PART 1- GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises a retrofit for Correctional Service Canada, Stony Mountain Institution which includes: decommissioning and removal of one existing Walk-in Freezer, supply and installation of a replacement Walk-in Freezer, supply and installation of a second Walk-in Freezer, upgrades to an existing Cold Room including replacement of existing refrigeration equipment and other related work as described in the contract documents at Stony Mountain Institution (SMI), Building C-17, Stony Mountain, Manitoba.

.2 Work is required to be phased. Refer to Section 01 14 00 – Work Restrictions for general intent of the phasing.

1.2 CONTRACTOR USE OF PREMISES

.1 The work will be undertaken within an occupied facility. Existing operations must be continuous and unimpeded throughout the term of the project.

.2 Limit use of premises for Work, for storage and for access, to:
.1 Allow Owner occupancy.
.2 Maintain security.

.3 Co-ordinate use of premises under direction of Departmental Representative. Refer to Section 01 14 00 – Work Restrictions and Section 01 14 10 – Institutional Requirements for Contractors.

.4 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

.5 At completion of operations, condition of existing work must be equal to or better than that which existed before new work started.

1.3 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

.1 Execute work with least possible interference or disturbance to building operations, occupants and normal use of premises. Arrange with Departmental Representative to facilitate execution of work.

1.4 EXISTING SERVICES

.1 Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.

.2 Where Work involves breaking into or connecting to existing services, give Departmental Representative five (5) working days' notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to operations.

.3 Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative of findings.

.4 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility. Adhere to approved schedule and provide notice to Departmental Representative.

.5 Provide temporary services when directed by Departmental Representative to maintain critical building systems.

.6 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.

.7 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.

.8 Record locations of maintained, re-routed and abandoned service lines.

.9 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.5 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy each document as follows:
- .1 Contract Drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Reviewed Shop Drawings.
- .5 List of Outstanding Shop Drawings.
- .6 Change Orders.
- .7 Other Modifications to Contract.
- .8 Copy of Approved Work Schedule.
- .9 Health and Safety Plan and Other Safety Related Documents.
- .10 Other documents as specified.

.2 Maintain at job site, one additional set of Contract Documents:
- .1 Contract Drawings, Specifications and Addenda, which are to be used to document approved changes. This is required to facilitate preparation of As-Built Drawings as indicated in Section 01 78 00 – Closeout Submittals.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

1.1 USE OF SITE AND FACILITIES

.1 Refer to Section 01 14 10 – Institutional Requirements for Contractors.

.2 Execute work with least possible interference or disturbance to normal use of premises.

.3 Abide by project phasing requirements indicated.

.4 Maintain existing services to building and do not disrupt personnel and vehicle access.

.5 Any downtimes must be minimal and fully coordinated in advance with the Departmental Representative.

.6 Construction impact on adjacent areas must be kept to a minimum and be well coordinated in advance with the Departmental Representative to ensure ongoing activities can be accommodated.

.7 Where security is reduced by work provide temporary means to maintain security.

1.2 ACCESS AND EGRESS

.1 Refer to Section 01 14 10 – Institutional Requirements for Contractors.

1.3 SPECIAL REQUIREMENTS

.1 Perform Work in accordance with CSC Stony Mountain Institutional Technical Requirements and Section 01 14 10 - Institutional Requirements for Contractors.

.2 Site Superintendent:
.1 The General Contractor's Site Superintendent must be on site at all times for the full duration of construction.

.3 Perform Work generally during normal working hours from 07:30 to 16:30 hours Monday to Friday. Work outside of the normal working hours indicated will require approval and coordination with the Departmental Representative.

.4 Service Entrance closed between 11:00 and 13:00 hours unless arrangements are made in advance.

.5 Noise generating Work:
.1 Coordinate with and receive approval from the Departmental Representative for acceptable day and time to carry out this work which may have to be undertaken outside of normal working hours.

.6 Delivery of materials:
.1 Deliver materials from 7:30 to 16:00 hours unless otherwise approved by Departmental Representative.

.7 Allow for delays due to security protocol when Work:

.1 Interferes with security operations and,
.2 Entering and exiting the building.

.8 Access into Institution:
.1 Ingress and egress of Contractor's vehicles and personnel at site are limited to the Institution's check point.

.9 Construction Escort:
.1 Departmental Representative will provide construction escort as required.
.2 Notify Departmental Representative 24 hours in advance of escort requirement.

.10 Submit schedule in accordance with Section 01 32 16 – Construction Progress Schedule. Include detailed construction phasing requirements.

