deductible, etc.) for what can be procured on the insurance market. After the alliance is underway it turns out that the terms of the best deal available in the market are significantly worse/better than what was used as the basis for the TOC, leaving the Alliance Participants exposed to significantly higher/lower uninsured risks than expected.		1	

SCHEDULE 18
KRA PLAN

KRA no.	Document Name	Date Endorsed by ALT
KRA #1	Scheduling Commissioning KRA Plan (PAA Execution) - ALT Endorsement Submission	August 23 2022
KRA#2	Key User Satisfaction KRA Plan (PAA Execution) - ALT Endorsement Submission	August 23 2022
KRA#3	Design Elements Outcomes KRA Plan v7 (PAA Execution) - ALT Endorsement Submission	August 23 2022
KRA#4	Whole of Life and Environmental Sustainability KRA Plan (PAA Execution) - ALT Endorsement Submission	August 23 2022
KRA#5	Community Benefits KRA Plan (PAA Execution) - ALT Endorsement Submission	August 23 2022
KRA#6	Health of Alliance	September 1 2022

Schedule & Commissioning

KRA Overall Weighting: 2**0%** Potential Value: +/- **$4,632,413**

KRA Champion:

KPI 1 – Schedule

KPI Weighting: Potential Value: +/-

What does this mean?

The schedule KRA Minimum Condition of Satisfaction (MCOS) is defined as achieving the project substantial completion on the date agreed upon in the baseline master schedule. For the schedule KRA, substantial completion is defined as per the below updated PAA (updates in parentheses). This not only includes the remaining work calculation but also that the project is fit for its intended use. The alliance will review the outstanding work required and collaboratively decide if this definition is met – the basis of the review will be what deficiencies remain unresolved / that remain incomplete.

The schedule KRA will be tracked against the baseline schedule throughout the project but will only be measured against the final substantial completion date.
Substantial Completion means that stage in the performance of the Alliance Works when:

- the Alliance Works are complete except for minor omissions and minor Defects which the ALT determines:
    - do not prevent the Alliance Works from being reasonably capable of being used for their intended purpose; and
    - the rectification of which will not adversely affect the safe and convenient use or operation of the Alliance Works.
- the requirements of the Specification required to be satisfied, complied with or completed prior to or as a precondition of Substantial Completion have been satisfied, complied with or completed.
- the requirements of all relevant certifying and permitting authorities in respect of the Alliance Works that are required to be provided prior to or as a precondition of Substantial Completion have been met.
- the benefit of all material or substantial Subcontracts essential for the use, operation and maintenance of the Alliance Works have been assigned, or otherwise transferred, to the Owner, so that the Owner may exercise all rights under the Subcontract on and from Substantial Completion in the manner required by Section 9.9.3.
- all documents and other information associated with the Alliance Works and essential for all use, operation and maintenance of the Alliance Works, including standard operating procedures, unit process guidelines, operations and maintenance manuals, and technical design data have been supplied to, and accepted by, the ALT.
- all operations and maintenance training and inductions have been performed and training manuals and materials are complete in order to enable the Owner to operate the Alliance Works; and
- The Financial Auditor has certified that substantial performance of the Alliance Works under the BLA has been achieved.

How is this measured?

- MCOS – Substantial Completion Date – No Pain / No Gain
- behind agreed to Substantial Completion Date – Maximum Pain Share -100. An

users.
- ahead of agreed to Substantial Completion Date – Maximum Gain Share +100.

What can you do?

- Schedule updates and forecasting will be completed monthly. If the project schedule is trending behind schedule, develop and implement mitigation strategies to limit impact of schedule slippage on Substantial Completion date. The use of the Last Planner lean construction technique will be implemented as a means to ensure schedule ownership is passed down from the Alliance to the wider project team. The benefit of the Last Planner technique is the involvement, commitment and accountability from all parties contributing to the development and adherence to the project schedule. If schedule activities slip because of lack of productivity, lack of resources or shortage of materials, the parties involved in managing and adhering to the schedule can quickly identify opportunities to recoup schedule loss by replanning the affected activities, adjusting resource requirements, considering double shifting or working overtime…this is done in an informed manner with real time feedback from the field supervision team on how much is being completed as compared to what is expected to be complete.
- Identify opportunities for schedule improvement and implement strategies to improve on schedule duration and Substantial Completion date. The baseline schedule has been developed with limited input from the subcontractors. Post PAA signing we will be engaging closely with our subcontractor partners to refine and validate our plan and schedule. The engagement with our sub trade partners and further confirmations on availability of resources may present opportunities to improve the project schedule by permitting more overlapping of activities which are currently staggered to avoid task stacking and resource over commitment.

KPI 2 – Commissioning

KPI Weighting Potential Value: +/-

What does this mean?

The commissioning KRA Minimum Condition of Satisfaction (MCOS) is defined as achieving substantial commissioning at two months post project substantial completion as agreed upon in the baseline master schedule. For the commissioning KRA, substantial commissioning is defined below. The Alliance will review the outstanding commissioning work required and collaboratively decide if this definition is met - the basis of the review will be the list of commissioning tests that remain incomplete. The commissioning KRA will be tracked against the baseline schedule throughout the project but will only be measured against the final substantial commissioning date.

Substantial Commissioning means that stage in the performance of the Alliance Works when:

- the Alliance Works are complete except for minor omissions and minor Defects which the ALT determines:
    - do not prevent the Alliance Works from being reasonably capable of being used for their intended purpose; and
    - the rectification of which will not adversely affect the safe and convenient use or operation of the Alliance Works.
- the ALT determines that all inspections, testing, verification, commissioning and certifications that are functionally required as identified in the approved commissioning plan are to be completed at the time of substantial completion. The approved commissioning plan will be developed by the Alliance after the PAA is executed. The approved commissioning plan will set out a realistic plan for the building systems that are to be fully commissioned at substantial completion and which systems will require finalization post substantial completion (due to seasonal requirements or building occupancy requirements – for example systems that require a load from the building occupants such as systems serving the MDRD department that require medical equipment reprocessing for verification and adjustment). At this point in time it is too early to define what constitutes a substantially commissioned facility as we have not started detailed design nor settled on all of the building systems. The Alliance will define the Commissioning plan in concert with the Commissioning Authority and Commissioning Provider and members of the wider project team such as the mechanical and electrical design consultants and the mechanical and electrical subcontractors and their respective suppliers and sub subcontractors.

- the requirements of the Specification required to be satisfied, complied with or completed prior to or as a precondition of Substantial Completion have been satisfied, complied with or completed.
- the requirements of all relevant certifying and permitting authorities in respect of the Alliance Works that are required to be provided prior to or as a precondition of Substantial Completion have been met.
- the benefit of all material or substantial Subcontracts essential for the use, operation and maintenance of the Alliance Works have been assigned, or otherwise transferred, to the Owner, so that the Owner may exercise all rights under the Subcontract on and from Substantial Completion in the manner required by Section 9.9.3.
- all documents and other information associated with the Alliance Works and essential for all use, operation and maintenance of the Alliance Works, including standard operating procedures, unit process guidelines, operations and maintenance manuals, and technical design data have been supplied to, and accepted by, the ALT; There will be some supplemental reports provided after substantial completion that will document commissioning completed post substantial completion due to seasonal or building occupancy requirements.
- all operations and maintenance training and inductions have been performed and training manuals and materials are complete in order to enable the Owner to operate the Alliance Works.

At Substantial Commissioning, systems and features are to function to meet their intended use. Further debugging and tuning are still to be performed after substantial commissioning as well as seasonal or post occupancy installations and systems requiring load. For example, an adjustment to the building air balancing is expected to be necessary once the building occupant load increases and use of the facility begins; other examples include the cooling system, capacitor banks, food service equipment and associated exhaust systems. All training and documentation required to operate and maintain the base building systems and infrastructure are delivered before activation. It is expected that minor deficiencies that may not be corrected at substantial commissioning. However, the correction of these deficiencies will not impact the training nor activation of the facility.

How is this measured?

- MCOS – Substantial Commissioning Date post substantial completion) – No Pain / No Gain
- behind agreed to Substantial Commissioning Date – Maximum Pain Share -100.
- ahead of agreed to Substantial Commissioning Date Maximum Gain Share +100.

What can you do?

