

**SCHEDULE 17****OUTLINE COMMISSIONING PROGRAM****1. DEFINITIONS****1.1 Definitions. The following terms shall have the following meanings:**

- (a) “as built drawings” means, for purposes of this Schedule, drawings prepared by Project Co in a format and with content and details that Health Co, acting reasonably, considers appropriate, including showing all alterations made from drawings reviewed and accepted by Health Co pursuant to the Review Procedure.
- (b) “BC Building Code” means British Columbia Building Code 1998 as amended or replaced from time to time, subject to Project Co’s entitlement to a Relevant Change in Law.
- (c) “Canadian and Industry Standard” means, at the applicable time, those standards, practices, methods and procedures applicable to Good Industry Practice.
- (d) “Cash Allowance Equipment Commissioning” means the work to be performed by Project Co pursuant to Section 3.4(e) of this Schedule in respect of Cash Allowance Equipment.
- (e) “Commissioning Tests” means all commissioning tests described in this Schedule, or required by any Applicable Law, Canadian and Industry Standards, CSA Standards listed in Appendix 1, commissioning tests recommended by the manufacturer of any part of the Plant or Equipment, or required to be included in the Final Commissioning Program by Health Co or the Independent Certifier during its development pursuant to Section 24.2 of this Agreement.
- (f) “Contingency Planning” has the meaning given in Section 4E1.1 of Schedule 18 – Output Specifications.
- (g) “CSA Standard” means, at the applicable time, the Canadian Standards Association standards.
- (h) “HVAC” means heating ventilation and air conditioning.
- (i) “Manuals” means all manuals to be prepared by Project Co pursuant to this Agreement, including all policy and procedure manuals.
- (j) “Occupancy Permit” means all Permits, Licences and Approvals required for the occupancy of the Facility as a health care facility in compliance with Authorities having Jurisdiction.

**2. FINAL COMMISSIONING PROGRAM****2.1 General**

- (a) The Final Commissioning Program shall:
  - (i) require Project Co to successfully complete all Commissioning Tests, and all other commissioning activities required for the proper commissioning of

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- the Facility, to the satisfaction of the Independent Certifier, acting reasonably;
- (ii) require Project Co to successfully complete all Commissioning Tests, and all other commissioning activities required for commencement of the Services, to the satisfaction of the Independent Certifier, acting reasonably;
  - (iii) provide that the methodology for each Commissioning Test shall be:
    - (A) where one is prescribed by Applicable Law the methodology so prescribed; and
    - (B) where one is not prescribed by Applicable Law, but one is prescribed by the Canadian and Industry Standards or listed CSA Standards, the methodology so prescribed;
  - (iv) provide that the standards or results to be achieved in each Commissioning Test for such Commissioning Test to be successful shall be all standards or results applicable to such Commissioning Test as contained in any Applicable Law, the BC Building Code, Canadian and Industry Standards, CSA Standards listed, this Agreement (including this Schedule and the Output Specifications), and those recommended by the manufacturer of that part of the Plant or Equipment with respect to which the Commissioning Test is to be performed;
  - (v) require Project Co to provide all Commissioning Test results and copies of all certificates or other Permits, Licences and Approvals received by Project Co in connection with any Commissioning Test to the Independent Certifier; and
  - (vi) provide that where a Commissioning Test has been successfully completed as required by the Final Commissioning Program, and where that Commissioning Test is identical to a Commissioning Test that is required to satisfy any subsequent Final Commissioning Program requirement, the Commissioning Test does not need to be repeated unless specifically required by Authorities Having Jurisdiction or Applicable Law.
- (b) The Final Commissioning Program must provide for the following:
- (i) the Method Statements;
  - (ii) tests and requirements to commence the Services;
  - (iii) a schedule of equipment (as set out in Section 3.4 of this Schedule);
  - (iv) survey plans and as built drawings in electronic form;
  - (v) a schedule of calibration tests;
  - (vi) all tests and requirements for commissioning medical and non-medical equipment;
  - (vii) all tests, criteria and certificates for commissioning HVAC, plumbing, fire protection, medical gas and specialty systems;

- (viii) all information, tests, criteria, approvals and certificates for commissioning radiology, nuclear medicine and cancer treatment services (radiotherapy);
- (ix) Schedule B - Letters of Assurance signed by the Architect of Record and Engineer(s) of Record as provided for in this Schedule;
- (x) Schedule C - Assurance of Professional Field Review and Compliance in accordance with Section 2.6 of the British Columbia Building Code signed by the Engineer(s) of Record, and Architect of Record;
- (xi) the process to achieve LEED Silver Certification;
- (xii) a floor area schedule (as set out in Section 3.2 of this Schedule);
- (xiii) a staff profile (as set out in Section 3.5 of this Schedule);
- (xiv) a schedule of training to be provided to all relevant Health Co and Project Co personnel;
- (xv) the occupancy requirements set out in Appendix 9 of this Schedule;
- (xvi) methodology for Contingency Planning requirements;
- (xvii) schedule of sterile areas and methodology for final clean (as set out in Section 8.2 of this Schedule); and
- (xviii) all Manuals and the Service Quality Plan.

## 2.2 Conduct of Commission Tests

- (a) The Final Commissioning Program shall provide that all Commissioning Tests on Plant and Equipment must be conducted by appropriately qualified persons, including as follows:
  - (i) electrical acceptance testing (all patient equipment) by a practicing independent biomedical engineer;
  - (ii) area testing (operating theatre, intensive care unit, isolation areas, nursery, etc) by a biomedical engineer or technologist;
  - (iii) calibration and acceptance testing (anaesthetic medical gases, televisions, security systems, sterilisation equipment, gas outlets, etc.), by a biomedical engineer, supplier installer, maintenance engineer and/or technologist, supplier installer, maintenance engineer as applicable;
  - (iv) noise testing of mechanical systems (kitchens, plant rooms, workstations, patient rooms, etc) by an Engineering technologist or equivalent;
  - (v) performance testing of all related patient equipment (eg. syringe pumps, infusion pumps, ventilators, etc.), by a practising independent biomedical engineer or technologist;
  - (vi) computer systems testing by the information technology supplier, installer or maintenance engineer;

- (vii) temperature testing (boilers, air conditioning plant) by, an engineering technologist, installer, maintenance engineer or as applicable;
- (viii) radiology and laboratory equipment calibration and plant assessment by the supplier/installer, and performance testing by a person or organisation qualified to undertake such calibration or testing; and
- (ix) linear accelerator calibration and testing by the supplier/installer, and performance testing by a person or organisation qualified to undertake such calibration or testing.

### **3. SUBSTANTIAL COMPLETION COMMISSIONING REQUIREMENTS**

#### **3.1 General**

- (a) The Final Commissioning Program shall, among other requirements contained in this Agreement, require the following in order for Project Co to achieve Substantial Completion:
  - (i) the successful completion of all Commissioning Tests set out in Appendix 1 unless otherwise noted therein that particular Commissioning Tests are to be conducted subsequent to Substantial Completion;
  - (ii) obtaining all certificates or other approvals to be obtained by Project Co in connection with the Commissioning Tests set out in Appendix 1 unless otherwise noted therein that particular certificates or other approvals are to be obtained subsequent to Substantial Completion;
  - (iii) the issuance of the Occupancy Permit, and provision of a copy of the Occupancy Permit to Health Co and the Independent Certifier;
  - (iv) that all of the occupancy requirements set out in Appendix 9 of this Schedule have been met;
  - (v) that all medical gas systems are operating in accordance with the applicable CSA Standard;
  - (vi) confirmation from the Independent Certifier that all Plant and Equipment has been installed and commissioned;
  - (vii) issuance of Schedule C Assurance of Professional Field Review and Compliance in accordance with Section 2.6 of the BC Building Code;
  - (viii) [\*Reserved];
  - (ix) that all Plant and other equipment (described in Appendix 8 of this Schedule) are operating continuously and successfully for at least 14 days as described in Appendix 8 of this Schedule;
  - (x) that the HVAC and plumbing systems of the Facility comply with microbiological standards;
  - (xi) that all insurances are current and all binder letters have been issued;

- (xii) that all Manuals and the Service Quality Plan have been submitted to and accepted by Health Co and the Independent Certifier;
  - (xiii) Project Co has completed or scheduled to complete all training of its, Health Co's and the Health Authorities' personnel required by this Agreement, at Substantial Completion;
  - (xiv) Project Co has, in respect of Clinical Functionality, completed the Facility in accordance with and to satisfy the Clinical Functionality Report, as reviewed pursuant to Schedule 11 - Review Procedure, or as was subsequently agreed in writing by the Parties; and
  - (xv) all Works have been completed, other than the Minor Deficiencies.
- (b) Where a test is to occur as identified in Appendix 1 after Substantial Completion, Project Co shall complete the testing within 60 days after Substantial Completion and it shall not form part of the Substantial Completion requirements.

### 3.2 Floor area schedule

- (a) The Final Commissioning Program shall, among other requirements contained in this Agreement, require Project Co in order for Project Co to achieve Substantial Completion, to obtain and provide to Health Co and the Independent Certifier a floor area schedule prepared by the Constructor and the Architect of Record that compares the floor area described in the Schedule of Accommodation, as modified through the Review Procedure, to the as built floor area. The floor area schedule is to incorporate the following information:
- (i) gross floor area;
  - (ii) zone and room type;
  - (iii) original tendered areas;
  - (iv) as built floor areas; and
  - (v) differential of areas between the floor described in the Schedule of Accommodation, as modified through the Review Procedure, and the floor areas as built.

### 3.3 Plant & Equipment - Quality Assurance

- (a) The Final Commissioning Program shall, among other requirements contained in this Agreement, require Project Co in order for Project Co to achieve Substantial Completion, to have provided the following to Health Co and the Independent Certifier:
- (i) a final list of all quality assurance non-conformances identifying:
    - (A) the description of the type of non-conformance;
    - (B) the date the non-conformance was identified;
    - (C) the Constructor's comments;
    - (D) the action taken to rectify the non-conformance; and

- (E) the Architect of Record's and the Engineer(s) of Record's comments;
- (ii) confirmation from the Architect of Record and the Constructor that all non-conformances have been attended to and rectified and that they meet the original design intent and all Design Data reviewed and accepted by Health Co pursuant to the Review Procedure; and
- (iii) confirmation from the Architect of Record and the Engineer(s) of Record that all of the Works were completed in general conformance with the Design Data and the Design Quality Plan and the Construction Quality Plan, respectively.

### **3.3.1 Trades Quality Sign Off**

- (a) The Final Commissioning Program shall, among other requirements contained in this Agreement, require Project Co in order for Project Co to achieve Substantial Completion, to have obtained from each of its Subcontractors written confirmation that all work it has undertaken on Site complies with Canadian and Industry Standards, the BC Building Code requirements and is in accordance with all documentation supplied by the Constructor.

### **3.3.2 Certifying Professionals Quality Sign Off**

- (a) The Final Commissioning Program shall, among other requirements contained in this Agreement, require for Project Co to achieve Substantial Completion, to have obtained from:
  - (i) all of Project Co's registered professionals (including the Architect of Record and the Engineer(s) of Record), letters of assurance that the work substantially conforms in all material respects to the plans and supporting documentation prepared by the registered professional;
  - (ii) the Architect of Record and Engineer(s) of Record as appropriate, confirmation that:
    - (A) all Plant and Equipment installed by Project Co is that which was specified as part of this Agreement;
    - (B) where changes to Plant or Equipment have been provided, that the equipment installed is fit for purpose and is of either comparable, equivalent or higher standard; and
    - (C) the appropriate certifying professional monitors or witnesses at his discretion the commissioning of the Plant or Equipment, to the extent required in his professional opinion, to provide certification and is satisfied that commissioning is in general conformance with the plans and supporting documents and is satisfied its commissioning was completed in accordance with the Final Commissioning Program.

**3.4 Schedule of Equipment**

- (a) The Final Commissioning Plan shall provide that not less than 30 Business Days before Project Co proposes to commence Commissioning Tests in connection with Substantial Completion, Project Co must submit to Health Co and the Independent Certifier a schedule identifying the location, quantity, manufacturer and model number (as applicable) of each piece of Equipment, and the Category E: Project Co Supplied Equipment for F.M. Services on a room by room basis, and consistent with the relevant room data sheets and Sections 3.4(b) and 3.4(c) below.
- (b) The schedule of equipment shall contain a list of all such equipment requiring calibration or biomedical testing, or that must be approved or certified by any Governmental Authority, in the form attached as Appendix 11 of this Schedule, including details of:
- (i) commissioning and calibration requirements including any calibration manuals, tests and standards;
  - (ii) manufacturer's commissioning and calibration or biomedical testing requirements including any calibration manuals, tests and standards;
  - (iii) relevant calibration or biomedical test benchmarks;
  - (iv) any equipment which is to be tagged to demonstrate calibration and/or biomedical testing; and
  - (v) the tag number for each such item.