.11 Requirement for Construction Phasing:
.1 General intent:
.1 Criteria No. 1:
.1 The institution must have the ability to maintain the existing storage of frozen goods (quantity as presently stored in existing Walk-in Freezer) throughout the entire construction period.
.2 Criteria No. 2:
.1 The compressor feeding the existing Walk-in Freezer must be temporarily relocated in order to protect this part of the refrigeration system from damage that may occur during demolition and re-building of the Compressor Room, and that would then disable the Walk-in Freezer.
.2 Suggested outline of phasing for major components as per the proposed following sequence: (Contractor may propose alternatives, but these must be approved by the Departmental Representative)
.1 Owner to move all food storage out of existing Cold Room. Note that food storage in existing Walk-in Freezer (this freezer is located in Cold Room) is to remain;
.2 Remove and salvage existing eyewash and battery charging station; Temporarily relocate battery charging station and provide temporary portable eyewash;
.3 Provide refrigerated trailer rental (see below) for temporary food storage while the existing Walk-in Freezer's compressor/condenser is being moved to a temporary location; Owner to move food storage from existing Walk-in Freezer to refrigerated trailer;
.4 Remove cooler-type door to Cold Room.
.5 Temporarily deactivate existing Walk-in Freezer's refrigeration system, but leave Walk-in Freezer (located in Cold Room) in place for re-use;
.6 Temporarily relocate existing Walk-in Freezer's compressor/condenser and related refrigeration circuit

into Cold Room.

.7 Reactivate existing Walk-in Freezer's refrigeration system from temporarily relocated existing compressor/condenser;

.8 Owner to move food storage from temporary refrigerated trailer back to reactivated existing Walk-in Freezer (located in Cold Room);

.9 Discontinue refrigerated trailer rental;

.10 Construct outdoor pad and wire mesh enclosure for new Condensing Units;

.11 Demolish existing refrigeration system for Cold Room;

.12 Demolish existing Compressor Room and contents;

.13 Construct new Compressor Room and new Walk-in Freezer No. 1 (in Warehouse) complete with underfloor heating system and sprinkler system;

.14 Install new refrigeration system in Compressor Room and at outdoor pad and activate as required in order to allow activation of Walk-in Freezer No. 1 (in Warehouse); Note that activation of underfloor heating will not be required at this time, however, the system must be loaded and tested prior to installation of Freezer;

.15 Provide commissioning of Walk-in Freezer No. 1 (in Warehouse) and turn-over operation of this Walk-in Freezer (only) to the Owner;

.16 Owner to move food storage from existing Walk-in Freezer (located in Cold Room) to new Walk-in Freezer No. 1 (in Warehouse);

.17 Demolish existing Walk-in Freezer (located in Cold Room) and complete all other Cold Room demolitions; Note: this work includes mould remediation;

.18 Construct new Cold Room and new Walk-in Freezer No. 2 including underfloor heating and sprinkler system;

.19 Install new refrigeration system in Walk-in Freezer No. 2 and Cold Room and activate the underfloor heating system;

.20 Provide commissioning of new Walk-in Freezer No. 2 and Cold Room and turn operation to Owner.

.12 Requirement for Rental of a Refrigerated Trailer:

.1 It is the Contractor’s responsibility to schedule, rent and pay for rental capable of safely storing required frozen food goods.

.1 Size: to meet storing capacity of existing Walk-in Freezer;

.2 Interior Temperature: minus 25 degrees Celsius must be maintained at all times;

.3 Contractor is responsible for monitoring Refrigerated Trailer's temperature and for providing all necessary re-fueling in order to ensure uninterrupted operation;

.4 Timing and duration of rental:

.1 To be determined by the Contractor based on the Contractor’s submitted construction schedule that has been reviewed and approved by the Departmental Representative, and,

.2 Use of refrigerated trailer to be kept to a minimum time period.

.1 Use of trailer is to be only a temporary "emergency-type" measure to allow for transition period related to the temporary relocation of the existing compressor/condenser (see proposed sequence outlined above);

.2 Temporary storage of food in the trailer must be for the shortest duration possible;

.3 Contractor must undertake all necessary steps prior to de-commissioning existing Walk-in Freezer in order to ensure transition time is kept to a minimum.

.5 The Contractor would not be responsible for the movement of frozen goods in and/or out of the trailer. This task is left entirely to the Owner.

.13 Ensure Contractor personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.

.14 Keep within Limits of Work and avenues of ingress and egress access.

.15 Keep within Limits of Site.

1.4 BUILDING SMOKING ENVIRONMENT

.1 Comply with smoking restrictions. Smoking is not permitted.

1.1 INTRODUCTION

.1 To carry out an efficient operation of a penitentiary, it is absolutely necessary for civilian personnel, who are employed on the penitentiary property, to observe established rules and procedures.