- Schedule updates and forecasting will be completed monthly. If the project schedule is trending behind schedule, develop and implement mitigation strategies to limit impact of schedule slippage on Substantial Completion date. The use of the Last Planner lean construction technique will be implemented as a means to ensure schedule ownership is passed down from

the Alliance to the wider project team. The benefit of the Last Planner technique is the involvement, commitment and accountability from all parties contributing to the development and adherence to the project schedule. If schedule activities slip because of lack of productivity, lack of resources or shortage of materials, the parties involved in managing and adhering to the schedule can quickly identify opportunities to recoup schedule loss by replanning the affected activities, adjusting resource requirements, considering double shifting or working overtime…this is done in an informed manner with real time feedback from the field supervision team on how much is being completed as compared to what is expected to be complete.

- Identify opportunities for schedule improvement and implement strategies to improve on schedule duration and Substantial Completion date. The baseline schedule has been developed with limited input from the subcontractors. Post PAA signing we will be engaging closely with our subcontractor partners to refine and validate our plan and schedule. The engagement with our sub-trade partners and further confirmations on availability of resources may present opportunities to improve the project schedule by permitting more overlapping of activities which are currently staggered to avoid task stacking and resource over commitment.

Alliance Leadership Team (ALT) Endorsement

ALT Member	Signature

Key User Satisfaction

KRA Overall %: **15%**

Potential Value: **$3,474,310**

AMT Champion

ALT Champion:

Objectives:

- KPI 1 - Clinical and patient stakeholders feel they were adequately engaged through design and construction.
- KPI 2 - First Nations, Metis, and Indigenous people feel they were adequately engaged through the design and construction of indigenous related objectives.

KPI 1 – Clinical and patient stakeholders feel they were adequately engaged through design and construction.

KPI Weighting: of KRA

Potential Value:

What does this mean?

Through User Group engagement sessions, the objective to KPI 1 is confirmation that Clinical & Patient stakeholders feel that they were adequately engaged through Design and Construction. Satisfaction surveys (to be developed in collaboration with an external Survey Consultant) will be used as a tool, and focus on eliciting Clinical & Patient engagement experiences associated with:

- were they adequately engaged through design and construction.
- was their input addressed appropriately by informing the design and / or offered feedback as to whether their requests were outside the Schedule of Requirements and how it may negatively impact other aspects of the design / functionality of the Hospital.
- were the engagement processes respectful of their time, effort, uniqueness and expertise.

The AMT will be accountable for, and in consultation with an external Survey Consultant, responsible for establishing resources associated with data collection, interpretation, and distribution of survey / KPI results.

Surveys will require approval from Islands Health Executive Steering Committee before being finalized as part of the KRA Management Plan.

How is this measured?

Pain Share	Mid Fail	MCOS	Mid Gain	Gain Share
satisfaction	Satisfaction	Satisfaction	Satisfaction	Satisfaction

Measurement Frequency (to be finalized and confirmed with an external survey consultant) Feedback will be requested through surveys at the end of each design period: Schematic Design (SD), Design

Development#1 (DD), and DD #2, during the Mock up Process and during the Construction phase. We expect the engagement of clinical stakeholders to be most intense through the design process until the end of 2023, but engagement will continue for the duration of the Alliance.

Methodology (to be finalized and confirmed with an external survey consultant)

The survey will utilize a 1–10-point scale. 1 being totally unsatisfied and 10 being totally satisfied. A score of 5 would be neutral neither satisfied nor unsatisfied.

- The scoring will be calculated by averaging all the scores from each survey completed throughout the Alliance.
- Response rate for validity of the survey will be identified with the expert survey consultant.
- The number of survey participants may be approximately 300 to 400 individuals
- There will also be a qualitative component to the survey questions to inform the reflect and correct process.

Process (to be finalized and confirmed with an external survey consultant).

- Surveys will be administered at the end of a user group meeting. Participants will be given time to complete the survey during the specific session and / or an opportunity to complete later in time if required.
- Paper, online or app surveys are proposed for each individual attending. The following are steps in the process:
  - As the formal survey times approach a segment of the user meetings will be used to discuss the upcoming survey goals and processes.
  - Surveys will be issued electronically and by paper if required.
  - A reasonable time frame for completion will be provided to groups with notifications sent as reminders
  - Information will be collated and summarized
  - Results will be distributed to the AMT for discussion and user group leaders for reflection and action on how to improve the process
  - Results will be distributed with participants

Other forms of user feedback, engagement and considerations are:

- Reflect and correct discussion during meetings
- Engagement focus will shift as the project progresses from the design period to equipment procurement and IMIT engagement, then to operational readiness and operational commissioning.

KPI 2 – KPI GOAL- First Nation, Metis, and Indigenous people feel they were adequately engaged through design and construction of Indigenous related objectives.

KPI Weighting: of KRA Potential Value: +/-

How is this measured?

Pain Share	Mid Fail	MCOS	Mid Gain	Gain Share
satisfaction	Satisfaction	Satisfaction	Satisfaction	Satisfaction

What does this mean?

Through User Group engagement sessions, the objective to KPI2 is confirmation that First Nation, Metis and Indigenous rightsholders, including but not limited to Indigenous Advisory Counsel (IAC), Project Advisory Committee (PAC), Indigenous Island Health Staff, Indigenous Patient Partners and Community Elders feel that they were adequately engaged through Design and Construction. Satisfaction surveys (to be developed in collaboration with an external Survey Consultant) will be used as a tool, and focus on eliciting First Nation, Metis and Indigenous Rightholders' engagement experience associated with:

- were they adequately engaged through design and construction.
- was their input addressed appropriately by informing the design and / or offered feedback as to whether their requests were outside the Schedule of Requirements and how it may negatively impact other aspects of the design / functionality of the Hospital.
- were the engagement processes respectful of their time, effort, uniqueness and expertise.

The Indigenous engagement process is to be developed with expert consultation, including an external Survey Consultant, Project Advisory Committee and Cowichan Tribes. Engagement for the Indigenous Satisfaction must be tailored to meet the indigenous needs and traditions.

Meaningful Engagement with First Nations, Metis and Indigenous people will be reflected in a culturally safe design that is welcoming and demonstrates the local art and architecture.

Engagement with First Nations, Indigenous and Metis will be free of stigma, racism and any association to the legacy of Indian Hospitals.

The AMT will be accountable for, and in consultation with an external Survey Consultant, responsible for establishing resources for data collection, interpretation, and distribution of survey / KPI results.

Surveys will require approval from Islands Health Executive Steering Committee as well as input & feedback from the PAC before being finalized as part of the KRA Management Plan.

Measurement Frequency (to be finalized and confirmed with an external survey consultant) Feedback will be requested through surveys the end of each design period: Schematic Design (SD), Design Development#1 (DD), and DD #2, during the Mock up Process and during the Construction phase.

Methodology (to be finalized and confirmed with an external survey consultant) Interviews and oral feedback are the preferred method of obtaining feedback. This could be done through an unbiased team member or another individual. If required paper, online or app surveys are proposed for each individual attending as well to supplement oral feedback. The following are steps in the process:

- The scoring will be calculated by averaging all the scores from each survey completed throughout the Alliance.
- As the formal survey times approach a segment of the user meetings will be used to discuss the upcoming survey goals and processes.
- A reasonable time frame for completion will be provided to groups with notifications sent as reminders
- Results will be distributed to the AMT for discussion and user group leaders for reflection and action on how to improve the process.
- Results will be distributed with participants

Process (to be finalized and confirmed with an external survey consultant).

- Surveys will be administered at the end of a user group meeting. Participants will be given time to complete the survey during the specific session and / or an opportunity to complete later in time if required.
- Although oral feedback seems to be the preference, paper, online or app surveys could be used as an alternative means. The following are steps in the process:
  - As the formal survey times approach a segment of the user meetings will be used to discuss the upcoming survey goals and processes.
  - A reasonable time frame for completion will be provided to groups with notifications sent as reminders
  - Information will be collated and summarized
  - Results will be distributed to the AMT for discussion and user group leaders for reflection and action on how to improve the process
  - Results will be distributed with participants

Alliance Leadership Team (ALT) Endorsement

ALT Member	Signature

Design Elements Outcomes

KRA Overall Weighting: **15%** Potential Value: **$3,474,310**

KRA Champion:

Objectives:

- Enhance patient, operational, and infrastructure outcomes through optimal Design Elements in the following categories:
  - Operational Innovations
  - Indigenous Representation and Inclusion
  - Healing Environment
  - Cowichan District Hospital Future Vision

KPI 1 – Achievement of Design Elements Outcomes

KPI Weighting: **15%** of KRA Potential Value: **$3,474,310**

What does this mean?