This equipment may include but is not limited to the following items;

- (vi) all patient related equipment (eg. patient monitors, ventilators, pumps endoscopes, anaesthesia and blood pressure units);
  - (vii) operating room and birthing lights;
  - (viii) radiology equipment;
  - (ix) cancer agency equipment, including linear accelerators; and
  - (x) laboratory equipment (including biological safety cabinets).
- (c) The schedule of equipment shall contain confirmation from Project Co that all Plant and Equipment conform (as applicable) to:
- (i) CSA Standards; and
  - (ii) Applicable Law.
- (d) The Final Commissioning Program shall, among other requirements contained in this Agreement, require Project Co in order for Project Co to achieve Substantial Completion to:
- (i) confirm that the equipment identified in the schedule of equipment has been accepted by Project Co; and

- (ii) establish that the suppliers of such equipment have progressively trained or are scheduled to train Health Co, Health Authorities and Project Co personnel (in each case, where necessary) in the use of such equipment inclusive of critical equipment as part of an overall training plan.
- (e) Project Co shall, as a requirement for Substantial Completion, commission all Cash Allowance Equipment with the exception of two Linear Accelerators which shall be commissioned within 60 days of Substantial Completion. Project Co shall commission all Cash Allowance Equipment pursuant to the following commissioning categories (being Category 1, Category 2, Category 3 and Category 4), with each category equipment item being identified in Appendix 11 to this Schedule 17:
  - (i) Category 1 - Operation Ready: Project Co has performed all relevant Project Operations so that Health Co may proceed using the Equipment as part of the operation of the Facility for the purposes of the Clinical/Non-Clinical Services (i.e.: by staff with or without patients).
  - (ii) Category 2 – Substantiation Ready: Project Co has performed all relevant Project Operations so that Health Co may commence using the Equipment as part of the operation of the Facility for the purposes of the Clinical/Non-Clinical Services after Health Co performs minor calibration, adjustments and substantiation testing (Biomed).
  - (iii) Category 3 - Clinical Trial Ready: Project Co has performed all relevant Project Operations, including supplier testing, all calibration, certification by third parties and provision of permits, licences and approvals where applicable, so that Health Co may commence using the Equipment as part of the operation of the Facility for the purposes of the Clinical/Non-Clinical Services after Health Co performs clinical trials (e.g., diagnostic imaging equipment) and the minor adjustments following those trials are performed by Health Co and/or the equipment suppliers.
  - (iv) Category 4 - Calibration Ready: Project Co has performed all relevant Project Operations, including supplier testing and supplier calibration of the item and provided third party certification, permits, licences and approvals where applicable, so that Health Co may commence using the Equipment as part of the operation of the Facility for the purposes of the Clinical/Non-Clinical Services after Health Co performs clinical calibration including calibration for operation as part of the Health Authority system prior to clinical use.

### **3.5 Staff Profile**

- (a) The Final Commissioning Program shall, among other requirements contained in this Agreement, require Project Co in order for Project Co to achieve Substantial Completion, to provide to Health Co and the Independent Certifier a schedule containing the name, qualifications, roster and training details of all personnel who will carry out the following duties at the Facility:
  - (i) general management;
  - (ii) food services operations;
  - (iii) house keeping operations;

- (iv) laundry operations;
- (v) materiel operations;
- (vi) plant services operations;
- (vii) protection services operations;
- (viii) utility services operations;
- (ix) car parking operations; and
- (x) delivery of any other Service.

### **3.6 Medical Imaging Services**

- (a) The Final Commissioning Program shall, among other requirements contained in this Agreement, require Project Co, to ensure that all medical imaging equipment has been commissioned as part of the Cash Allowance Equipment Commissioning and as a requirement for Substantial Completion that the following information has been provided to Health Co and the Independent Certifier:
  - (i) copies of, and the location of originals of, all required radiology equipment Permits, Licences and Approvals except as required to be obtained by Health Co;
  - (ii) list of all medical imaging equipment that is required to be registered pursuant to Applicable Law;
  - (iii) copies of, and the location of originals of, all required Permits, Licenses and Approvals evidencing that the Facility meets all radiation shielding requirements pursuant to Applicable Law; and
  - (iv) confirmation from the relevant approving body of accreditation for installation of all radiology equipment, with relevant certificates from such approving body to follow after Substantial Completion.

### **3.7 Radiotherapy Services**

- (a) The Final Commissioning Program shall, among other requirements contained in this Agreement, require Project Co, to ensure that all radiotherapy equipment has been commissioned (in so far as limited by Section 3.4(e) of this Schedule) as part of the Cash Allowance Equipment Commissioning and as a requirement for Substantial Completion that the following information has been provided to Health Co and the Independent Certifier:
  - (i) copies of, and the location of originals of, all required radiotherapy equipment Permits, Licences and Approvals related to Project Co requirements to complete Cash Allowance Equipment Commissioning except as required to be obtained by Health Co;
  - (ii) list of all radiotherapy equipment that is required to be registered pursuant to Applicable Law;

- (iii) copies of, and the location of originals of, all required Permits, Licenses and Approvals and approval from a BCCA physicist, evidencing that the Facility meets all radiation shielding requirements pursuant to Applicable Law; and
- (iv) confirmation from the relevant approving body of accreditation for installation of all radiotherapy equipment related to Project Co requirements to complete Cash Allowance Equipment Commissioning, with relevant certificates from such approving body to follow after Substantial Completion.

### **3.8 Establishment on Site**

- (a) The Final Commissioning Program shall, among other requirements contained in this Agreement, require Project Co to establish that it has available, and has provided to Health Co and the Independent Certifier, copies of:
  - (i) records relevant to location, plans, boundaries and titles to the Site;
  - (ii) as built drawings;
  - (iii) all relevant manuals (including those of the Manuals required) and documentation to facilitate provision of the Services;
  - (iv) all relevant Permits, Licences and Approvals obtained by Project Co, and documentation for all such relevant Permits, Licence and Approvals obtained by Project Co, including any correspondence that is of material relevance, except as required to be obtained by Health Co; and
  - (v) records relevant to compliance with all Applicable Laws.

### **3.9 Minor Deficiencies List**

- (a) The Final Commissioning Program shall, among other requirements contained in this Agreement, require Project Co in order for Project Co to achieve Substantial Completion, to provide a Minor Deficiency List identifying:
  - (i) all Minor Deficiencies;
  - (ii) the date each Minor Deficiency was identified;
  - (iii) the Constructor's comments; and
  - (iv) the Architect of Record's and the Engineer(s) of Record's comments.
- (b) Subject to Section 3.9(a) of this Schedule, any requirement stated in this Schedule in order for Project Co to achieve Substantial Completion is subject to the exceptions:
  - (i) for Minor Deficiencies; and
  - (ii) set forth in Section 21.1(h) of the Agreement relating to used Cash Allowance Equipment obtained or procured by Health Co.

**4. [\*RESERVED]****5. ACHIEVING A HEALTH CO STANDARD OF OPERATIONAL READINESS**

- (a) The Final Commissioning Program shall, among other requirements under this Agreement, require Project Co, to demonstrate operational readiness of the Facility in accordance with the Output Specifications and Health Authority Policies to the Independent Certifier pursuant to Appendix 3 of this Schedule through a range of simulations described in Appendix 3 to this Schedule.
- (b) The Parties agree that whether or not each test forms part of the requirements for Substantial Completion is as expressly provided in Appendix 3. Where a test is stated to be performed after Substantial Completion:
- (i) Project Co shall ensure that any such test is completed within 60 days of Substantial Completion, except as provided in Section 6(a); and
  - (ii) the Parties acknowledge that such test will be conducted with consideration given for the extent of the Services to be provided by Project Co in accordance with Section 24.6 of this Agreement and all reasonably related factors (including the level of on-site Project Co staff).

**6. CONTINGENCY PLANNING REQUIREMENTS**

- (a) The Final Commissioning Program shall, among other requirements contained in this Agreement, require Project Co:
- (i) to successfully conduct the following contingency code requirements by calling mock drills for the following (as each is defined in the FM Output Specifications):
    - (A) Code Red – Fire within 15 days of Substantial Completion;
    - (B) Code Blue – Cardiac Arrest within 60 days of Substantial Completion;
    - (C) Code Green – Evacuation within 60 days of Substantial Completion;
    - (D) Code Orange – Disaster within 60 days of Substantial Completion;
    - (E) Code Black – Bomb Threat within 15 days of Substantial Completion;
    - (F) Code Yellow – Missing Patient within 60 days of Substantial Completion;
    - (G) Code White – Aggressive Behaviour within 60 days of Substantial Completion;
    - (H) Code Brown – Chemical Spill within 15 days of Substantial Completion; and

- (i) Code Grey – Air Exclusion within 60 days of Substantial Completion;
- (ii) demonstrate to the reasonable satisfaction of the Independent Certifier its preparedness and ability to take part in the Fraser Health Emergency Response System and any other emergency planning that is required by Health Co within 60 days of Substantial Completion; and
- (iii) demonstrate to the reasonable satisfaction of the Independent Certifier and any Governmental Authority having jurisdiction for contingency planning, that within the relevant time periods identified in Sections 6(a)(i)(A) to 6(a)(i)(I) above:
  - (A) adequate and appropriate emergency procedures have been implemented for the Facility (which procedures will be contained in the manuals to be provided pursuant to Section 24.5(a) of this Agreement); and
  - (B) Project Co's personnel, Health Co's personnel and the Health Authorities' personnel have received adequate and appropriate training in those contingency plans that Project Co manages.
- (b) The Parties acknowledge that the requirements contained in Section 6(a) will be conducted with consideration given for the extent of the Services to be provided by Project Co in accordance with Section 24.6 of this Agreement and all reasonably related factors (including the level of on-site Project Co staff).

## **7. FINAL COMPLETION**

- (a) The Final Commissioning Program shall, among other requirements contained in this Agreement, in order for Project Co to achieve Final Completion, require Project Co to have successfully completed all Commissioning Tests, and all other commissioning activities required for the proper commissioning of the Facility, and all Plant and Equipment, which were the subject of the Minor Deficiencies.

## **8. ADDITIONAL INFORMATION**

### **8.1 Policy & Manuals**

- (a) The Final Commissioning Program shall require that a schedule for submission by Project Co to Health Co of all Manuals to be prepared by Project Co pursuant to this Agreement, and acceptable to the Independent Certifier, acting reasonably, must be submitted to Health Co at least 30 days prior to Substantial Completion.

### **8.2 Final Clean**

- (a) The Final Commissioning Program shall include the following obligations on Project Co, as a requirement for Substantial Completion:
  - (i) that not less than 30 days before Project Co proposes to commence the Project Co Commissioning, Project Co must submit to Health Co and the Independent Certifier a schedule which:

- (A) contains details of all operating rooms and other sterile areas which are required to meet bacteriological standards of cleanliness pursuant to this Agreement; and
  - (B) describes a detailed and comprehensive methodology for cleaning the Facility and Site, including the program for cleaning;
- (ii) Project Co shall thoroughly clean the Facility and the Site to an appropriate standard (for hospitals in British Columbia) having regard to its intended purpose. In particular, operating suites and other sterile areas (including HVAC systems) must be cleaned to the highest standards per Standards of Cleanliness in the National Health Services "A Framework In Which To Measure Performance Outcomes" dated August 2003;
  - (iii) Project Co shall demonstrate to the reasonable satisfaction of the Independent Certifier that an "infection control standard" in sterile areas has been established per the recommended standards, guidelines, and position statements for perioperative registered nursing practice, prepared by Operating Room Nurses Association of Canada dated August 2003, 5<sup>th</sup> Addition; and
  - (iv) Project Co shall demonstrate to the reasonable satisfaction of the Independent Certifier that equipment air meets the appropriate standard of cleanliness and that air purity samples are in accordance with WCB exposure limits.

### 8.3 Maintenance Plans

- (a) The Final Commissioning Program shall, among other requirements, require Project Co in order for Project Co to achieve Substantial Completion:
  - (i) that Project Co develop the Scheduled Maintenance Plan, the 5 Year Maintenance Plan and the Plant Services Information Management System and they have been accepted by Health Co in accordance with the Review Procedure and the Independent Certifier as being in compliance with the Output Specifications and other relevant provisions of the Agreement; and
  - (ii) that Project Co develop the 5 Year Maintenance Plan, and that it has been accepted by Health Co in accordance with the review Procedure and the Independent Certifier as being in compliance with the Output Specifications.

### 8.4 Asset Register

- (a) The Final Commissioning Program shall require that Project Co develop an asset register that has been accepted by Health Co in accordance with the Review Procedure and the Independent Certifier as being in compliance with the Output Specifications, prior to Substantial Completion.

### 8.5 Record of Commissioning

- (a) The Final Commissioning Program shall require that within one month after the Substantial Completion Date, Project Co must submit to the Independent Certifier and Health Co a revised version of the Final Commissioning Program inclusive of all test criteria, all applicable standards, methodologies, data, test results, certificates and

approvals that were obtained by Project Co in order to achieve Substantial Completion. A further revised version of the Final Commissioning Program will be prepared when all commissioning tests to be conducted subsequent to Substantial and Substantial Completion have been completed and will at no time be completed later than Final Completion.

**9. RESPONSIBILITY FOR COMMISSIONING**

- (a) Notwithstanding anything else contained in this Agreement, Project Co shall at all times remain responsible for the Project Co Commissioning.

**APPENDICES**

- **Appendix 1**      **Commissioning Tests**
- **Appendix 2**      **Equipment List**
- **Appendix 3**      **Operational Readiness Simulations**
- **Appendix 4**      **List of Calibration Test Benchmarks & Manufactures Requirements**
- **Appendix 5**      **Schedule of Defects & Closing Out**
- **Appendix 6**      **Commissioning Program**
- **Appendix 7**      **[\*Reserved]**
- **Appendix 8**      **Monitoring of Building Systems and Operations**
- **Appendix 9**      **Occupancy Requirements**
- **Appendix 10**     **Table - Testing Benchmarks**
- **Appendix 11**     **Cash Allowance Equipment Commissioning Categories**

**Appendix 1 Commissioning Tests**

[Appendix 1 follows this page.]

The Parties acknowledge that:

- 1) the tests identified in this Appendix 1 as being conducted after Substantial Completion will not form part of the Substantial Completion requirements; and
- 2) the tests identified in this Appendix 1 in respect of Equipment operation are intended to confirm equipment readiness and not readiness for the performance by Health Co of the Clinical/Non-Clinical Services.

**SUBSTANTIAL COMPLETION TESTS – ABBOTSFORD HOSPITAL AND CANCER CENTRE**

Criteria/ Standard      Authority Approvals      Test Parameters

**PART A - Hospital Building Systems  
Commissioning**

**1.0 Fire and Hydraulic , Domestic Water,  
Storm Water and Sanitary Waste Services**

1.1 In ground sewer installations	BC Plumbing Code 1998	Local Municipal Authority, Authority as required/if not required Code Consultant	Certificate Issued
1.2 In ground and above ground storm water installations	BC Plumbing Code 1998	Local Municipal Authority, Authority as required/if not required Code Consultant	Certificate Issued
1.3 All above ground sanitary plumbing and domestic cold water service installations	BC Plumbing Code 1998	Local Municipal Authority, Authority as required/if not required Code Consultant	Certificate Issued
1.4 All fire installations including, sprinklers hydrants and hose systems should be fully tested	NFPA 13-2002& NFPA 14-2000	Local Municipal Authority and/or Local Fire Authority	Certificate Issued
1.5 All service valves tested and certified by the valve manufacturer	Appropriate Canadian Standard	Local Municipal Authority, Authority as required/if not required Code Consultant	Certificate Issued
1.6 Medical Gases and Specialty Plumbing Systems	CSA Z-305.1-92 and BC Plumbing Code 1998	Local Municipal Authority or Authorities having jurisdiction	Certificate Issued

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	<b>Criteria/ Standard</b>	<b>Authority Approvals</b>	<b>Test Parameters</b>
<b>2.0 Mechanical Services</b>			
<b>General</b>			
The mechanical system will be tested to the relevant standards including Special Design Criteria to be achieved	CSAZ318.1-95, Ashrae STD. 1-1998		
<b>Outdoor Conditions</b>			
Summer	30.0oC DB 20.0°C WB Full Solar Load		
Winter	-12.0°C DB No Solar Gain		
<b>Internal Conditions</b>	CSA Z317.2-01		

	Criteria/ Standard	Authority Approvals	Test Parameters
<b>Outside Air</b>			
Ventilation	CSA Z317.2-01		
Infiltration – Exterior Wall			<p>As determined by the Building Envelope Professional, having regard to the following:</p> <p><u>Curtain Wall</u> Air Leakage Resistance: ASTM E283, less than 0.3 l/s/m2 @75 pascals</p> <p><u>Exterior Insulation and Finish System (Insulated Acrylic Stucco System):</u> Air Leakage Resistance: ASTM E283, less than 0.1 l/s/m2.</p> <p><u>Air Seal Membrane: (Membrane behind the Brick Cavity wall system)</u> Air leakage caused by static air pressure across the wall, soffit and roof assemblies including interruptions to the integrity of wall and roof systems such as junctions with dissimilar construction not to exceed 0.1 l/s/m2 at 75 pascals when tested in accordance with ASTM E283.</p> <p><u>Other solid wall assemblies requiring air barriers and membranes:</u> Equivalent and similar standards to above.</p>
<b>Supply Air</b>			
	As required to suit building thermal loads. And as per CSA Z317.2-01		

**Criteria/ Standard      Authority Approvals      Test Parameters**

**2.1 Construction Tests**

**2.2 Operating Tests**

Testing to be carried out to AABC(National Standards for Field Measurement and instrumentation , & ASHRAE Standards

**(a) Air System Air conditioning**

Each air terminal to be adjusted to provide even distribution. Air quality to be balanced with air dampers set to achieve lowest fan speed and power consumption

ASHRAE 2003 Applications Handbook, Chapter 37

+/-10% of design value for non critical areas

Fan air quantity shall be adjusted by blade pitch and fan speed setting to deliver

+/-5%% of design value

Main Air Ducts

+/-5%

Critical Area:  
Positive Zones:  
Negative Zones

Supply Air: 0 to+10%; Exhaust/Return Air: 0 to -10%.  
Supply Air: 0 to -10%; Exhaust/Return Air: 0 to +10%

Fan speed shall be recorded

**(b) Exhaust Systems**

Air quantity at each exhaust point shall be balanced to achieve drawing value

ASHRAE 2003 Applications Handbook, Chapter 37

+/-10% of design value for non-critical areas

Fan air quantity shall be adjusted by blade pitch and fan speed setting to deliver

+/-5% of design value

Main Exhaust Ducts:

+/-5%

	Criteria/ Standard	Authority Approvals	Test Parameters
Critical Areas:			Same values as in (a) Air System Air Conditioning.
Fan speed shall be recorded			
<b>(c) Air System Heating</b>			
Air quality at each air terminal shall be balanced to achieve drawing value	ASHRAE 2003 Applications Handbook, Chapter 37		+/-10% of design value
Fan Air quantities:			+/-5%
Main Air Ducts:			+/-5%
Critical Areas:			Same values as in (a) Air System Air Conditioning
All piping should be pressure and leak tested with industry standards	Canadian and Industry Standard		Mechanical Contractor
<b>Hydronic noise and vibration</b>			
Class 1 Areas & Patient Rooms	CSA Z317.2-01 NR30	AScT(applied science Technologist)	Check and record level
Class 11 Areas	NR35	AScT	Check and record level
Class 111 Areas	NR35	AScT	Check and record level
Plant Areas	NR45 NR50	AScT	Check and record level
Other Areas	NR35 - NR40	AScT	Check and record level
<b>(d) Hydronic Systems</b>			
Flow quantity in each terminal circuit:			+/-10% of design value
Pump flow will be adjusted to:			+/-10% of design value; +/-5% for critical hydronic applications

	<b>Criteria/ Standard</b>	<b>Authority Approvals</b>	<b>Test Parameters</b>
<b>(e) Controls</b>			
Pressure, temperature and humidity			tested and adjusted to operate at correct settings
Pressure and temperature limit controls			tested and adjusted to safe operating settings and trip times
<b>(g) Noise</b>			
Once systems are balanced, sound level measurements are to be taken	CSDA Z317.2-01		Check and record levels
<b>(h) Gas and Gas Service Installations</b>			
All LPG gas and Natural Gas installations including ancillary equipment, valves and storage cylinders tested and certified	CSA B149.1-M95	Provincial Gas inspector	Gas permit Final
<b>(I) Fire Pressure Pumps</b>			
Fire pressure pumps	NFP 20 Standard	factory tested and certified by pump manufacturer	
<b>(j) Cold Water Pressure Pumps</b>			
Cold water pressure pumps	Relevant CAN/CSA Standard	factory tested and certified by pump manufacturer	
<b>(k) Hot Water Circulation Pumps</b>			
Hot water circulation pumps	CSA Z317.2-01	factory tested and certified by pump manufacturer	

Criteria/ Standard	Authority Approvals	Test Parameters
<p><b>(l) Hot Water Units</b> Start up and test boilers at rated load under supervision of boiler manufacturers representative</p>	<p>British Columbia Safety Authority.</p>	<p>1. carry out boiler flue analysis noting CO<sub>2</sub> and O<sub>2</sub> in the flue gas</p> <p>2. test operation of automatic combustion controls by separately operating all safety and operating devices on the boiler.</p> <p>3. test flame failure relays:</p> <ul style="list-style-type: none"> <li>• shut off gas or oil supply to simulate loss of fuel supply</li> <li>• remove scanner eye to simulate flame of pilot failure</li> <li>• check that operating and safety devices function correctly and in correct sequence.</li> </ul> <p>4. check setting and operation of safety thermostats - set thermostats at 3<sup>0</sup>C above normal operating temp</p> <p>5. check setting and operation of:</p> <ul style="list-style-type: none"> <li>• Storm water systems and pumps</li> <li>• Sanitary waste system and pump</li> <li>• Specialty Plumbing Systems</li> <li>• Sprinkler and standpipe fire protection systems</li> <li>• Domestic water systems</li> </ul>
<p><b>(m) General</b> Air equipment to be tested for satisfactory operation</p>	<p>As per code and manufactures requirements</p> <p>CSA Z317.2-01</p>	<ul style="list-style-type: none"> <li>• general testing to be undertaken for any abnormalities for vibration and noise. Usual operation in rotating machinery shall be corrected and re balanced if appropriate.</li> <li>• the required laminar air flow characteristics are met</li> <li>• pressure differential are set up and that migration is always in the directions specified</li> <li>• To have 24 hour service from the mechanical system – check operability</li> </ul>
<p>Computer Equipment, MDF/PABX Room(s)</p>		

	<b>Criteria/ Standard</b>	<b>Authority Approvals</b>	<b>Test Parameters</b>
Refrigerant Qualities	Ozone Depletion	Montreal Protocol	<ul style="list-style-type: none"> <li>• &lt;0.055</li> </ul>
	Global Warming		<ul style="list-style-type: none"> <li>• &lt;0.37</li> </ul>
<b>2.3 Test to Manufacturers Recommendations</b>			
Medical gases and compressed air system	CSAZ305.1-M	CSA Independent Testing Agency & AHHC Anaesthetist Rep	<ul style="list-style-type: none"> <li>• Each valve, alarm and outlet to be tested to manufacturers recommendation and test results recorded</li> </ul>
Specialist exhaust system	CSA Z317.2-01		<ul style="list-style-type: none"> <li>• test to manufacturers recommendation and record results</li> </ul>
Fume cupboards fume extraction systems	CSA Z317.2-01		<ul style="list-style-type: none"> <li>• test to manufacturers recommendation and record results</li> </ul>
Theatre ventilation system	CSA Z317.2-01		<ul style="list-style-type: none"> <li>• Smoke test to identify efficiency of air flow and exhaust system. Check air pressure to design standard. Check temperature and humidity controls as per Appendix 4 and 10 and record all results.</li> </ul>
Building automation systems			<ul style="list-style-type: none"> <li>• test to manufacturers recommendation</li> <li>• Illustrate the Systems general Function: <ul style="list-style-type: none"> <li>• Full control &amp; monitoring of mechanical services;</li> <li>• Control and/or monitoring of selected systems of electrical, fire &amp; plumbing services;</li> <li>• High level interface with security system • <ul style="list-style-type: none"> <li>Recording and presentation of energy use and operating levels for selected mechanical and electrical plant;</li> </ul> </li> </ul> </li> </ul>
Medical waste disposal system	CSA Z318.3-95		<ul style="list-style-type: none"> <li>• test to manufacturers recommendation</li> </ul>