ACHIEVEMENT OF THE SAME SCORE ON AS-BUILT DRAWINGS AS ACHIEVED AT THE PROJECT PROPOSAL EVALUATION

- MCOS is set at the Weighted Score that was achieved at the original evaluation
- As built drawings will be evaluated using the same methodology as applied to the original evaluation
  - Evaluation advisors from the Alliance will review the as built drawings and without needing consensus each advisor will determine a score
  - The ALT will review the materials, feedback, and range of scores from the evaluation advisors and will reach a consensus score
  - Gain/Pain share will be determined
- Evaluation Advisors will consist of owner and non-owner personnel from the following roles:

Operational Innovations	Indigenous Representation and Inclusion	Healing Environment	Cowichan District Hospital Future Vision
Clinical Director	Director – Indigenous Engagement	Clinical Director	Director – Design & Construction
Medical Director	Director – Indigenous Health	Medical Director	Clinical Manager
Clinical Manager	Project Advisor – Indigenous Engagement	Clinical Manager	Director – Indigenous Engagement
Infection Control Specialist	BCIB Representative	Infection Control Specialist	Construction Manager
Safety Advisor	Architect	Safety Advisor	Mechanical/Electrical
Medical Provider Engagement	Interior Designer	Medical Provider Engagement	Civil
Biomedical Engineer	Landscape Architect	Biomedical Engineer	Architect/Structural

Lead – People, projects, initiatives		Lead – People, projects, initiatives	Landscape Architect
Architect		Architect	
Interior Designer		Interior Designer	
Socio-Economic Development Specialist		Landscape Architect	

How is this measured? (Points based)

Pain Share from MCOS

MCOS (evaluation value) Achievement

Gain Share from MCOS

Guiding Principles

- Where possible, design changes will take into consideration the impact on design elements outcomes and mitigated as appropriate without compromising good design
- Based on original scoring/ feedback – team will review categories for significant improvement opportunities and seek opportunities to understand and produce focused positive outcomes. E.g. Safety/ Security sub category of healing environment scored Focused attention to this area could have a significant scoring improvement and particular needed to not drop in this area
    - Specific groups may be formed to examine addition opportunities to improve design e.g. GBA+, Diverse Workforce, Cultural Safety, Accessibility
- Design element focused meetings will be conducted by Design/ Clinical Team to review designs, feedback, tracking of proposed changes and alignment/impact to design elements outcomes throughout the life-cycle of the project
    - Meetings will be scheduled at the following intervals during each phase of the design process
        - Midpoint through SD and 1 week prior to end of SD
        - Monthly during DD1 and DD2
        - minimum of every 2 months throughout the remainder of the project
    - A review checklist for each category of design elements will be utilized to guide gathering and documenting feedback along all phases of design confirmation

- Sample rescoring of design element measure will occur as a minimum at the intervals listed and as determined by Alliance team to assess cumulative impact of changes across categories, to note trending of overall score and allow adjustments based on findings
    - Start and Midpoint of DD1 and DD2
    - Every 3 months during construction phase
    - A progressive scorecard will be utilized to document rescoring
- The evaluation criteria and report compiled for the procurement evaluation will be used as the baseline for all rescoring activities
- A process for the AMT to agree on any design changes that have a significant impact on the design elements outcomes (as compared to the baseline score developed from the evaluation of the ADP RFP submission) is proposed as:
    - In the event that a proposed design change may have a significant impact on achieving design elements outcomes, these will be reported to the AMT where they will be reviewed/approved and endorsed by the ALT
    - The ALT will inform the Alliance evaluation advisors of any design elements to be excluded from the scoring process at the time of evaluation
        - Example: Change made to drop off zone for ED – improves patient flow to department and safety – impacts future vision of ED expansion plan

Alliance Leadership Team (ALT) Endorsement

ALT Member	Signature

Facility Maintenance and Environmental Sustainability Outcomes

KRA Overall Weighting: **15%** Potential Value: +/- **$3,474,310**

KRA Champion:

Objectives:

- Design and construction teams have a consideration for:
  - Maintenance & Lifecycle Cost for asset management, and organizational and operational costs
  - Minimize GreenHouse Gas emissions,
  - Maximize Energy Efficiency

KPI 1 – Maintenance and Lifecycle Cost

KPI Weighting: of KRA Potential Value: +/-

What does this mean?

Maintenance and Lifecycle cost is defined here as the total maintenance, refurbishment, and replacement expense of all maintainable assets over the assessed project life cycle (I.E., 30 years, per 'Attachment 2P-1 Maintenance and Lifecycle Template'). While "whole of life" or "net present value" models typically include a project's capital expenses, cost indexation and cost of capital assumptions, this KPI will compute maintenance and lifecycle costs on a real dollar basis over the 30 year assessed term. Thus, this KPI will specifically evaluate the design's impact on lifecycle and maintenance costs, as defined in Appendix 2P of Schedule 2. The intent of the KPI is to incentivize design decisions that reduce the ongoing maintenance and lifecycle costs of the building during the operations phase.

Note: real dollar terminology is to describe the absence of inflation / indexation or discount factor assumptions in the 30 year forecast totals. The maintenance & lifecycle cost totals will always be presented in base date dollars (i.e. 60 days post PAA execution), with no indexation or discount applied.

- The Maintenance and Lifecycle Costs will be calculated as the sum of the annual maintenance cost estimates over a 30 year period. This calculation is a requirement of Schedule 2 and the template Model is included in Appendix 2P (Attachment 2P-1). This Model, and thus the KPI, includes only the Maintenance and Lifecycle Cost incurred during the operational phases and excludes upfront capital expenses and other operational (e.g. energy consumption) costs; capital and energy consumption are addressed in other KRAs / KPIs and other operating costs are impacted much less by design.
- Without factoring cost escalation or discount rate assumptions the Maintenance and Lifecycle Cost will be expressed in Real Dollars, from the date of the first 'ATTACHMENT 2P-1 MAINTENANCE AND LIFECYCLE TEMPLATE' submission [i.e. 60 days post PAA execution]. When subsequent models are submitted, they will be de-escalated (CPI BC from month of initial 2P-1 submission) to preserve consistency of comparability of Maintenance and Lifecycle Costs.
- Per the Project Agreement, "a Baseline Maintenance and Lifecycle Cost Model ("Baseline Model") shall be submitted within 60 days of PAA Execution". ED+P shall draft the models; VIHA

AFM advisors (Altus) shall review models (maintenance and lifecycle data, assumptions, standards applied etc.) and provide feedback to ED+P. The Alliance will negotiate any anomalies, inconsistencies etc. and agree on Baseline Model inputs, and submit the agreed MCOS (NPC) to ALT.

- Inputs to the Baseline Model that will require consensus on by the Alliance include but are not limited to:
    - Systems and equipment types;
    - Asset quantities;
    - Design Life of each asset;
    - Replacement % and Costs;
    - Maintenance labour effort;
    - Maintenance Costs; etc
- The Maintenance and Lifecycle Cost Model is required to be continuously updated throughout the project's design and construction phases, per Schedule 2 item 9.16.14, which will allow the KPI to be continuously tracked. Revisions to the Model will include design revisions made specifically to optimize Maintenance and Lifecycle Costs as agreed upon by the Alliance, relative to the Baseline Model.
- A final Model is required to be submitted 6 months prior to Substantial Performance per Schedule 2, thus closure/final performance of the KPI will be defined prior to the project's completion. This final Model will represent the construction document / built conditions and will be compared against the Schematic Design conditions set in the Baseline Model.
- Success of this KPI will be based on the Alliance's ability to optimize the project's Maintenance and Lifecycle Costs by demonstrating quantifiable savings related to design decisions.