	Criteria/ Standard	Authority Approvals	Test Parameters
<b>2.4 Performance Tests</b>			
<b>(a) Water Heating Systems</b>			<ul style="list-style-type: none"> <li>capacity of each unit tested by measuring air temperatures rise and water flow rate</li> </ul>
<b>(b) Air Cooling Systems</b>			<ul style="list-style-type: none"> <li>the capacity of the cooling coil tested by measuring air total heat difference and air flow. Refrigeration, compressor capacity shall be read from manufacturer's rating information using motor electrical consumption</li> </ul>
<b>(c) Air Heating Systems</b>			<ul style="list-style-type: none"> <li>capacity of air heating units tested by measurement of air temperature rise and air flow rate.</li> </ul>
<b>(d) Controls</b>			<ul style="list-style-type: none"> <li>operating pressures, temperatures and humidity to be tested under operating conditions</li> <li>the set point in differential operating range of each control element shall be recorded. The recorded readings shall be entered on the "as installed" control drawings &amp; NEBB Sheets</li> </ul>
<b>3.0 Electrical Services</b>			
<b>3.1 General</b>			
	Canadian Electrical Code, IEEE Standards, CSA Standards	Government of BC Safety Branch, Local Authority requirements and BC Building Code	<ul style="list-style-type: none"> <li>Coordination study completed for all circuit protection devices.</li> <li>Test all metering and energy monitoring.</li> <li>all circuit protection, control and operating devices have been verified for correct adjustment and rating capacity before commissioning. Certificate from all approval authorities provided.</li> </ul>
<b>(a) Electrical System</b>		Independent Certifier	<ul style="list-style-type: none"> <li>tests which are necessary to place the electrical system into general purpose use shall be witnessed and record documents signed by Project Co, and the Independent Certifier before Substantial Completion is granted</li> </ul>

	<b>Criteria/ Standard</b>	<b>Authority Approvals</b>	<b>Test Parameters</b>
<b>(b) Plant &amp; Equipment</b>		Factory test certificates	<ul style="list-style-type: none"> <li>• have authorised manufacturers representative present on site to inspect, check and approve equipment installation and start up and oversee commissioning. Manufacturers representative to certify that Plant and Equipment has been commissioned and available for immediate service.</li> </ul>
<b>(c) Sub Station and HV Cabling</b>	CSA Z32.4 & IEEE Standards	supply authority contractor	<ul style="list-style-type: none"> <li>• type test certificates inclusive of fault rating capacity for transformer, HV &amp; LV switch gear transformer damage curve, cable insulation resistance testing and Hipot testing. Test results to be recorded &amp; authority approvals provided for certifier.</li> </ul>
<b>(d) Main Switchboard</b>	Relevant CAN/CSA Standard & IEEE Standard		<ul style="list-style-type: none"> <li>• type test certificate of construction inclusive of fault rating capacity and insulation tests site testing of A.C.B.'s inclusive of electrical interlocks, protection relays for over current and voltage parameters, instruments energy management, etc.</li> <li>• Provide current injection tests for all relays</li> </ul>
<b>(e) Thermal Scan Testing</b>			<ul style="list-style-type: none"> <li>• The main Switchboard, sub installation main switchboards and distribution switchboards including all busbars, isolating links, switches, circuit breakers and cable joints shall be given a thermographic survey using an approved calibrated infrared sensitive camera. This must be done when the building is under load and must be completed after building Substantial Completion.</li> </ul>
<b>(f) Emergency Power/Generator</b>	CEC, CSA Z32.99 & IEEE Std.602-1996		<ul style="list-style-type: none"> <li>• factory testing of assembled unit to rating capacity (minimum of 65% of total Facility demand), frequency and voltage parameters, automatic starting and acoustic levels;</li> <li>• On site Stepped Load Bank test over 8 hours to 110% generation capacity on each generator</li> <li>• site commissioning of standby fuel systems, automatic start and delayed</li> <li>• test all alarms, signalling, start up and automation;</li> <li>• test all metering</li> </ul>

	Criteria/ Standard	Authority Approvals	Test Parameters
	CSA Z32-99 STD		<ul style="list-style-type: none"> <li>• shut down, full load testing and voltage regulation under installed conditions. Test and record all major essential areas requiring supply (both day and night), including:                             <ul style="list-style-type: none"> <li>• Essential admin systems, eg Nurse Call, Paging,</li> <li>• Essential building services, eg FIP, Fire Pump, Fire Paging</li> <li>• Delayed essential services such as elevators, mechanical systems,</li> <li>• Conditional systems such as food services</li> </ul> </li> <li>• The Following departments covered by the CSA Z32.99STD will remain operational:                             <ul style="list-style-type: none"> <li>• Operating Theatres</li> <li>• All Patient Care Spaces</li> <li>• Emergency Diagnostics</li> <li>• CT Scan</li> <li>• CSD</li> <li>• Other Areas as determined necessary by BC Building Code</li> </ul> </li> </ul>
<b>(g) Distribution Boards</b>	CEC, BC Building Code, CAN/CSA Standards		<ul style="list-style-type: none"> <li>• Type test certificate for busbar chassis and all associated equipment installed</li> <li>• Load balance test. This test must be completed after the building is under load and therefore must be completed after Substantial Completion.</li> </ul>
<b>(h) Luminaries including Emergency Lighting</b>	CEC, BC Building Code, CAN/CSA Standards		<ul style="list-style-type: none"> <li>• photometric performance data certificate along with actual illuminance levels. Lighting Control design criteria and tests identifying compliance with that design.</li> </ul>
Emergency Lighting	CSA Z32-99, BC Building Code.		<ul style="list-style-type: none"> <li>• Tests indicating performance, light levels during power outage in and confirmation of exiting requirements</li> </ul>
Seismic Requirements	BC Building Code	BC P. ENG SCH C	<ul style="list-style-type: none"> <li>• Copies of seismic installation certificates</li> </ul>
Power Quality	IEEE Standards 519, 1250 1346 & 1159		<ul style="list-style-type: none"> <li>• Harmonic and power disturbance reports detailing compliance with standards during <b>actual operating conditions</b>. This work must be completed after the</li> </ul>

	<b>Criteria/ Standard</b>	<b>Authority Approvals</b>	<b>Test Parameters</b>
			building is under load therefore must be completed after Substantial Completion.
Internal Lighting Controls	CEC, BC Building Code and ULC Standards		<ul style="list-style-type: none"> <li>Compliance with design requirements, dimming system compliance with design, day lighting and occupancy control requirements</li> </ul>
Internal Lighting Levels	IESNA – CP29 & CAN/CSA Z317.5		<ul style="list-style-type: none"> <li></li> </ul>
External Lighting Levels Carparking & Road Lighting	IESNA – CP29 & CAN/CSA Z317.5		<ul style="list-style-type: none"> <li>External lighting levels to be tested during (night) hours. Levels to be recorded at intervals within the car park, exterior walkways, road ways and entrances</li> </ul>
Lighting Energy Consumption	IESNA – CP29 & CAN/CSA Z317.5		<ul style="list-style-type: none"> <li>Copies of proposed energy consumption records provided.</li> </ul>
<b>(i) Uninterrupted Power Supply (UPS)</b>			<ul style="list-style-type: none"> <li>factory testing of assembled unit at rated capacity for continuous operation in normal, UPS and by pass mode. Testing of standby time at design capacity. Functional and performance testing to manufacturer's recommendation. Battery life to be tested and results recorded.</li> <li>Operation with IT plus upload without interruption and battery time</li> </ul>
<b>(j) Lightning Protection System (if any)</b>	CEC		<ul style="list-style-type: none"> <li>tested to manufacturer's requirements, withstand tests, ground resistance tests</li> </ul>
<b>(k) General</b>			
Cabling	CEC		<ul style="list-style-type: none"> <li>basic insulation resistance testing and ground resistance testing</li> </ul>
Power Outlets			<ul style="list-style-type: none"> <li>all and outlets shall be tested for correct operation, circuit polarity and switching only through active conductors.</li> </ul>
Appliances			<ul style="list-style-type: none"> <li>Appliances supplied and connected shall be tested in all</li> </ul>

	Criteria/ Standard	Authority Approvals	Test Parameters
			modes of operation
<b>(l) Patient Care Wiring Testing</b>	CEC, CSA Z32.99, BC Building Code		<ul style="list-style-type: none"> <li>comply with all tests in CSA Z32.99</li> </ul>
Grounding & Bonding	CEC, CSA Z32.99, BC Building Code		<ul style="list-style-type: none"> <li>the total grounding &amp; bonding system including HV shall be tested and results recorded. Step and touch potential, ground resistance testing and all equipment grounding.</li> </ul>
<b>(m) Technology and Communications Systems</b>			
Integration With Health Authorities	IEEE, CSA, EIA/TIA & BICSI Standards	Independent Certifier	<ul style="list-style-type: none"> <li>Technology and Communications Systems fully integrate with FHA and BCCA/PHSA systems. As per the proposed design.</li> </ul>
<b>(n) Patient Entertainment System</b>			
			<ul style="list-style-type: none"> <li>The Patient Entertainment system and distribution network shall be tested, noting off air launch levels and outlet received levels.</li> <li>Proof operation of system including all programming and user interface operation.</li> <li>All testing relating to Patient Entertainment will be done after Substantial Completion.</li> </ul>
Network Interface			<ul style="list-style-type: none"> <li>Test systems integration on network though operational testing.</li> </ul>
Nurse Call System	CSA Z32.99	Installer Certificate, FHA/BCCA Staff	<p>Demonstration of Nurse Call System to indicate compliance with design intent and demonstrate operationally the following:</p> <ul style="list-style-type: none"> <li>integrate with Meditech and CAIS to allow automatic call up of the patient record on Nurses wireless devices;</li> <li>Interface with wireless communications system;</li> <li>Check Ward operation in relation to:                             <ul style="list-style-type: none"> <li>Fire Mode;</li> <li>Staff Emergency;</li> <li>Assistance Call;</li> <li>Bathroom Call;</li> <li>Normal Patient Call</li> <li>Priority Patient Call</li> <li>Staff Presence (if required)</li> </ul> </li> </ul>

	Criteria/ Standard	Authority Approvals	Test Parameters
			<ul style="list-style-type: none"> <li>• Check General operation in relation to:               <ul style="list-style-type: none"> <li>• clean room call;</li> <li>• porter call.</li> </ul> </li> <li>• Check Annunciator Panels/Monitors for each call that::               <ul style="list-style-type: none"> <li>• room name is identified;</li> <li>• room number is identified;</li> <li>• nature of call is identified;</li> <li>• specialist call;</li> <li>• hierarchy of call is correctly listed;</li> <li>• calls able to be cancelled at source;</li> <li>• display of at least three calls simultaneously;</li> <li>• calls to be recorded on management software.</li> </ul> </li> <li>• Interface               <ul style="list-style-type: none"> <li>• check interface with fire alarm system;</li> <li>• provision of logging calls - type and time;</li> <li>• wireless system - receiving calls;</li> <li>• wireless system - logging messages, type and time;</li> <li>• Information systems (if required).</li> </ul> </li> </ul>
Video Conferencing(Category B1 equipment)	IP Video Conferencing Standards		<ul style="list-style-type: none"> <li>• Test all systems for proper operation.</li> <li>• Test audibility, video quality and broadcast quality.</li> <li>• Test control system functionality.</li> <li>• Test interface to other medical equipment, networks.</li> <li>• Test operation of Digital OR's, Radiology rooms, PAC's transmission.</li> </ul>
Cabling	TIA/EIA Standard, BC Building Code		<ul style="list-style-type: none"> <li>• Check and report that data outlets have been installed in accordance with the room data sheet for all areas within the Facility</li> <li>• Test each data point at random to ensure that they are operational and compliant with Canadian and Industry Standards</li> <li>• Check that vertical cabling conforms with all Design Data</li> </ul>

Criteria/ Standard	Authority Approvals	Test Parameters
		<p>reviewed and accepted by independent certifier pursuant to the Review Procedure</p> <ul style="list-style-type: none"> <li>• Check that all lines are labelled, correct panelling documentation exists within the communications room;</li> <li>• Check that all rooms that have cable system drops shall have at minimum 10% additional drops, all conduit pathways shall have minimum 100% spare capacity, and all communication rooms shall have 500% spare capacity;</li> <li>• Check that a minimum of 200% spare fibre strand terminations in each communication room have been provided;</li> <li>• Check that 100% spare capacity has been provided in each Communications rooms for Multi-conductor twisted pair telephone style riser cables and multi-standard fibre cables;</li> </ul>
Doctors Registry		<ul style="list-style-type: none"> <li>• Not Required</li> </ul>
Timing Systems		<ul style="list-style-type: none"> <li>• Check locations for timing systems;</li> <li>• Check timing systems for accuracy across entire hospital;</li> <li>• Check timing systems on power failure</li> </ul>
Patient Monitoring	TIA / EIA standards	<ul style="list-style-type: none"> <li>• Check location for each monitoring unit complies with all Design Data reviewed and accepted by Health Co pursuant to the Review Procedure;</li> <li>• Check monitoring system is performing as per manufacturers recommendations.</li> <li>• Check connectivity and interface with other Health systems [OPEN – Vague – Health Co to clarify]</li> <li>• Check monitoring within departments at AHCC.</li> <li>• .</li> </ul>
Central Dictation		<ul style="list-style-type: none"> <li>• Check that telephone system allows staff the ability to dictate onto the central FHA / BCCA dictation systems;</li> <li>• Check that the dictation system can be accessed via a code will be needed to retrieve the system;</li> <li>• Check that all dictation stations have been provided with a full featured phone and connection to the PABX via the</li> </ul>

	<b>Criteria/ Standard</b>	<b>Authority Approvals</b>	<b>Test Parameters</b>
			structured cabling system.
<b>3.2 Fire Detection System</b>	CSA C22.1, CEC, BC Building Code, CAN/ULC S524 & S537,	tested by Government of BC Safety Branch, Local Authority & Local Fire Service  Certificate of Installer	<ul style="list-style-type: none"> <li>the whole of the fire detection system (not limited the main, sub indicator panels, smoke and thermal detectors) shall be checked and tested for intent to the BC Building Code</li> <li>verification report required demonstrating that equipment has been properly installed and is functioning to its intended purpose as per ULC Standards manufacturers recommendations.</li> </ul>
<i>Specific Testing</i>			
The following tests will be conducted by the Constructor but will not be limited to:			All tests are to be recorded and monitored for performance.
System Wiring			Open and shorted speaker lines
System Indications			Correct function of all devices Correct indication at each panel Correct indication at the graphic annunciator Correct Alert Evacuate signals indicated at the main fire alarm panel for each control panel operation.
Emergency Warning Functions			Correct Alert Evacuate signals indicated at the main fire alarm panel in the Automatic mode of Operation; Correct indication at each annunciator  Sound pressure level of the audible signals in compliance with the relevant codes.
Battery and Battery Charger Capabilities			Mains power to be disconnected from complete system for 24 hours. An alarm condition to be created and the system shall power the full evacuation load for 1.5 hours. Mains power to be restored for twenty four hours, the system battery voltages and charging currents shall be checked.