How is this measured? (Points based)

Pain Share

from MCOS

MCOS
Baseline
Maintenance and
Lifecycle Cost (MLC)

Gain Share

from MCOS

Guiding Principles

- Improvements to the Maintenance and Lifecycle costs will be realized through:
    - the use of innovative technologies and strategies that offer a fundamental improvement (lower) in the operational costs of the facility (e.g. use of sensors and analytics to optimize maintenance interventions and expenses);
    - the thoughtful selection of materials and equipment (e.g. increasing the capital expense for a certain product that requires less overall maintenance, thus offering lifecycle cost savings);

    - strategic maintenance model planning (e.g. decisions on when to perform preventative maintenance or run a product to failure, or when to perform maintenance in-house vs using outsourced contracts)
- Baseline Model calculations will utilize building component data and quantity take-offs that best represent the Schematic Design documents, as not all specific asset information will be fully defined or established in early Design Development. The Alliance will review and collectively agree on the assumptions used for equipment types, quantities, lifecycles, maintenance-cycles and costs and other such considerations that best represent the anticipated design elements.
- Discussion was given to the use of a Real Dollar calculation vs traditional "Whole of Life" or "Net Present Cost" calculations, that take not only capital expenditures but also indexed financial inputs, specifically discount and inflation & non discounted rates. Due to the volatility of these inputs at PAA Execution, it is proposed that non-indexed Facility Maintenance / Lifecycle Cost (or "Real Dollar") inputs be utilized to eliminate the influence of uncontrollable financial/market forces and factors. The Model will express the Maintenance and Lifecycle Cost in Real Dollars at the 2022 date of Baseline Model submission.
- The final model submission will use the CPI BC Stats Canada index to adjust for price escalation realized through the design and construction period (i.e. real inflation will be used to adjust the Baseline and the Final Model Real Dollar costs).
- Maintenance and Lifecycle Cost Model updates will exclude unforeseen changes to the design (i.e. adjustments the design elements and quantities based on assumptions made in the Baseline Model). This will keep revisions to the model indicative of the Facilities Maintenance and Operations team's input on the Alliance's design and maintenance model decisions as well as what is within their scope and influence on the project.
- The standard for reduction target has been identified as Maintenance and Lifecycle Cost delta throughout design, from ED+P's PPP comparator project examples. The Alliance proposes as the target delta, factoring differing approaches to design evolution with the Alliance model.
- Per Schedule 2, the Model must be updated and aligned with the submission of the draft asset register 3 months following completion of major architectural and engineering design packages. This allows the evolution of the Model and KPI performance to be regularly benchmarked.
- There will be regular FM meetings to discuss maintenance strategies, with smaller studies and model updates as required. If KPI performance is not being met, additional iterations to the Model and updates may be used to iteratively inform and update the FM and design teams.

KPI 2 – Environmental Sustainability - Operational Energy Use Intensity

KPI Weighting: of KRA Potential Value: +/-

What does this mean?

The Energy efficiency of a facility has a direct impact on that facility's operation (utility) costs, taxes/levies (e.g. carbon taxes), and overall environmental impact. This KPI seeks to minimize the facility's energy use, specifically using energy modeling software to predict and iteratively optimize the systems and equipment selected during design and construction.

- The project will be using energy modeling software to evaluate and inform and optimize design decisions that impact capital cost and operational energy consumption (e.g. what is the most

appropriate R-value of walls and roofs?). Energy modeling is required for LEED certification, Zero Carbon Design certification, and by the Province's Building Code.

- To benchmark the project's anticipated energy consumption the total energy used is divided by the building's floor area and expressed as "Total Energy Use Intensity", or TEUI, measured in ekWH/m^2/year.
- Energy modeling has already been completed during the pursuit phase and will be continuously updated throughout the project. A final energy model (used for submission to the Province and the CaGBC) will undergo a 3rd party peer review. This allows the KPI to be continuously tracked, and closure/final performance being easily defined prior to the project's completion.
- Success of this KPI will be based on the Alliance's ability to minimize the building's TEUI.

How is this measured? (Points based)

Pain Share MCOS Gain Share

TEUI

MCOS MCOS

Guiding Principles

- MCOS is set at the modeled TEUI from ED+P's Design Submission. This TEUI also aligns with achievement of points and EUI of indicative design energy model, both of which are stated in Schedule 2 as criteria for the Alliance to achieve.
- TEUI is used instead of overall energy usage (ekWh) as an Intensity expressed on a per m^2 basis eliminates the sensitivity of the KPI to changes in program area throughout DD.
- Gain Share stretch target represents upper end of high performance acute care hospitals, based on the Alliance team's experience on other comparable projects and publicly available data. Pain Share threshold represents the typical existing West Coast hospital EUI.
- Modest deviations from the proposed (in design submission) energy conservation measures (ECMs) will have a detrimental effect on the TEUI; this incentivizes the Alliance to maintain all proposed ECMs in the design.
- Additional measures ECMs to pursue during design: refining BMS/controls sequences, exploring alternative humidification set points, careful review and critique of equipment data / shop drawings, and exploring reduction in process loads. Overall size of the PV system selected will impact overall performance as well.
- KPI will be tracked every time an energy model update is completed throughout design, with frequent updates as design evolves or opportunities/threats to performance are reviewed. If KPI performance is not being met during design, additional iterations to the model and updates may be used to iteratively inform and update the design team.

- Once design is set, the risk of reduced TEUI shifts to equipment selection. Key shop drawings will be reviewed by the energy modeler to validate performance criteria, screen equipment that may compromise targets.
- A final energy model is completed, and success of the KPI is assessed, once all key equipment and materials have validated performance data (via approved shop drawings). This typically occurs when construction progress is at approximately 70% complete. This energy model is validated by a 3rd party energy modeler during submission to the Province and CaGBC.

KPI 3 – Environmental Sustainability - Operational Greenhouse Gas Emissions

KPI Weighting: of KRA Potential Value: +/

What does this mean?

The Greenhouse Gases emitted by a building on an annual basis form a significant portion of it's environmental footprint, and also impacts ongoing carbon tax rates. While optimizing Energy efficiency (KPI 2) of a facility is closely linked to the carbon emissions of a building, decisions on the types and sources of energy also greatly impact the building's "carbon footprint". This KPI seeks to minimize the facility's operational greenhouse gas (GHG) emissions, specifically using energy modeling software to predict and iteratively optimize the systems and equipment selected as well as the energy sources required to operate them.

- The project will be using energy modeling software to evaluate and inform and optimize design decisions that impact GHG emissions (e.g. what is the impact of using natural gas vs electric-powered hot water heaters on emissions?). Energy modeling is required for LEED certification, Zero Carbon Design certification, and by the Province's Building Code.
- To benchmark the project's anticipated GHG emissions, energy consumption from each fuel source is multiplied by published GHG emissions factors based on geographic area. GHG emissions of various types (e.g. methane, COx, NOx, etc) are normalized and expressed as equivalent tonnes of carbon and divided by the building's floor area, or kgCO2e/m^2/year.
- Energy modeling has already been completed during the pursuit phase and will be continuously updated throughout the project. A final energy model (used for submission to the Province and the CaGBC) will undergo a 3rd party peer review. This allows the KPI to be continuously tracked, and closure/final performance being easily defined prior to the project's completion.
- Success of this KPI will be based on the Alliance's ability to minimize the building's GHG emissions.

How is this measured? (Points based)

Pain Share

MCOS Gain Share

GHG year
emissions

Guiding Principles

- Schedule 2 identifies an in GHG over the existing facility , which is set at Pain share. Pain share represents a transitionary level of GHG reduction where loads are converting to natural gas, which has an emission factor >16x that of electricity. As the GHG emissions are sensitive both to the GHG emission factors of the fuel types used (high sensitivity) and the changes to the design and equipment selection (lower sensitivity), the KPI scale is non-linear. The gainshare side represents the incremental positive improvements in design and material selections, and the pain share side represents the first incremental deterioration in design and material selections combined with conversion of plant equipment from electric to natural gas.
- MCOS is set at which aligns with the proposed (submission) design calculation. This also exceeds the targeted in current CDH Greenhouse Gas (GHG) emissions.
- Gain Share stretch target represents upper end of high performance acute care hospitals, based on the Alliance team's experience on other comparable projects and publicly available data. Pain Share threshold represents the typical existing West Coast hospital EUI and all electric building.
- GHG Emissions are expressed as an Intensity (i.e. a per m^2 basis) in lieu of an absolute value which eliminates the sensitivity of the KPI to changes in program area throughout DD.
- KPI will be tracked every time an energy model update is completed throughout design, with frequent updates as design evolves or opportunities/threats to performance are reviewed. If KPI performance is not being met during design, additional iterations to the model and updates may be used to iteratively inform and update the design team.
- Once design is set, the risk of higher GHG emissions shifts to materials and equipment selection. Key shop drawings will be reviewed by the energy modeler to validate performance criteria, screen equipment that may compromise targets.
- A final energy model is completed, and success of the KPI is assessed, once all key equipment and materials have validated performance data (via approved shop drawings). This typically occurs when construction progress is at approximately 70% complete. This energy model is validated by a 3rd party energy modeler during submission to the Province and CaGBC.

KPI 4 – Environmental Sustainability - Embodied Greenhouse Gas Emissions

KPI Weighting: of KRA Potential Value: +/-

What does this mean?

The Greenhouse Gases emissions from constructing a building are calculated using a Lifecycle Analysis (LCA), and are expressed as an absolute, one time GHG emission value, typically referred to a building's "carbon footprint". This analysis totals the estimated GHG emissions resulting from harvesting and transporting the building's raw materials,

AS WELL AS ALL EMISSIONS FROM THE MANUFACTURING PROCESSES. THIS KPI SEEKS TO MINIMIZE THE FACILITY'S EMBODIED GHG EMISSIONS (CARBON FOOTPRINT) FROM DESIGN AND CONSTRUCTION THROUGH THE STRATEGIC SPECIFICATION AND SELECTION OF BUILDING COMPONENTS AND MATERIALS.

- The project will be using LCA software to evaluate and inform and optimize design decisions that impact embodied GHG emissions (e.g. what type of roof insulation has the least environmental impact / carbon footprint?). LCA is required by Schedule 2 as part of the LEED certification strategy, and is a mandatory component of Zero Carbon Design certification.
- Embodied GHG emissions are a one time impact that represent a distinct life cycle of the project (from raw material extraction to installation, but not operations or disposal). Thus embodied GHG emissions will be calculated as an absolute value, but benchmarked, normalized, and evaluated as a KPI as an intensity, with equivalent tones of carbon and divided by the building's floor area, or $kgCO2e/m^2$.
- While preliminary LCA has been completed to inform and guide design choices, a more detailed LCA will be completed with different software once design is further advanced. The KPI will be tracked and assessed using the to-be-completed LCA, which will provide a more granular and detailed analysis of the project's GHG emissions.
- The LCA will be continuously updated as design is completed and as material selections are reviewed. This allows the KPI to be continuously tracked. A final LCA will be submitted to the CaGBC as part of the LEED and Zero Carbon Design certifications, and will undergo a 3rd party peer review for validation, allowing closure/final KPI performance to be defined prior to the project's completion.
- Success of this KPI will be based on the Alliance's ability to minimize the building's embodied GHG emissions.
- Performance will be evaluated based on % reduction in GHG emissions rather than an absolute number. This is a standard method for evaluating a project's performance as absolute values are closely tied to project size, location, operational needs, and other design criteria beyond the scope of LCA discussions or influence.
- This Baseline (and MCOS) will be calculated during DD when the design has sufficiency developed for the proposed Lifecycle Analysis software to be used. Preliminary modeling suggests a GHGI Baseline of and a MCOS of however we anticipate the Baseline and MCOS will decrease when detailed LCA baseline calculations are performed.
- GHG emissions/analysis of the proposed building design will be refined and recalculated at the end of CD using the same LCA software.
- Success of this KPI will be based on the Alliance's ability to minimize the building's embodied GHG emissions.

How is this measured? (Points based)

Pain Share

reduction
from MCOS

MCOS

from

Baseline

Gain Share

reduction
from MCOS

Guiding Principles

- During the pursuit, VIHA noted that a MCOS for LCA was a from Baseline, which we propose is the threshold, and that the MCOS be set at a based on preliminary LCA and anticipated savings. LEED points for LCA reduction are maximized at which is the proposed threshold. Maximum gain share is set which exceeds the LEED "Innovation" threshold for embodied GHG reductions in the CaGBC Zero Carbon Building Design standard and exceeds the requirements for maximizing the number of LEED Building Design and Construction points for LCA and embodied carbon reduction. A reduction of greater than GHG would be a "best in class" result.
- Standard LCAs require analysis of just structural and envelope components (namely concrete, steel, and insulation). To achieve best in class savings the Alliance will expand the scope of analysis to include interior finishes as well. This analysis will maximize transparency, one of the goals of LCA, and will help minimize the project's embodied carbon while not jeopardizing other aspects of Schedule 2.
- The LCA will be continuously updated throughout DD and CD, which will allow the KPI to be continuously tracked. More frequent updates and checks on KPI performance will be completed as structural elements are sourced (specifically concrete and steel) and finishes specifications are finalized. If KPI performance is not being met, additional iterations to the LCA model may be used to iteratively inform and update the design team and suppliers.
- The LCA model (and ultimate reductions from Baseline) will be finalized once all of the project's material selections have been selected and verified with manufacturer's data sheets and Environmental Product Declarations. The LCA will be 3rd party verified by the CaGBC as part of the LEED and Zero Carbon Design submissions, which will be utilized to finalize KPI performance.

Alliance Leadership Team (ALT) Endorsement

ALT Member	Signature

Community Benefits

KRA Overall Weighting: 20% Potential Value: +/-**$4,632,413**

KRA Champion:

Objectives:

- Facilitate and optimize the supply of a diverse, skilled, and safe workforce.
- Creation of career development opportunities to grow a diverse and local trade and professional workforce.
- Growing job opportunities for Apprentices and Trainees.

KPI 1 – Forecast

KPI Weighting: of KRA Potential Value: +/-

What does this mean?

The community benefits labour forecasting MCOS is defined as achieving an labour forecast between the 3 month forecast and the 30 day request. Through the collaborative workshops it was discussed that from 3 months out the Alliance should have a very good idea of the amount and skill set requirements of the labour force. An rate reflects a realistic MCOS goal based on EllisDon and BCIB's past project experience as there are several factors that will affect the labour requirements during that period. A is almost unattainable due to the below factors but a would be considered a failure based on BCIB and EllisDon's past project experience.

The following are examples of factors that may affect the Alliance's ability to accurately forecast labour and will be taken into consideration when developing their estimates.

- Skill set of labour provided
- Work ethic of labour provided
- Weather conditions
- Unforeseen delays

*These factors will not affect the KPI scoring.

Should labour fulfillment ever create an issue that affects the forecast, the KPI score will not be negatively impacted. For clarification, if an inability to provide labour causes a labour forecast to shift or lose accuracy, the KPI scoring will not be affected which BCIB will track.

How is this measured?

Failure	Mid Failure	MCOS	Mid Gain	Gain Share
Forecast	Accurate Forecast	Forecast	Accurate Forecast	Forecast

Measurement Frequency

The labour forecasting will be tracked, and recorded on a monthly basis then reviewed by the AMT quarterly to reflect and correct as required.

The forecasting KPI tracking will begin when bulk excavation starts to allow for the process to be fine tuned during the initial site mobilization months. The start of excavation to Substantial Completion will have monthly weighting for the KPI.

Measurement Methodology

The Alliance will measure the 3 month forecast against the 30 day request at the start of every month. A labour forecast will be submitted in the middle of every month forecasting 3 months out. The request will be compared to the forecast. The KRA/KPI score will be the cumulative accuracy throughout the project. If the labour request from the previous month is not fulfilled it will not affect the labour forecast metric. The forecast will be measured based on trade delineation. See below examples:

Ex:

Ex:

Ex. The Alliance will submit a labour forecast mid January for the entire month of April. At the start of April the labour requests made in March for the month of April will be compared to the 3 month forecast submitted in mid January. This will be completed every month but quantified for KRA/KPI quarterly. See below example:

What can you do?

- Ensure the Alliance has a clear, timely and accurate view of workforce requirements and fulfillment.
- Maintain the workforce management forecast and ensure it reflects the current project schedule.
- Ongoing fully resourced schedule for forecasting and fulfillment.

KPI 2, 3 & 4 – Diverse Workforce

KPI Weighting: of KRA Potential Value: +/

What does this mean?