Criteria/ Standard	Authority Approvals	Test Parameters
Output Relays		Check and record all fire door operation in fire mode. Record all results. Check interface and annunciation to all relevant systems.
Compartmentisation		Check and record all fire door operation in fire mode. Record all results.
<b>3.3 Training</b>		
General	Independent Certifier	operation and maintenance Manuals review contents with staff in detail.
Operation	Independent Certifier	explanation to staff of purpose, function and operation of installations.
Maintenance		explanation to staff of purpose, function and operation of installations.
Demonstrators		qualified manufacturer's representatives
Seasonal Operation		for equipment requiring seasonal operation, demonstrate the use of the equipment prior to Substantial Completion
<b>4.0 Security Services</b>		
Security System		the system shall be progressively inspected during the construction phase and tests undertaken before Substantial Completion.  Substantial Completion tests shall include an exhaustive test on a point by point basis for each item of equipment. On completion, full system tests shall be conducted on a completely configured and programmed system Health Co. to forward programming requirements to Project Co. prior to the start of commissioning.

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Criteria/ Standard	Authority Approvals	Test Parameters
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**Check and Confirm Operation of:**

Card Readers  
Electric Locks  
Duress Alarms  
Release Switches on manual Door Operation;  
Vehicle Boom Gates;  
Break Glass Detectors (if any);  
PIR Detectors (if any)  
Security Key Pad (if any);  
CCTV Surveillance System – ‘real time’ video recording capabilities and viewing;  
Test all CCTV cameras including presets/pan tilt zoom and alarm system interface;  
Test digital video storage system.

**Mental Health**

Electric Locks - Staff Base Control;  
Doors Opening in Fire Mode;  
Drug Cupboard Opening without authorisation on Nurse Call System

**Security Capability and Demonstration of:**

Display the location and time of activation of all alarms registered on the system;  
Display the names of **all persons** whose card keys are used to activate readers;  
Relay of alarms to wireless staff communication system;  
That card readers can be programmed to Health Co’s requirements;  
Logged activity information on computer database with the ability to display information:  
ability to archive all displayed data;  
ability of data logger to include:  
Time of each event;  
Date of each event;  
Identity of each card holder.

	Criteria/ Standard	Authority Approvals	Test Parameters
<b>5.0 Communication Service &amp; Information Technology</b>			
<b>5.1 Communication Services</b>			
	CSA Standards, IEEE Standards 802.1 & 802.3, BICSI and EIA/TIA standards	Independent certifier	All communications systems (including nurse call system shall be progressively inspected during the construction phase of the project. Full system testing shall be conducted before Substantial Completion. Tests shall comply with detailed design, trade specifications, relevant building codes. Check communication systems with mobile Ambulance.
Telephone System			<p>Check and report on:</p> <p>Capacity of PBX:                      minimum incoming service connectivity to match MSA PBX at time of completion plus any additional requirements to support this new facility and 10% spare;                      All locals to support all telephones and PDA's identified in the equipment schedule both wired and wireless plus 10% spare;                      All single line sets identified in the equipment schedule, plus 5% spare;                      All multiline sets identified in the equipment schedule, plus 5% spare;                      100 analog ports for specialized equipment such as fax, modem, identified in equipment schedule, plus 5% spare;                      Voice mail system with sufficient mailboxes for all Health Co and Project Co users plus 20% spare;                      Box standard features to include, automatic day light savings time collection, automatic route selection, account code dialling, call detail recording, call forwarding, call display, call park, call pickup, service restrictions, conferencing, distinctive ringing, do not disturb, hunt, holiday mode, paging, privacy, power failure recovery, recall, speed dial, hands free and several programmable options;                      Voice mail standard features, call logging, announcement only, broadcast message, call sender, service class restrictions, distribution lists, forwarding, header, lockout message writing indication, multiple languages, multiple greeting, passwords, out calling and full administration;                      Capability to interface with NEC NEAX 2400 series and the Nortel Meridian 1 series.</p>

Criteria/ Standard	Authority Approvals	Test Parameters
		<p>Ability to provide:                      internal/external call transfer                      inter site networking providing free access between FHA sites                      integrated attendant console &amp; directory                      central centre facility                      call centre facility                      auto attendant facility                      music on hold                      voice mail                      TIMS or call accounting                      Capability to night switch to other FHA sites                      Capability to transfer calls received by attendant:                      internal                      to other sites                      to pages                      to mobiles                      to predetermined numbers                      reporting features</p>
Network Equipment		<p>Check all PC components are in position and connected to network equipment;                      Check ability to log on to LAN network                      Check network connections and ability to access FHA/BCCA systems where required                      Check access to internet/intranet services This work will be done after Substantial Completion.                      Check all facility systems that are connected to network for operation access to the network.</p>
<b>6.0 Building &amp; Loose Furniture &amp; Equipment Items</b>		
(a) Compliance with design concept – Bid Proposal		submit survey plans to confirm construction of facility within existing boundaries
(b) Security fences		check and confirm that security fences comply with consultant and manufacturer’s specifications and do not have any gaps of missing fixtures
(c) Doors and locks		check keying and associated equipment to confirm correct

Criteria/ Standard	Authority Approvals	Test Parameters
		installation and operation in compliance with manufacturer's specification
		Demonstrate the operation of the Keying System as designed and endorsed
(d) Built in and fixed FF&E		check and record that all items scheduled meet compliance/standards and are to be in place before Substantial Completion and have been delivered and are in position  Asset numbers are installed and are correctly categorised.
(e) Doors, gates and roller shutters		check operation and installation – record results
(f) Kitchen equipment	local health surveyor	check installed properly and functional – record results
(g) Operation and Maintenance Manuals		provide those sections of the final draft operation and maintenance Manuals which are necessary for Project Co and the Service Providers to undertake commissioning.
(h) Landscape Design & Construction		Check landscape design complies with all Design Data reviewed and accepted by Health Co pursuant to the Review Procedure and Governmental Authority requirements; Test Watering System to ensure that no leaks are present Water Pressure is capable of delivering constant water flows Grounds are clean and free from rubbish and debris
(I) Signage		Check and Confirm that all signage Internal and External complies with all Design Data reviewed and accepted by Health Co pursuant to the Review Procedure and meets the requirements of users
(j) Mill work	Relevant CSA Standards	Check and Confirm that all millwork complies with the endorsed plans and is installed to Manufacturers Specifications

	<b>Criteria/ Standard</b>	<b>Authority Approvals</b>	<b>Test Parameters</b>
(k) Bed Cubicle Tracks, IV Tracks and Ceiling Mounted Patient Lifting Devices	Relevant CSA Manufac. Recom.		Check and Confirm that all bed cubicle tracks comply with the endorsed plans and is installed to Manufacturers Specifications and FHA/BCCA Requirements
(l) Reverse Osmosis Unit	Relevant CSA Manufac. Recom.	Renal Biomedical Technician – FHA Installer Certificate	Check and Confirm that the unit complies with the endorsed plans and is installed to Manufacturers Specifications. Check that water pressure is to appropriate standards and filtering capability meets appropriate standards. Project Co to have provide the necessary instruction to staff for the operation of the equipment. .
(m) Thermostatic Mixing Valves (if any)	Relevant CSA Standards, FHA Guidelines.		Check and Confirm that each TMV installed as identified on the endorsed plans. Each TMV should be labelled and correctly identified. Temperature for water at each TMV should be: Public/Patient Areas 60°C and Staff Areas 60°C
(n) Building Management System	Relevant CSA Standards		<p>Check and Confirm that the BMS is installed and complies with all Design Data reviewed and accepted by Health Co pursuant to the Review Procedure. That its ability to report nominated alarms and interface with the paging system is demonstrated as listed below:</p> <p><b>Equipment</b>                      Lab and pharmacy refrigerator temperature                      Mortuary cabinet temperature                      Mortuary cabinet status                      Mortuary cabinet failure alarm                      Cool room temperature                      Cool room status                      Cool room failure alarm                      Steam generator steam pressure                      Steam generator fault.</p> <p>That the BMS is able to provide commands to each of the control point positions and the response of each point to commands is demonstrated. Check that the system has the installation for the</p>

	Criteria/ Standard	Authority Approvals	Test Parameters
			additional 20% monitoring points, plus its ability to expand in future.
(o) Intercoms	Relevant CSA Standards Manu. Guidelines		Check and Confirm that: private communication between any two stations is possible; calls from Intercom to Intercom is possible; ability to make paging calls from one or more zones is possible.
(p) Elevators	CAN 3-B44, BC Building Code & Manu. Guidelines	Installer Certificate	Check and Confirm that the elevator installation complies with all Design Data reviewed and accepted by Health Co pursuant to the Review Procedure; That the elevator operating speed is consistent and meets design criteria and all Design Data reviewed and accepted by Health Co pursuant to the Review Procedure; Ensure that lift levelling meets design criteria of +/- 6mm and all Design Data reviewed and accepted by Health Co pursuant to the Review Procedure; Demonstrate the effective monitoring of the security system; Simulate the operations of the elevator under emergency power and ensure that it meets design criteria and all Design Data reviewed and accepted by Health Co pursuant to the Review Procedure; Demonstrate the recall of elevators for emergency or other required situations and ensure that the response is within the design requirements
(q) X ray Viewers	Relevant CSA Standards Manu. Guidelines	Department Manager	Check and Confirm that the X ray viewers provide sufficient light output to enable the viewing of X rays without difficulty
(r) Radiation Safety	Radiation Safety Guidelines – Federal & Provincial	Physicist - Radiation Expert, Manufacturer/Supplier acceptance testing, FHA Radiologist/BCCA Physicist	Check and Confirm that the Medical Imaging fitout and internal linings complies with the Federal and Provincial Guidelines Radiation Safety and that installation has been completed to this standard; Ensure that Linear Accelerators are installed and capable of commencing operation. Check radiation levels and record during commissioning of imaging equipment

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	<b>Criteria/ Standard</b>	<b>Authority Approvals</b>	<b>Test Parameters</b>
(s) Sterilising Equipment	Relevant CSA Standards Manu. Guidelines	Department Manager Installer Certificate	Check and Confirm that all sterilising equipment has been installed as indicated in the endorsed plans Check operation of each by demonstrating the operation of unit and recording time and temperature levels reached Check operation of each bed pan steriliser by demonstrating the operation of unit and recording time and temperature levels reached
(t) Boom Gate Operation	Relevant CSA Standard Manu. Recomm.	Installer Certificate	Check operation of each boom gate to ensure that the card reading machine reads the access card and gate opens automatically, raised to allow vehicle to enter carpark. Boom gate close after vehicle entry; Turn off boom gate and test manual operation in emergency operation.

## Appendix 2 Equipment List

The Equipment List is per Schedule 7 of the Output Specifications until subsequently revised pursuant to Section 21 of the Project Agreement and the Review Procedure.

**Appendix 3 Operational Readiness Simulations**

[Appendix 3 follows this page.]

Tests identified in this Appendix 3 as being conducted after Substantial Completion will not form part of the Substantial Completion requirement.