The Diverse Workforce (Indigenous, underrepresented Equity Groups & Local workforce) for the skilled CBA workforce and the contractual Alliance (Owner & NOPS) will be tracked together through KPI2 (Indigenous), KPI3 (underrepresented Equity Groups, as defined by the CBA) & KPI4 (Local Residents as defined by the CBA) respectively. CBA workers are defined as per the CBA Agreement (Agreement to be included as an appendices within the KRA Management Plan) and the contractual Alliance members are defined as having their positions noted on the Org Chart as full time roles within the Alliance. The fully developed Org Structure is to be included in the final KRA Management plan as an appendix.

Should any of the aforementioned 3 KPI's be consistently below MCOS and the AMT determines that all reasonable efforts have been exhausted by the Alliance to attract and recruit a workforce of Indigenous, underrepresented Equity groups and Local individuals, it will be the responsibility of the AMT to report these findings, including a proposed revised scale (MCOS) to the ALT. It will be the ALT's discretion if the MCOS, max painshare and gainshare are to be revised accordingly

The KPI Weighting and Value will be evenly split between KPIs 2, 3 and 4 at 3% each.

Indigenous: The MCOS of skilled indigenous workers is The current BCIB project average is but the Alliance believes to be a realistic but challenging target. The 2016 census data shows the Indigenous population of Vancouver Island is and in the Cowichan Valley it is With the Indigenous engagement to date on the CDHRP project we believe we can achieve higher density ratios on the project than the surrounding population.

The Community Benefits Agreement defines Indigenous as "an inclusive term referring to all First Nations, Metis, and Inuit peoples."

Equity: The MCOS of skilled Equity workers is The current BCIB project average is for Equity and youth. The MCOS is set slightly lower than the BCIB average as a hospital project requires specialized workers compared to a general project. The Alliance believes this to be a realistic but challenging target as BCIB is already striving to include as many equity workers as possible on their projects.

The Community Benefits Agreement defines Equity Group as "an inclusive term referring to women in non-traditional work, people with disabilities, and other traditionally underrepresented groups."

Local: The MCOS of skilled Local workers MCOS is The current BCIB project average is Through discussions with the sub-trades we believe o be a realistic but difficult goal to achieve. A hospital project requires specialized workers for many of the subtrade tasks. Additionally, the CDHRP project site is considered a remote location and numerous sub-trades are planning to bring specialized workers from the mainland.

The MCOS scale is based on BCIB's project average, the demographic of the island population and on EllisDon and BCIB's past project experience. The specialty work required on a hospital project versus a civil or typical project will make these targets significantly harder to achieve.

The Community Benefits Agreement defines a "Local Resident" as "a person who resides on Vancouver Island and within one hundred (100) Road Kilometres of the Site."

Note: *It is possible for an individual to be categorized under any one of, multiple or all 3 of these KPI's*

How is this measured?

Indigenous - KPI 2

Failure	Mid Failure	MCOS	Mid Gain	Gain Share
hours	Total hours	hours	hours	hours

Equity - KPI 3

Failure	Mid Failure	MCOS	Mid Gain	Gain Share
hours	Total hours	hours	hours	hours

Local - KPI 4

Failure	Mid Failure	MCOS	Mid Gain	Gain Share
hours	hours	hours	hours	hours

Measurement Frequency

These KPI's will be measured and tracked at the end of every month to allow for improvement if the numbers are falling below the goal. The KPI score will be based on the cumulative total from the monthly measurements.

Measurement Methodology

The Alliance will measure the total labour hours of the project against the hours of the underrepresented group as per the below equations. BCIB will track all the required CBA hours for underrepresented groups and with their workforce management software.

The KRA Coordinators from the Procurement and Contracting team will be responsible for tracking non-CBA hours via the submitted salary timecards for billing. Employees will have the option to state their status, as it relates to the 3 KPI's, when they are onboarded with the Alliance.

Total Hours	Total Hours	Total Hours

*Local, Indigenous and Equity members defined as per the CBA Agreement.

What can you do?

- Develop career development opportunities within the skilled trades and management workforce for Local Residents, Indigenous and Equity Groups (as defined in the CBA) as well the quality of the opportunities.
- Ensure a diverse workforce, career development and training plans for skilled workers and entry level professional staff working within the Alliance.

KPI 5 – Apprenticeship / Trainee

KPI Weighting: f KRA Potential Value: +/-

What does this mean?

The intent of this KPI is to maximize the number of apprentices and trainees on site. For this KPI apprentices and trainees will be combined into one category.

An Apprentice is a skilled trades worker working toward certification in a Red Seal trade and registered with the Industry Training Authority. A Trainee is a skilled trades worker working towards a certificate in a non-Red Seal trade as defined within the CBA, (for example, Teamsters, Operating Engineers and some Labourer trades).

The MCOS for the percentage of apprentices / trainees to journeypersons is respectively. BCIB's provincial target is but their historical overall project average is The apprenticeship / trainee target has been reviewed with the major sub trade partners and they are aligned with this goal. Based on BCIB's historical data and EllisDon, BCIB and sub-trade partner past project experience the Alliance believes this is the correct goal with a probability of achieving.

How is this measured?

Failure	Mid Failure	MCOS	Mid Gain	Gain Share
CBA hours	CBA hours	CBA hours	CBA hours	CBA hours

*Actual site hours are being measured, not personnel on site.

Measurement Frequency

The hours will be measured and tracked at the end of each month. The score will be based on the cumulative total from the monthly measurements.

Measurement Methodology

The Alliance will measure the total CBA labour hours of the project through BCIB's tracking software against the hours of the workforce as per the below equations. For the measurement of the KPI it is any hours on site, but it is in the best interest of the Alliance to ensure the development of skilled workers.

$$\frac{\text{Apprenticeship \& Trainee Hours}}{\text{Total CBA Hours}} =$$

What can you do?

- Develop and maintain an ongoing high quality apprenticeship program including skill development, ongoing mentorships and accommodating classroom training requirements (red seal apprentices, provincially recognized trainees).

Alliance Leadership Team (ALT) Endorsement

ALT Member	Signature

Health of Alliance

KRA Overall Weighting: **15%** Potential Value: +/-**$3,474,310.00**

KRA Champion:

Objective:

- To optimize the Health of the Alliance by developing, communicating, and following common strategies, to create a workplace that is inclusive, safe, enjoyable and where employees are valued and believe that what they do matters,[1].
- To measure the Team's ability to develop, implement, and reflect and correct, to sustain exceptional performance defined as a high-performing team, which is delivered in social, financial, operational, and socioeconomic terms, during the delivery of the project[2].
- To create a culturally safe and respectful workplace that integrates and aligns organizational fairness, supports employee development and accountability, provides opportunity for meaningful work, and fosters innovation through cultural competency, diversity, inclusion, collaboration, and respect. Indigenous specific anti-racism practices will be a core component of this work.

Each of the following three KPI's are weighted equally (5%) given their importance to the Health of the Alliance.

KPI 1 – Fulfillment of a High-Performing Collaborative Alliance Culture

KPI Weighting: ɔf KRA Potential Value: +/·

What does this mean?

A high performing collaborative Alliance culture is composed of various psychological, physiological and social components that focus on both soft (leadership, direction, communication, and culture) and hard (accountabilities, reporting lines and controls) management practices impacting performance. Measuring workplace health and culture should help the Team to identify the behaviours most critical to their performance, assess alignment with those behaviours and create opportunities for improvement with the outcome objective of a high-performance collaborative culture.[3]

Fulfillment of a high-performing collaborative alliance means creating an integrated organizational approach that supports the Project Charter (vision, values, and behavioural commitments) and Project expectations in developing focus, superior results, collaboration, and skill. This includes aspects of:

- Employee training, development, and accountability.
- Meaningful work (respect for roles, responsibilities, experiences, career goals/growth and the identity of the individual).

[1] PCI Group Pty. LTD. *What is Alliance Health?* PowerPoint Presentation.
[2] Ibid.
[3] Ibid.

- Fostering innovation in development of interventions throughout the project to meet the project vision, targets, and outcomes to benefit the overall results of the project in areas such as key user satisfaction, design element outcomes, whole of life and environmental sustainability, community benefits, and so forth.
- Being in alignment with the *Respectful Workplace* and *Health and Safety* plans.