**ABBOTSFORD HOSPITAL AND CANCER CENTRE  
OPERATIONAL READINESS SIMULATIONS**

Test Performed	Expected Result	Pre Substantial Completion	Post Substantial Completion
(a) Check Performance Monitoring Program that it captures the following information:			
(i) unique incident number	Verify recording		X
(ii) date & time of incident and when Facility Services return to compliance	Verify recording		X
(iii) date & time notification received	Verify recording		X
(iv) date & time of response	Verify recording		X
(v) date & time of rectification	Verify recording		X
(vi) nature of incident	Verify recording		X
(vii) location of incident	Verify recording		X
(viii) Functional Area is located	Verify recording		X
(ix) Time of any failure to respond or failure to rectify	Verify recording		X
(x) Level of incident determined in accordance with the Project Agreement	Verify recording		X
(xi) how Project Co became aware of the incident	Verify recording		X
(xii) the name and contact details for the person notifying the incident	Verify recording		X
(xiii) action taken to remedy each incident	Verify recording		X
(b) Ability of PMP to generate Monthly and Daily Reports	Verify recording		X
<b>Help Desk Services</b>			
(a) establishment of a Help Desk capable of recording and responding to all	physical establishment of a Help Desk and availability		X

Test Performed	Expected Result		
		Pre Substantial Completion	Post Substantial Completion
communications	to respond		
(b) Provision of system(s) capable of receiving, logging and responding to all communications – ring through a number of calls and check recoding system as per Output Specifications	communications can be properly received, properly logged by the operator and response to incident put in place		X
(c) Help Desk available 24 hours/7 days per week – ring through to Help Desk at various hours to confirm availability	systems in place to provide around the clock cover		X
(d) Ability to deal with a number of communications at the same time – ring through four calls, email and fax at one time	All communications are answered within the specified time lines as prescribed in the Output Specifications		X
<b>Communications</b>			
(e) test phones randomly throughout the Facility:	call made	X	
(i) make call from test phone to an internal number	call made	X	
(ii) make call from test phone to local number	call made	X	
(iii) make call from test phone, long distance (Canada, Overseas)	call made	X	
(iv) make call from internal phone to test phone	call made	X	
(v) check all PABX functions for operability and to meet Health Co requirements as defined in the Output Specifications	PABX functional to Health Co requirements	X	
(vi) elevator telephone connects to Help Desk for emergency communications – call Help Desk from elevator phone	all made to Help Desk	X	
<b>Security</b>			
(f) conduct an emergency evacuation of the Facility	security services assist in evacuation in line with the procedures Manual		X

Test Performed	Expected Result		
		Pre Substantial Completion	Post Substantial Completion
(g) request for security support:	Response is in accordance with operating Manual		X
· Emergency Department			X
· Mental Health Area			X
· Administration			X
(h) test all CCTV – identify:	Response is in accordance with operating Manual		X
· potential break in			X
· potential car theft			X
· assault			X
(i) test access and locks randomly and ensure that each is programmed to allow:			
· full access to areas where required	Access to all areas as required	X	
· limited access to areas where required	Access to area specified only	X	
· check pharmacy access requirement	No access to pharmacy – only pharmacist	X	
· change access requirements	Programmed change meets access requirements	X	
(j) Scenario test/emergency/incident response			
· minor fire incident	Security service attendance and assistance		X
· hostage situation	Response is in accordance with operating Manual		X
· lost patient	Response is in accordance with operating Manual		X
· lost child	Response is in accordance with operating Manual		X

Test Performed	Expected Result		
		Pre Substantial Completion	Post Substantial Completion
· equipment reported stolen	Response is in accordance with operating Manual		X
· escort duty staff member (after hours)	Response is in accordance with operating Manual		X
<b>Car Parking</b>			
(k) [*Reserved]			
(l) drive into staff car park:			
Entry – card access for entry	Card allows access	X	
· boom gate operates	Boom gate operates	X	
· record name and time details of entry	Staff details are recorded as required		X
Exit – card access for exit			
· boom gate operates	Boom gate operates	X	
· record name and time details of exit	Staff details are recorded as required		X
<b>Cleaning</b>			
Internal			
Room Set Up	Staff respond and set up as required.		X
Urgent Cleaning required in Operating Theatre	Cleaning staff respond as required		X
Schedules prepared and available	Cleaning staff are ware of Schedules and duties required		X
Emergency Cleaning Response	Cleaning staff respond as required		X
Waste Management – Bins not emptied	Cleaning staff respond as required		X
<i>External</i>			
(m) large quantity of blood outside ED	Cleaning staff respond as		X

Test Performed	Expected Result		
		Pre Substantial Completion	Post Substantial Completion
	required		
(n) bins over full	Cleaning staff respond as required		X
<b>Pest Control</b>			
(o) mice seen in the kitchen - report to the Help Desk	Response is in accordance with operating Manual		X
(p) report of animal in roof space	Response is in accordance with operating Manual		X
<b>Laundry/Linen</b>			
Staff can operate the Laundry/Linen system without problems	All input is accurate and appropriate		X
Check understanding of inventory control requirements	Staff ensure that stock levels are maintained to the appropriate standard		X
Test packs for various procedures	Packs accuracy as required		X
<b>Material Services</b>			
<i>Receipt/ Dispatch</i>			
Incoming supply of drugs, sterile supplies, etc	That staff appropriately receive, record, store and dispatch goods		X
Call from Nursing Unit for immediate supply of goods	Call recorded at Help Desk, Help Desk record and advise Stores area, goods are delivered within the time requirements.		X
<i>Portering</i>			
Call made for Porter service from Nursing Unit	Porter arrives within response time.		X
Call made from Nursing Unit to pick up patient to take to morgue.	Porter arrives within response time and moves patient appropriately		X

Test Performed	Expected Result		
		Pre Substantial Completion	Post Substantial Completion
<b>Mail Service</b>			
Mail received at mail room.	Staff receive, allocate and distribute within appropriate response time.		X
Mail collection from Administration	Staff collect and dispatch as per policies and procedures.		X
<b>Signage</b>			
(q) internal signage			
(i) front door entry – follow directional signage to Ambulatory Care Center area (outpatient clinic). Then follow signage to Administration area. Then follow signage to front door exit	Able to find target areas without difficulty	X	
(ii) After hours entry – follow signage to Palliative Care Area, then Chapel, then front entry/exit	Able to find target areas without difficulty	X	
(iii) Random selection of areas to attend	Able to find target areas without difficulty	X	
(r) external signage			
(i) drive car to front entry, drop off and proceed to visitor car park	Able to drive to target areas without difficulty	X	
(ii) drive car to kitchen loading zone.	Able to drive to target areas without difficulty	X	
<b>Utilities Management</b>			
Provision of report to Health Co	Staff can accurately measure and report to Health Co of usage of utilities	X	
<b>Food Services</b>			
Appropriate patient meals are prepared by kitchen staff.	Meals meet the dietary requirements of Health Co		X
Request for ad hoc meal in Recovery	Meal prepared and delivered within the		X

Test Performed	Expected Result		
		Pre Substantial Completion	Post Substantial Completion
	response times in the Output Specifications.		
Cafeteria meals	Provided and delivered within the response times in the Output Specifications.		X
Vending Machines	Fully stocked and available for use. Dispenses the appropriate food.		X
Catering Staff aware of Policies & Procedures	All staff are aware of policies and procedures and can act in the appropriate way.		X

**Appendix 4 List of Calibration Test Benchmarks &  
Manufactures Requirements**

Project Co To Provide with draft Final Commissioning Program.

**Appendix 5 Schedule of Defects & Closing Out**

Project Co To Provide with draft Final Commissioning Program.

**Appendix 6 Commissioning Program**

Project Co To Provide with draft Final Commissioning Program.

Appendix 7 [\*Reserved]

## Appendix 8 Monitoring of Building Systems & Operations

### CRITERIA FOR MONITORING BUILDING SERVICES

To demonstrate that all Plant and other equipment relevant to building systems and operations have been operating successfully to normal working condition performance levels for at least 14 days.

Monitoring will use the existing building monitoring systems throughout the Facility and must measure part or all of the following depending on the specific area being monitored:

- Temperature – Climate Control;
- Air borne particles (dust/bacteria) measured in accordance with the applicable WCB standards;
- Air Volume - Flow Velocity;
- Operating Theatre Pressure Volumes – Smoke Testing;
- Isolation Room Pressure Testing;
- Sound Db Levels – internal and external (boundary noise measurement) (to be monitored on a random basis);
- Humidity; and
- Lighting Levels.

**Appendix 9 Occupancy Requirements**

**OCCUPANCY REQUIREMENTS  
ABBOTSFORD HOSPITAL AND CANCER CENTRE**

**Sample Certificates**

No.	REQUIREMENT
1.	A certificate from the approved testing authority stating that fire hydrants and fire hose connections achieve the required flow rates and are installed in accordance with the relevant codes.
2.	A statement from the installer of the Public Address Warning System stating that it has been installed in accordance with CSA Standards and all Design Data reviewed and accepted by Health Co pursuant to the Review Procedure.
3.	A certificate from the approved testing authority stating that smoke and thermal detectors have been installed in accordance with all Design Data reviewed and accepted by Health Co pursuant to the Review Procedure and CSA Standards, including activation of release of hold open devices for smoke and fire doors/shutters in fire mode.
4.	Confirmation from the Fire Department having jurisdiction stating that the fire annunciator panel has been satisfactorily connected to the Fire Department System and is operating as required.
5.	Fire resistance rated doors shall comply with CSA Standards and have ULC or WH approval labels attached.
6.	A letter of compliance is required from the mechanical system installer indicating that the installed mechanical services complies with all Design Data reviewed and

No.	REQUIREMENT
	accepted by Health Co pursuant to the Review Procedure, the BC Building Code and relevant codes, including shutdown mode and damper activation.
7.	A letter of acceptance for the electrical works is to be obtained from the installer indicating compliance with the relevant code, including CSA Standards.
8.	A contractor's certification is required stating that all elevators have been installed in accordance with the Elevator Specifications, B.C. Elevators Inspections Branch Regulations, CSA Standards and approved Worker Compensation requirements.
9.	Confirmation stating that all glass has been installed in accordance with CSA Standards.
10.	A certificate from the relevant mechanical contractor stating the fire dampers have been installed in accordance with the relevant Fire Test Certificates, copies of which are to be provided.
11.	Fire Protection Maintenance Log Books are required to be maintained on site for the following: <ul style="list-style-type: none"><li>• Emergency Lights;</li><li>• Exit Signs;</li><li>• Fire Hydrants;</li><li>• Fire Hose Connections;</li><li>• Sprinkler Systems;</li><li>• Emergency Public Address Systems;</li><li>• Smoke and Thermal Detection Systems;</li><li>• Fire Rated Doors; and</li><li>• Emergency Generator.</li></ul>

No.	REQUIREMENT
12.	Fire Department final approval for the issues related to their approval in accordance with any Applicable Law.
13.	Records of the structural inspections made by the Engineer(s) of Record.
14.	Written confirmation from the Constructor that the building elements as required achieve the necessary Sound Transmission Class in accordance with all Design Data reviewed and accepted by Health Co pursuant to the Review Procedure and the BC Building Code.
15.	Written confirmation from the Constructor that the required thermal insulation has been installed and complies with the BC Building Code and all Design Data reviewed and accepted by Health Co pursuant to the Review Procedure.
16.	Written confirmation from the Constructor that the relevant internal finishes installed within the building comply with the Flame Spread Ratings in the BC Building Code.
17.	Written confirmation from the Constructor and appropriate engineering reports indicating that the work complies with the seismic requirements of the BC Building Code.
18.	A Certificate of Compliance from the Plumbing contractor indicating that the work described complies with all the plumbing codes and regulations and the BC Building Code.
19.	A letter of Compliance from the electrical sub contractor indicating that the emergency and exit lighting has been installed in accordance with CSA Standards and the BC Building Code.
20.	Copy of compaction tests for soil beneath floor slabs.

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No.	REQUIREMENT
21.	Indication from Engineer(s) of Record stating the allowable live loads.
22.	Confirmation from the responsible Constructor or sub contractor regarding construction of fire and smoke proof wall construction as complying with the BC Building Code and all Design Data reviewed and accepted by Health Co pursuant to the Review Procedure.
23.	Confirmation from the responsible Subcontractor that the masonry walls have been constructed in accordance with all Design Data reviewed and accepted by Health Co pursuant to the Review Procedure or independent verification of the same.
24.	Confirmation from the responsible Subcontractor that the structural steelwork has been constructed in accordance with all Design Data reviewed and accepted by Health Co pursuant to the Review Procedure or independent verification of same.
25.	Confirmation that the medical gas systems comply with the BC Building Code and CSA Standards Z305.1-92

## **Appendix 10 Table - Testing Benchmarks**

The Parties agree that the Testing Benchmarks for the purposes of this Appendix 10 are as listed in Section E8 Plant Services of the FM Output Specifications and Project Co will provide these with draft Final Commissioning Program.