A High-performing Collaborative Alliance includes the following principles:

1. Policies, procedures, training and mandatory qualifications and performance reviews are aligned with best practices.
2. Cultural safety and respectful workplace apply at all levels, in all relationships, at all times and includes:
    a. Innovation is created by different perspectives, experiences, knowledge, and understanding.
    b. Building trust requires accountability and transparency.
    c. To create an inclusive environment, barriers, and challenges to employment and to inclusion must be recognized and dismantled.
    d. Alignment of the shared Project vision
    e. Clarity of roles, responsibilities, and accountabilities.
    f. Working to achieve high-quality performance and going beyond standard expectations

How is this measured?

-100 Pain Share	- 50 Pain Share	MCOS	+50 Gain Share	+100 Gain Share
satisfaction	Satisfaction	Satisfaction	Satisfaction	Satisfaction

Health of Alliance Satisfaction Surveys:

Survey questions, methodology, and accountability will be developed in consultation with an external survey consultant.

- The survey will utilize a 1–10-point scale. 1 being totally unsatisfied and 10 being totally satisfied. A score of 5 would be neutral neither satisfied nor unsatisfied
- Specific surveys (15-20 questions) to be developed tracking Leadership (ALT, APM & AMT) perception versus Owner / Non-Owner Participant (NOP) Wider Project Team (WPT) Employees (excluding CBA workforce) and versus WPT candidates that aren't an Employee of the Owner or NOPs on integrated organizational alignment and fairness, employee development and accountability, meaningful work, fostering innovation, and high-performance
    - *Note:* WPT candidates that aren't an employee of the Owner, or an NOP will need to have consistent involvement in the Alliance at a meaningful and / or extensive level.:
- Additional surveys will be completed during (30-60-90-day reviews and exit interviews (internal), and may be conducted online, or during celebrations of success. Total number of surveys will be determined by the external survey consultant.

- Through further development of the Health of Alliance KRA Management Plan, the Alliance will review the option of using 3rd Party Health Checks to complement the results of the satisfaction surveys.
- Targeting approximately 100 participants at any one survey session (to be confirmed with an external survey consultant through development of the KRA Management Plan).
- The KPI score will be based on:
    - Qualitative analysis and review will be done through review and identification of themes and similarities and will be used to support areas where quantitative scoring can be improved to reach maximum success.
    - Quantitative analysis, which will be expressed as the centre point or typical value (mean) and the level of variation of values based thereon (standard deviation). A low standard of deviation means that most of the values are close to the mean, a high standard of deviation means that the values are spread further from the mean. The desired outcome, to achieve the metric, is to have a low standard of deviation that reflects a common reflection of the same value. For example, if the achieved metric is a mean of 7.5 on a ten-point scale, a standard deviation of one means the values are between 6.5 and 8.5, which is a low standard of deviation and is reflective of the desired metric.
    - The external survey consultant will determine weighting of qualitative and quantitative analysis. However, it is assumed that more weight will be given to quantitative analysis through statistical analysis (as outlined above).
- Surveys will be conducted every 6 months, which will be confirmed by the consultant.
- All 3 KPI's will be surveyed at the same time (6-month intervals) to be mindful of survey "burnout".
- Response rates for validity of the survey will be identified with the expert survey consultant.

Reporting

Another assessment tool will be ongoing review and analysis of reporting, which will provide actualities in quantitative data for overall health of Alliance factors relating to HR evaluations. Reporting review will be used as a tool for validation of survey findings (low reporting numbers matching a high survey value means success in developing a high-performing collaborative culture). Reporting may vary in scope and formality and may include:

- Human Resources metrics, such as:
    - Staff turnover
    - Sick leave
    - Promotion and career progression
    - Upskilling or training participation rate

How can we be successful?

- Organizational alignment, such as policies, procedures, instructional materials, team integration, and performance.
- Orientation and Training review (safety standards, certification etc.).
- Onsite training and formal education opportunities for employees, career advancement etc.
- Performance Management and 360 reviews.

- Identification and reporting of any type of safety (cultural or physical) issues, with investigation and resolution.
- Reflect and correct processes.
- Ongoing reporting and feedback mechanisms.
- Process to be developed summarizing means and methods in creating a high-performing collaborative Alliance Culture as outlined in the *People and Culture Plan*:
    - Reinforcing culture with the WPT
    - Surveys to have limited questions (12ish)
    - Quantify areas of improvement (what is realistic)
    - Follow up with expert on timing to cycle surveys, need time to reflect & correct
    - Start tracking and recording in 2023

KPI 2 – Fulfillment of a Positive Safety Culture

KPI Weighting: ɔf KRA Potential Value: +/

What does this mean?

Fulfillment of a positive safety culture means creating an organizational approach to align physical safety within the framework and in respect of the Project Charter (vision, values, and behavioural commitments) and expectations of worksite safety that meet or exceed the Worksafe BC standards and applications, which include the following pillars:

- Safety policies, procedures, standard operating procedures and expectations of worksite safety are readily available and shared.
- Employee training, development, and accountability.
- Fostering Innovation to safety awareness, training, and reporting.
- Everyone goes home at the end of the day, meaning that there is a high-level of safety precautions and protection for all employees and that it is the duty of each employee to ensure that physical safety is promoted, and safety policies are adhered to.
- Align with the *Respectful Workplace* and *Health and Safety* plans.

How is this measured?

-100 Pain Share	- 50 Pain Share	MCOS	+50 Gain Share	+100 Gain Share
satisfaction	Satisfaction	Satisfaction	Satisfaction	Satisfaction

Positive Safety Culture Satisfaction Surveys:

Survey questions, methodology, and accountability will be developed in consultation with an external survey consultant.

- The survey will utilize a 1–10-point scale. 1 being totally unsatisfied and 10 being totally satisfied. A score of 5 would be neutral neither satisfied nor unsatisfied.

- Specific surveys (10 to 12 questions) to be developed tracking Leadership (ALT, APM & AMT) perception vs WPT Employees (WPT will need to have consistent involvement in Alliance works at a meaningful and/or extensive level), including the CBA Workforce perception on:
    - General physical safety
    - orientation, training, and certification
    - policies and procedures
    - understanding of roles, responsibilities, accountabilities
    - Leadership modelling of positive safety behaviours
    - Level of satisfaction with reporting, investigating, addressing, and mitigating unsafe workplace conditions and/or behaviours.

- Additional surveys will be completed during (30-60-90-day reviews and exit interviews (internal), and may be conducted online, or during celebrations of success. The external survey consultant will determine the total number of surveys.
- Through further development of the Health of Alliance KRA Management Plan, the Alliance will review the option of using 3rd Party Health Checks to complement the results of the satisfaction surveys.
- Targeting approximately 500 participants at any one survey session (to be confirmed with survey consultant and Alliance)
- The KPI score will be based on:
    - Qualitative analysis and review will be done through review and identification of themes and similarities and will be used to support areas where quantitative scoring can be improved to reach maximum success.
    - Quantitative analysis, which will be expressed as the centre point or typical value (mean) and the level of variation of values based thereon (standard deviation). A low standard of deviation means that most of the values are close to the mean, a high standard of deviation means that the values are spread further from the mean. The desired outcome, to achieve the metric, is to have a low standard of deviation that reflects a common reflection of the same value. For example, if the achieved metric is a mean of 7.5 on a ten-point scale, a standard deviation of one means the values are between 6.5 and 8.5, which is a low standard of deviation and is reflective of the desired metric.
    - The external survey consultant will determine weighting of qualitative and quantitative analysis. However, it is assumed that more weight will be given to quantitative analysis through statistical analysis (as outlined above).
- Surveys will be conducted every 6 months, which will be confirmed by the consultant.
- All 3 KPI's will be surveyed at the same time (6-month intervals) to be mindful of survey "burnout".
- Questions will be developed with ethical considerations that ensure the true essence of the goal is creating a Positive Safety Culture environment and not financial gain from doing so.
- Response rate for validity of the survey will be identified with the expert survey consultant.

Reporting

Another assessment tool will be ongoing review and analysis of reporting, which will provide actualities in quantitative data for overall safety culture factors relating to HR evaluations. Reporting review will be used as a tool for validation of survey findings (low reporting numbers matching a high survey value means success in safety culture). Reporting may vary in scope and formality and may include:

- Incident reporting (near misses, safety compliance).
- Process reporting (e.g., tailgate meeting, toolbox meetings, attendance, and discussions).
- Total Recordable Incident Rates (TRIR).
- Other documentation as developed (e.g., online survey response, word of mouth etc.).
- Human Resources metrics, including:
    - Staff turnover
    - Sick leave
    - Promotion and career progression
    - Upskilling or training participation rate

How can we be successful?