Appendix 11 – Cash Allowance Equipment – Commissioning Categories (“CC”)

**CATEGORY A EQUIPMENT COMMISSIONING CATEGORIES**

Eq No	Item Description	Qty	CC
1000	agitator, platelet	1	2
1001	air therapy unit	14	1
1002	anaesthesia patient system	12	2
1004	analyzer, blood gas	2	2
1005	analyzer, chemistry 1	1	2
1750	analyzer, chemistry 2	1	2
1006	analyzer, coagulation	1	2
1747	analyzer, coagulation back up	1	2
1011	analyzer, immunoassay tumor markers	1	2
1007	analyzer, lithium chemistry	1	2
1008	analyzer, middle ear	1	1
1009	analyzer, pulmonary function	1	2
1010	analyzer, serum	1	2
1178	analyzer, urinalysis	1	2
1012	analyzer, whole blood, cell counter	2	2
1013	angiography unit, digital	1	3
1057	arthroscope	12	1
1017	audiometer, clinical	1	2
1020	auditory brainstem response system c/w cart	1	2
1049	bipaps	4	2
1024	blood culture instrument	2	2
1054	blood fluid warmer, high flow	1	2
1794	bone densitometer	1	3
1069	cabinet, narcotic, card access	8	1
1122	cabinets, seismic 26"wx83"hx40"d	3	1
1082	camera, gamma	3	3
1084	cardioversion unit	2	3
1795	c-arm, digital full size	3	3
1085	c-arm, digital, mini	1	3
1094	cart, crash	8	2
1112	cart, medication	8	1
1087	cart, medication delivery	36	1
1122	catalyst switch	6	1
1131	cell washer	4	1
1205	cytocentrifuge	1	1

1135	centrifuge, 8 tubes	6	1
1276	centrifuge, countertop, 16 tubes, high speed, aerosol lid	1	1
1132	centrifuge, countertop, 48 tubes	3	1
1136	centrifuge, floor model, urinalysis, 16 tubes, refrigerated	1	1
1137	centrifuge, gel system	2	1
1138	centrifuge, micro hematocrit	1	1
1139	centrifuge, refrigerated floor	1	1
1140	centrifuge, specimen	1	1
1173	chloridometer	1	2
1181	communication device, augmentive	1	2
1355	computer c/w 2-21" flat panel monitors	3	1
1355	computer, associated with linac controls		4
1746	Concole, medication dispensing system	1	1
1028	contrast media IV control, remote	1	3
1122	controller, domain	1	1
1185	CORES system	2	4
1187	coverslipper/stainer combo unit	2	2
1190	CR server, QC unit	2	3
1188	CR workstation, client id	4	3
1191	CR, digitizer, multi	2	3
1189	CR, digitizer, solo	1	3
1785	Cryojane system	1	2
1197	cryostat	2	2
1202	ct/simulator, three dimensional, digital	1	4
1205	cytocentrifuge	2	1
1204	cytometer, flow, heam, immunology	1	2
1797	debrider, common, arthroscopic	1	1
1341	dictaphone	13	1
1220	dispensing unit, automated tabletop	10	1
1221	dispensing unit, automated, double stack	8	1
1222	dispensing unit, automated, single stack	7	1
1225	doppler, vascular, hand held	1	1
1229	drainage/vacuum system, wound care	4	2
1230	drill, ENT	5	1
1099	drill, ortho, battery operated	12	1
1242	ECG machine	7	2
1243	ECG machine, portable	2	2
1245	ECT machine	1	2
1250	electrosurgical unit (ESU)	1	2
1250	electrosurgical unit (ESU)	14	2
1252	embosser	5	1

1253	EMG machine	1	2
1254	endoscopic equipment	6	2
1255	endoscopic evaluation system, swallowing	1	2
1257	ENG/VNG system w/cart	1	2
1116	EP machine	1	2
1783	fluid management system, hysteroscopic	1	2
1266	fluoroscopy unit, digital	1	3
1266	fluoroscopy unit, digital	1	3
1275	gel station, automated	1	1
1292	hemodialysis machine	33	2
1294	high dose accessories	1	3
1295	high dose rate machine	1	3
1740	image guided surgical system	1	4
1311	incubator, CO2, 2 door, benchtop	1	2
1312	incubator, gel system	2	2
1314	incubator, platelet	1	2
1316	injector, contrast power, clg mtd	5	3
1496	insufflator	7	2
1186	irradiator, blood cells	1	2
1325	isolette, incubator	16	2
1326	isolette, transport	1	2
1790	isotope counter, multi-well	1	2
1331	lamp, heat	1	2
1333	laser	24	4
1334	laser, ENT	1	2
1335	laser, helium neon, therapeutic	1	2
1336	laser, infared, therapeutic	1	2
1337	laser, urology	1	2
1348	light source, cystoscopy	4	2
1355	linear accelerator c/w required software and licences	4	4
1357	lithotripsy machine	1	2
1360	Lymphapress unit	2	2
1361	mammography radiographic unit, digital	2	3
1815	metabolic exercise package	1	2
1428	microphone, dictation, wireless	2	1
1366	microscan	1	2
1367	microscope	13	1

1368	microscope, 10, 20, 50/100/oil	12	1
1369	microscope, dual head	3	1
1370	microscope, ENT/pastics	1	1
1371	microscope, fluorescent	1	1
1372	microscope, inverted	3	1
1762	microscope, PCB inspection	1	1
1375	microscope, special optics	8	1
1382	mixer, automated TPN	2	1
1383	mobilizer	1	3
1387	monitor, central for physiological monitoring system	9	2
1388	monitor, fetal	23	2
1389	monitor, physiological, mobile	4	2
1390	monitor, physiological, networked	113	2
1391	monitor, transport	8	2
1400	monitor, vital signs, portable	72	2
1393	monitoring equipment, sleep lab	2	2
1395	MRI unit	1	3
1403	oesophageal dilator set	1	2
1401	or stabilization stand	1	1
1408	oven, 37 degrees	1	1
1409	oven, 60 degrees	2	1
1413	packager, unit dose /multi-dose	1	1
1414	PACS workstation, diagnostic review	8	3
1415	PACS workstation, Radiologist	8	3
1198	Part of C4 3		1
1434	printer, cassette	1	1
1435	printer, slide	1	1
1439	probe, sentinel node detector	1	2
1441	processor, dry laser	3	3
1442	processor, tissue	3	2
1451	pump, CADD Legacy	25	2
1452	pump, epidural	28	2
1453	pump, infusion, rapid	1	2
1454	pump, infusion, single channel	184	2
1455	pump, infusion, triple channel	92	2
1456	pump, syringe	21	2
1458	r/o unit, portable	4	2
1462	radiographic unit, digital	2	3
1462	radiographic unit, digital	1	3
1462	radiographic unit, digital	1	3

1469	recycling system, solvent	1	2
1484	resuscitation unit, infant	3	2
1800	rhinolaryngoscope, flexible ENFP 4	8	2
1514	scalpel, harmonic	2	2
1511	scanner, bladder	8	2
1512	scanner, CT	2	3
1513	scanner, vidar	1	4
1516	scope system, video broncho	1	2
1517	scope system, video endo	1	2
1517	scope system, video endoscopy	1	2
1520	scope, broncho video	5	2
1519	scope, broncho, pediatric	1	2
1521	scope, colono, pediatric	1	2
1522	scope, colono, video	8	2
1524	scope, cysto rigid various	2	2
1523	scope, cysto, flexible	12	2
1526	scope, cysto, various sizes	6	2
1528	scope, gastro flexible video	2	2
1529	scope, hystero	4	2
1530	scope, laparo, 0 degree	12	2
1531	scope, laparo, 30 degree	6	2
1532	scope, laparo, 45 degree	2	2
1533	scope, laryngo, fibreoptic	1	2
1534	scope, laryngo, flexible	3	2
1536	scope, nephro, percutaneous	2	2
1537	scope, procto, set	4	2
1527	scope, rhino-laryngo-video scope	1	2
1827	scope, sigmoid	3	2
1539	scope, upper GI, pediatric	1	2
1538	scope, upper GI, various	12	2
1540	scope, ureter-renoscope, flexible	6	2
1541	scope, ureter-renoscope, rigid	6	1
1546	sedimentation rate, automated	1	2
1549	serofuge	6	1
1122	server, exchange	1	1
1122	server, file/print	1	1
1064	server, qs	1	1
1122	server, TB Imaging Cache	20	1
1559	s-frame extension	1	3
1560	s-frame overlay	1	3
1202	simulator control computers		4
1202	simulator control workstation		4

1572	simulator, 2 dimensional, digital	1	4
1816	smoke evacuation system	7	2
1816	smoke evacuation unit	8	2
1580	speaker freefield for OB922 and acoustic panels	1	2
1583	stainer	1	2
1584	stainer, immunohistochemistry	1	2
1585	stainer, slide	1	2
1586	stainer, slide automated	1	2
1616	staining unit	1	2
1224	storage system, sterile supplies	1	1
1603	storage system, stock	1	1
1122	switches/monitors/cables...	1	1
1621	table, autopsy w garburator	2	2
1630	table, fracture	1	2
1643	table, surgical	8	2
1801	table, surgical, manual	1	2
1649	telemetry system	1	2
1652	telescope, ENT, 70/30/45/0 degree set	1	2
1656	thyroid uptake system	1	2
1657	tools, prostate source handling	2	3
1658	tourniquet	6	2
1660	transport, ventilator	2	2
1483	treadmill system	2	2
1675	treatment planning system	3	4
1666	typanometer, auto	1	2
1786	ultracentrifuge	1	2
1667	ultrasonic probe cleaner, 1	1	2
1824	ultrasound unit	1	3
1669	ultrasound, hand held	3	2
1670	ultrasound, therapy, portable	2	2
1244	ultrasound/echo unit digital	9	3
1423	urological imaging system	1	3
1673	vacuum, uterine	1	1
1676	ventilator, infant	3	2
1677	ventilator, multipurpose	14	2
1694	warmer, infant	21	2
1709	waterbath, plasma thawing	1	1
1730	x-ray unit, panoramic	1	3

1731	x-ray, mobile	3	3
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**CATEGORY B1 EQUIPMENT AND COMMISSIONING CATEGORIES**

<b>Eq No</b>	<b>Item Description</b>	<b>Qty</b>	<b>CC</b>
1751	analyser, battery	1	2
1754	analyser, transistor	1	2
1752	analyzer, inductor/capacitor	1	2
1753	analyzer, safety w/ isolation transformer	1	2
1015	arm, computer, desk mounted	18	1
1015	arm, computer, wall mtd	13	1
1016	audio visual, telemedicine	3	1
1018	audiometer, screening	2	2
1019	audiometry unit, visual responses	1	2
1021	autoclave, floor units	3	1
1022	autoclave, steam	1	1
1808	balance	1	1
1788	balance, analytical	1	1
1025	balance, electronic	1	1
1026	band saw, horizontal	1	1
1027	band saw, vertical	1	1
1732	barometer, electronic	1	4
1733	barometer, nova	1	4
1029	bars, parallel, electric adult/child	2	1
1030	bars, parallel, peds size	1	1
1031	bassinette	11	1
1032	bassinette, wood	28	1
1033	bathing system, electronic hydrosound	6	2
1734	beam alignment tool	1	4
1735	beam check	1	4
1034	beam profiler and data logger	1	4
1035	bed 1	12	2
1036	bed 2	14	2
1037	bed 3	183	2
1038	bed 4	28	2
1039	bed 5	20	2
1040	bed 6	32	2
1041	bed 7	26	2
1003	bed pan flusher/disinfector	29	1
1043	bench, shielded with lead glass viewer	2	1
1044	bike, exercise upright	8	1
1045	bike, hand	1	1

1046	bike, recumbant	1	1
1047	biofeedback machines	3	2
1048	biofeedback, SEMG trainer	1	2
1050	blanket, billi	2	2
1051	blanket, cooling	3	2
1052	blood pressure apparatus c/w cuff	258	2
1052	blood pressure apparatus c/w cuff, headwall mtd	16	2
1053	blood pressure apparatus, portable aneroid c/w 3 cuffs	13	2
1062	booth, sound, audiology	1	2
1065	cabinet, bedside	293	1
1066	cabinet, bedside, wood	38	1
1090	cabinet, c/w drawers, wheeled	1	1
1829	cabinet, catheter storage	2	1
1068	cabinet, flammable safety	8	1
1072	cabinet, scope storage	5	1
1076	cabinet, warming, IV/blanket, 2 door, 74" tall	21	1
1778	cabinet, warming, IV/blanket, single door	1	1
1791	calibrator, dose	1	4
1755	camera, black and white cctv	1	1
1079	camera, digital	2	1
1832	cart with baskets	1	1
1086	cart, anaesthesia	9	1
1104	cart, arterial line	2	1
1091	cart, case	30	1
1796	cart, case maternity	38	1
1799	cart, case small	30	1
1092	cart, CDP Storage 1	10	1
1092	cart, CPD Storage 1	10	1
1111	cart, CPD Storage 2	10	1
1095	cart, crash, pediatric	1	1
1100	cart, equipment, storage	3	1
1103	cart, intubation, ENT	5	1
1106	cart, lakeside, large	94	1
1105	cart, lakeside, small	130	1
1117	cart, phlebotomy, mobile	6	1
1118	cart, plaster	2	1
1121	cart, resuscitation	22	1
1121	cart, resuscitation	3	1
1124	cart, supplies	6	1
1125	cart, suture	2	1
1126	cart, transfer	6	1
1101	cart, wire delivery	2	1

1832	cart, with baskets	2	1
1129	cctv system	20	1
1164	chair, aluminum	1	1
1142	chair, anaesthetist	7	1
1157	chair, dental	1	2
1150	chair, desk	36	1
1152	chair, EENT	1	1
1152	chair, ENT	2	1
1154	chair, guest, wood	35	1
1159	chair, patient, hi-back	184	1
1160	chair, phlebotomy	5	1
1161	chair, recliner	54	1
1162	chair, sit to stand	1	1
1163	chair, sleeping	54	1
1171	chair, whirlpool	1	1
1175	cleaner, fine lumen	1	1
1176	cleaner, ultrasonic, 1	1	2
1177	cleaner, ultrasonic, 2	1	2
1179	commode	85	1
1180	commode, shower	4	1
1757	counter, frequency	1	1
1195	crib	24	1
1198	crypts	1	1
1200	ct head and body dose phantom	1	4
1201	ct pencil chamber	1	4
1207	daily beam output check device	5	4
1826	densitometer, radiochromic	1	4
1819	desk, single, wood	33	1
1809	detector, leak (for gas)	1	4
1698	detergent dispensing system	1	1
1212	diagnostic set, infant, portable	2	1
1213	diagnostic set, infant, wall mtd	2	1
1215	diagnostic set, on service arm	9	1
1215	diagnostic set, wall mtd	161	1
1216	diodes for electrons	3	4
1217	diodes for photons	3	4
1218	dishwasher	2	1
1226	dose meter, patient	1	4
1803	dosimeter, digital pocket alarm	8	4
1236	drilling machine, belt head	1	1
1238	dryer, clothes	5	1
1240	dryer, tube (pass thru)	2	1

1241	dynamic profile radiation detector	1	4
1227	electrometer for ct	1	4
1247	electrometer, dosimetry standard	5	4
1120	electrometer, for CT pencil chamber	1	4
1249	electron density CT phantom	1	4
1817	elliptical trainer	1	1
1251	embedder, wax	3	2
1258	ergometer, arm w/table	2	1
1256	exhaust unit, elephant trunk	1	1
1262	flowmeter, medical air	171	1
1262	flowmeter, medical air	402	1
1263	flowmeter, oxygen	226	1
1263	flowmeter, oxygen	414	1
1267	formalin drum, control & dispensing unit	2	1
1271	freezer, chest domestic 25 cu ft	1	1
1269	freezer, ultralow 13 cu ft	2	1
1272	freezer, ultralow 20 cu. ft.	3	1
1273	freezer, undercounter	2	1
1274	freezer, upright domestic 12 cu ft.	2	1
1759	generator, function	1	1
1286	head/body CT phantom	1	4
1287	headlight, surgeon	14	2
1288	headset, wireless telephone	92	1
1291	heat sealer	1	1
1758	hoist and chains	4	1
1301	hydrocollator, 12 pack capacity	2	1
1302	hydrocollator, wax melting	1	1
1305	hydrotherapy tank, whirlpool, large	1	1
1306	hydrotherapy tank, whirlpool, small	1	1
1736	ic15 ion chamber for beam scanning	3	4
1303	ice machine, countertop	16	1
1304	ice machine, flaker c/w bin	12	1
1309	incubator, 30C benchtop	1	2
1310	incubator, 42C benchtop	1	2
1311	incubator, CO2, 2 door, benchtop	1	2
1313	incubator, O2, upright	2	2
1318	interferential current machine c/w suction	2	2
1322	ion chamber 0.6cc c/w cap, dosimetry standard	5	4

1321	ion chamber array for scanner	1	4
1320	ion chamber, linac, 0.6cc c/w cap	5	4
1775	ion chamber, mini	1	4
1323	ion chamber, parallel plane	1	4
1339	lathe, med precision & access	1	1
1340	lecturn	4	1
1741	lift, autopsy electric	1	1
1741	lift, autopsy electric	1	1
1342	lift, stand/sit c/w sling	21	1
1343	lifting device, patient, mobile c/w sling	8	1
1344	light 1, exam, ceiling, articulating	27	1
1346	light 3, birthing	28	1
1350	light, billi	2	1
1828	light, exam, portable	2	1
1351	light, fibre optic	1	1
1353	light, portable halogen	34	1
1352	light, surgical, single head	8	1
1354	light, surgical, two head	8	1
1349	light, wall mtd, halogen	39	1
1359	Loading Equipment	3	1
1805	lux lamp-magnifier	4	1
1364	mattress, flotation	40	1
1365	mattress, hypothermic, heating	2	1
1760	meter, capacitance	1	1
1761	meter, light (lux)	1	1
1792	meter, survey/contamination	1	4
1793	meter, survey/contamination patients	1	4
1378	microtome	8	2
1379	microwave	55	1
1380	milling machine, universal	1	1
1384	model, scale linac, tabletop	1	1
1763	multimeter	3	4
1398	neutron survey meter	1	4
1399	nitronox unit, wall mtd.	28	2
1407	oscilloscope	2	4
1806	oscilloscope, monitoring	4	1
1787	osmometer	1	2
1410	oven, tld annealing	1	1
1412	oximeter, pulse, hand held	47	2

1416	pan, splint,hydrocolator	1	2
1784	Paraffin dispensing unit	1	2
1417	Parafin bath, clinic size	1	2
1812	pass thru, stainless steel, double door	1	1
1420	phantom, radiographic contrast	1	4
1421	photon survey meter	1	4
1422	platform, c/w mat 60x84x20	3	1
1424	plinth, 40" wide, electric	1	1
1424	plinth, electric 40 inch	3	1
1425	plinth, electric, 42"	4	1
1426	plinth, electric, 49",	4	1
1429	pole, IV, mobile	197	1
1776	portal imaging phantom and software	1	4
1431	pot, lead, large	6	4
1765	power supply, DC	2	1
1766	power supply, DC, high current	1	1
1433	press, hydraulic	1	1
1767	probe, current	1	4
1768	probe, high voltage	1	4
1810	programmer, microcontroller	1	1
1448	pulleys, wall mtd, c/w weights	3	1
	(see pump, repeater)		1
1450	pump, breast	9	2
1449	pump, repeater	4	2
1457	pump, tube feed	4	2
1459	rack, clothes, mobile	3	1
1460	rack, lead apron	18	4
1461	radiation light field qa tool	1	4
1464	range c/w hood	2	1
1470	refrigerator w ice dispenser	6	1
1472	refrigerator, blood bank, double door	1	1
1473	refrigerator, domestic, 2 door	74	1
1475	refrigerator, two door glass 35 cu ft	4	1
1471	refrigerator, two door glass 35 cu ft (pass thru)	1	1
1476	refrigerator, undercounter	39	1
1478	regulator, carbon dioxide	8	4
1561	regulator, nitrogen	8	4
1270	regulator, nitrous oxide	16	1
1481	regulator, vacuum	857	1
1482	restorator	4	1
1488	rowing machine	1	1

1489	safe	2	1
1490	safe, radioactive source	1	4
1493	saw, cast	4	1
1494	saw, oscillating	3	1
1495	saw, reciprocating	3	1
1811	saw, table	1	1
1789	scale, floor unit	2	1
1818	scale, infant tabletop	2	1
1499	scale, infant w/cart	7	1
1502	scale, pediatric	1	1
1504	scale, platform digital	2	1
1745	scale, weigh beam	21	1
1505	scale, weigh, diaper	26	1
1506	scale, weigh, stand - wheelchair	4	1
1595	scope disinfectant, endoscopy	2	2
1515	scope leak test unit	1	2
1543	screeener, otodynamics OAE	1	2
1544	scrotal shielding and stand	1	1
1555	service arm, articulating, anaesthesia	2	1
1555	service arm, articulating, anaesthesia	7	1
1831	service arm, articulating, daycare	2	1
1556	service arm, articulating, nursing	5	1
1556	service arm, articulating, nursing	7	1
1557	service arm, double articulating, ICU	10	1
1122	shelving, library	1	1
1568	shield, lead	7	4
1570	shield, lead, mobile	1	4
1576	software management system	1	1
1577	solid water phantom slabs - 1	1	4
1578	solid water phantom slabs - 2	1	4
1579	solid water phantom slabs - 3	1	4
1581	sr check source - farmer	1	4
1738	sr check source - markus	1	4
1588	stair, portable	1	1
1589	staircase, exercise	1	1
1590	station, picking wall	2	1
1591	station, picking, "u" shaped	4	1
1592	station, splint, mobile	1	1
1593	sterilizer, flash, countertop	3	1
1447	sterilizer, hot bead	1	1
1447	sterilizer, hot bead	1	1
1594	sterilizer, scope	4	1

1600	stool, doctors	183	1
1601	stool, step	22	1
1602	stool, step c/w handle	60	1
1606	stretcher 1	47	1
1607	stretcher 2	179	1
1608	stretcher 3	2	1
1609	stretcher 4	5	1
1610	stretcher 5	1	1
1611	stretcher 6	4	1
1612	stretcher 7	7	1
1613	stretcher 8	2	1
1614	stretcher 9	3	1
1807	system data acquisition	1	1
1619	table, adjustable, hydraulic	1	1
1622	table, back, stls st, surgical	9	1
1627	table, egometer	1	1
1798	table, electronic work	11	1
1625	table, exam, gyne	46	1
1626	table, exam, pediatric	3	1
1631	table, hand therapy, ht adj	1	1
1632	table, height adjustable, connects to OR table	1	1
1634	table, OR, minor procedure	9	1
1635	table, overbed	408	1
1640	table, sorting, stainless steel	3	1
1641	table, stand in, electric	1	1
1644	table, treatment, electric ht adj	3	1
1645	table, wheelchair work, adj ht, hand crank	1	1
1646	table, work, ht adj, hydraulic	5	1
1647	table, workstation, stainless steel	6	1
1650	telephone, conference 1	10	1
1770	telephone, conference 2	8	1
1771	telephone, conference 3	5	1
1772	telephone, conference 4	1	1
1653	television, clg mount	37	1
1654	television, dvd c/w stand	52	1
1739	thermometer 1, digital/electronic	1	4
1769	thermometer, digital	1	4
1466	tld system, reader and tld's	1	4
1055	tnc triax ext cables (15m)	5	4
1056	tnc triax ext cables reel (20m)	3	4
1663	treadmill	4	1

1667	ultrasonic cleaner, floor model	1	1
1825	ultrasound phantom	1	4
1671	vacuum compressor, dual-function, 110 volt (for vac-loc cushion)	3	1
1743	vacuum suction, portable	3	1
1678	video conferencing 1	8	1
1678	video conferencing 1	1	1
1679	video conferencing 2 (a)	2	1
1680	video conferencing 2 (b)	1	1
1681	video conferencing 3	3	1
1681	video conferencing 3	1	1
1682	video conferencing 4	1	1
1684	voice assessment unit	1	1
1698	washer disinfecter, w/load unload module auto transport racks and carts	3	1
1699	washer, cart automated includes utensil carts	1	1
1841	washer, pasteurmatic	2	1
1702	washing machine	5	1
1703	water bath, large for S-frames	1	1
1704	water bath, small	1	1
1705	water phantom 38cmx38x38 with manual depth dose apparatus	1	4
1707	water tank scanning system	1	4
1748	waterbath	3	1
1708	waterbath, histology	8	1
1710	welder, oxy/acetylene	1	1
1711	well chamber & electrometer	1	4
1712	wheelchair	100	1
1713	wheelchair, extra wide	6	1
1714	wheelchair, lightweight, 16" w	1	1
1715	wheelchair, lightweight, 18"w	1	1
1716	wheelchair, lightweight, 20"w	1	1
1717	wheelchair, low, 16"w	2	1
1718	wheelchair, low, 18"w	2	1
1719	wheelchair, low, 20"w	2	1
1720	wheelchair, peds	1	1
1721	wheelchair, stacked	54	1
1722	wheelchair, standard, 22"w	3	1
1723	wheelchair, standard, 16"w	3	1
1724	wheelchair, standard, 18"w	3	1
1725	wheelchair, standard, 20"w	3	1