- Organizational alignment, such as policies, procedures, instructional materials, team integration, and performance.
- Orientation and Training (safety standards, certification etc.).
- Ongoing training and education opportunities for employees (Red Seal certification, apprenticeships, career advancement etc.).
- Safety audits
- Identification and reporting of any type of physical safety or hazards, with investigation and resolution.
- Reflect and correct processes.
- Ongoing reporting and feedback mechanisms.
- Process to be developed summarizing means and methods in creating a 'Safety First' collaborative Alliance Culture as outlined in the *Respectful Workplace* and *Health & Safety* plans:
    - Reinforcing culture with the WPT
    - Surveys to have limited questions (12ish)
    - Quantify areas of improvement (what is realistic)
    - Follow up with expert on timing to cycle surveys, need time to reflect & correct
    - Start tracking and recording in 2023

KPI 3 – Fulfillment of a Culturally Safe & Respectful Work Environment

KPI Weighting: of KRA Potential Value: +/-

What does this mean?

Fulfillment of a culturally safe and respectful workplace means creating an organizational approach to align inclusive and respectful behaviours within the framework and in respect of the Project Charter (vision, values, and behavioural commitments) and workplace expectations and includes:

- A culture of learning that promotes and encourages curiosity and personal growth.
- Employee training, development, and accountability.
- Meaningful work (respect for roles, positions, and authority, and the identity of the individual).
- Fostering Innovation to cultural safety, awareness, training, and reporting.
- Integrated organizational alignment and fairness. Cultural safety includes an environment free of racism and discrimination with a particular focus on Indigenous specific Anti-racism and approaches.
- Respectful Work Environment means an environment wherein individuals are respected and supported.
- Being in alignment with the *Respectful Workplace and Health and Safety* plans.

Guiding principles include:

- Improvement of practices and procedures to protect, incorporate, promote cultural awareness, values, practices, and models of health and healing into the Alliance.
- Promotion of anti -racism with an active focus on Indigenous anti-racism.
- Interrupting, investigating, and resolving racist incidents and other acts of racism.
- Fostering meaningful collaboration and partnership to address social and environmental determinants of health and build relationships.
- Function at a high operational standard:
    - Being accountable and transparent
    - Regular reporting
    - Making best use of available resources
    - Implementing appropriate competencies for key roles and responsibilities
    - Operating with clear governance documents, policies, and procedures, including conflict of interest and dispute resolution.
- Everyone deserves respect and to be respected, supported, and to have their own identity.
- Reconciliation with Indigenous peoples is the foundation to the successful creation of a collaborative culture.
- Everyone has a right to their own beliefs and opinions and the knowledge that their opinions matter.

A culturally safe and respectful workplace includes the following foundations of inclusion:

1. Everyone has the opportunity to express concerns without judgement.
2. Everyone belongs and has value.
3. Everyone is unique.

4. Everyone is valued and respected.
5. Everyone has access to learning and development opportunities.
6. Collaboration is critical to the success of the Alliance.
7. Agreement, to create a culturally safe and respectful workplace, by leaders, managers, and employees is necessary.
8. Understanding and awareness of Indigenous specific racism and the practical application of the set standards and policies developed to promote Indigenous specific anti-racism.

How is this measured?

-100 Pain Share	- 50 Pain Share	MCOS	+50 Gain Share	+100 Gain Share
satisfaction	Satisfaction	Satisfaction	Satisfaction	Satisfaction

Cultural Safety and Respectful Workplace Satisfaction Surveys:

Survey questions, methodology, and accountability will be developed in consultation with an external survey consultant.

- The survey will utilize a 1–10-point scale. 1 being totally unsatisfied and 10 being totally satisfied. A score of 5 would be neutral neither satisfied nor unsatisfied
- Specific surveys (10 to 12 questions) to be developed tracking Leadership (ALT, APM & AMT) perception vs WPT Employees (WPT will need to have consistent involvement in Alliance works at a meaningful and/or extensive level), including the CBA Workforce perception on:
    - Inclusion, cultural, psychological, and physiological safety
    - orientation, training, and certification
    - policies and procedures
    - understanding of roles, responsibilities, accountabilities
    - level of satisfaction with reporting, investigating, addressing, and mitigating unsafe workplace conditions and/or behaviours

      Note: External candidates to meet the following criteria:
        - Have consistent involvement in Alliance works at a meaningful and/or extensive level
- Additional surveys will be completed during (30-60-90-day reviews and exit interviews (internal), and may be conducted online, or during celebrations of success. The external survey consultant will determine total number of surveys.
- Through further development of the Health of Alliance KRA Management Plan, the Alliance will review the option of using 3rd Party Health Checks to complement the results of the satisfaction surveys.
- Targeting approximately 500 participants at any one survey session (to be confirmed with survey consultant and Alliance).
- The KPI score will be based on:
    - Qualitative analysis and review will be done through review and identification of themes and similarities and will be used to support areas where quantitative scoring can be improved to reach maximum success.

    - Quantitative analysis, which will be expressed as the centre point or typical value (mean) and the level of variation of values based thereon (standard deviation). A low standard of deviation means that most of the values are close to the mean, a high standard of deviation means that the values are spread further from the mean. The desired outcome, to achieve the metric, is to have a low standard of deviation that reflects a common reflection of the same value. For example, if the achieved metric is a mean of 7.5 on a ten-point scale, a standard deviation of one means the values are between 6.5 and 8.5, which is a low standard of deviation and is reflective of the desired metric.
    - The external survey consultant will determine weighting of qualitative and quantitative analysis. However, it is assumed that more weight will be given to quantitative analysis through statistical analysis (as outlined above).
- Surveys will be conducted every 6 months, which will be confirmed by the consultant.
- All 3 KPI's will be surveyed at the same time (6-month intervals) to be mindful of survey "burnout".
- Questions will be developed with ethical considerations that ensure the true essence of the goal is the creation of a Cultural Safety and Respectful Workplace Culture and not financial gain from doing so.
- Response rate for validity of the survey will be identified with the expert survey consultant

Reporting

Another assessment tool will be ongoing review and analysis of reporting, which will provide actualities in quantitative data for overall Cultural Safety & Respectful Workplace culture factors relating to HR evaluations. Reporting review will be used as a tool for validation of survey findings (low reporting numbers matching a high survey value means success in developing a culturally safe and respectful workplace). Reporting may vary in scope and formality and may include:

- Incident reporting (complaints and investigation reports).
- Process reporting (e.g., tailgate meeting, toolbox meetings, attendance, and discussions).
- Other documentation, as developed (e.g., online survey response, word of mouth etc.).
- Human Resources metrics, including:
    - Staff turnover
    - Sick leave
    - Promotion and career progression
    - Upskilling or training participation rate

How can we be successful?

- Organizational alignment, such as policies, procedures, instructional materials, team integration, and performance.
- Orientation and Training (cultural safety, Indigenous cultural competency, anti-racism, GBA+, intersectionality).
- Ongoing training and education, cultural experiences.
- Identification and reporting of any type of unsafe workplace behaviour (disrespect, discrimination, racism, aggression etc.), with investigation and resolution.
- Reflect and correct processes, including, where appropriate, culturally based processes.

- Ongoing reporting and feedback mechanisms.
- Process to be developed summarizing means and methods in creating a Culturally Safe and Respectful Workplace as outlined in the *Respectful Workplace and Health and Safety* plans:
    - Reinforcing culture with the WPT
    - Surveys to have limited questions (12ish)
    - Quantify areas of improvement (what is realistic)
    - Start tracking and recording in 2023
    - Follow up with expert on timing to cycle surveys, need time to reflect & correct

Alliance Leadership Team (ALT) Endorsement

ALT Member	Signature

Execution

VANCOUVER ISLAND HEALTH AUTHORITY

Per: DocuSigned by: Kathryn MacNeil 3759B45B231F454...

Name: Kathryn MacNeil

Title: President and CEO

ELLISDON CORPORATION

Per: DocuSigned by: Sean Dekoning 593E5D9EA4CC45A...

Name: Sean Dekoning

Title: Vice President & Area Manager

PARKIN ARCHITECTS WESTERN LTD.

Per: DocuSigned by: 1735BCA879ED4D8...

Name: Robert Cameron Shantz

Title: Director, Architect AIBC