1.2 ESTABLISHMENT OF REQUIREMENTS

.1 Prior to commencing work, the Contractor shall meet with the Warden or designate to discuss the nature and extent of all activities involved, and to establish mutually acceptable requirements to ensure that both the project and institution operation may proceed without undue disruption or hindrance except where unavoidable. Such requirements shall include the matters specified in the instruction as well as others peculiar to the immediate locality.

1.3 WORKING CONDITIONS

.1 Subject to Institutional Security requirements, the Warden or designate shall permit the contractor as much freedom of action and movement as is reasonably possible, and the Contractor in turn shall be expected to cooperate with institutional personnel in ensuring that security requirements are observed by construction workers.

1.4 OBSERVATION AND INSPECTION

.1 Construction activity and all related movement of personnel & vehicles shall be subject to observation & inspection by institutional staff to ensure that security requirements are met, and understanding of the need for this action is established and maintained throughout.

1.5 PERSONNEL SECURITY

.1 The names of all construction personnel to be employed on the site shall be submitted in writing via SMI form #1279 (Institutional Access / CPIC Clearance Request) which may be obtained from Supervisor Construction security (SCS), Security Intelligence Officer (SIO), Chief, Works & Engineering and/or Public Works Project Manager.

.2 All contractors and their employees, involved in the contract, must report to the Construction Security under the supervision of the Correctional Manager, Operations prior to the first day of employment to submit picture identification and receive a security briefing. This will only be done after a Security Clearance Request form (CPIC) is completed and approved by the Warden. Allow up to 10 working days for Security Clearance Approval.

.3 Warden or designate may require close-up facial photographs to be taken of construction personnel, and may have such photographs displayed at appropriate locations in the institution for identification purposes.

.4 When the contractors and employees are required to work on the prison property, they will enter and exit the premises via routes designated by the Correctional Manager, I/C Institution or Security Construction Supervisor due to job requirements.

.5 All contractors must sign in at designated point of entry before proceeding to work site and sign out again when leaving. The Warden or his designate has the right to refuse permission to enter institutional

property to any person whom he has reason to believe may be a security risk.

1.6 PARKING

.1 The Warden or designate shall assign the parking area or areas to be used by the construction personnel and indiscriminate parking in other locations shall not be permitted.

.2 All unattended vehicles must have windows closed, doors and trunks locked, and keys removed.

.3 Vehicles must not contain any type of weapons, ammunition or spirits (empty, partial or full).

1.7 SHIPPING AND ACCESS TO THE SITE

.1 **Commissioner's Directive 566-2 Control of Vehicle Entry to and Exit from Institution and Institutional Standing Order 566-2.**

.2 Contractor shall verify with the Warden or designate the hours during which vehicles will be allowed to enter or leave the institution. Vehicles or personnel will not be admitted to the facility after normal working hours or on weekends/holidays without prior arrangement with the Warden or designate. Normal construction Work hours are 07:30 to 16:30 hours Monday thru Friday.

.3 Note: Service Entrance is closed between 11:00 to 11:30 each weekday.

.4 Contractor shall have all project material and equipment addressed in his name to avoid confusion with the institution's own shipments.

.5 Contractor shall, when overtime work is necessary, inform the Warden or his designate at least 24 hours in advance so that extra staff may be arranged to maintain the institution's observation inspection of construction activity.

.6 The Warden or his designate may prohibit or restrict access to any part of the institution. He may require that, in certain areas or at certain times, no civilian is allowed unless accompanied by an officer of the Correctional Service Canada (CSC).

.7 Private vehicles will not be allowed within the institution's security wall or fence without special permission of the Warden or his designate. All vehicles entering the institution's security wall or fence must comply with institution's security requirements (i.e. lockable gas caps or wheel covers, no wheel hub caps, lockable doors and windows, tools in a lockable container and locked when not in use).

.8 Trucks delivering materials, equipment and tools to the job will be allowed access when the contents are certified by the Contractor or representative as being strictly necessary for the execution of the work. Security requirements such as wheel covers, lockable fuel caps, lockable doors and windows are still required unless special provisions are made thru the Supervisor, Construction Security. Trucks or vehicles, after being unloaded, are to be parked in the designated area

outside the security wall or fence.

.9 All vehicles are subject to search and will be refused access if, in the opinion of the Warden or his designate, they contain any article that may jeopardize the security of the institution. Examples: weapons, alcohol, cell phones, drugs or narcotics.

1.8 TOOLS AND EQUIPMENT

.1 **Commissioner's Directive 573 Control of Items Critical to the Security" Safety of the Institution under section I0 and Institutional Standing Order 573.**

.2 Contractor shall maintain an inventory of all tools and equipment. A copy of these tool lists shall be kept with the tools, a second copy in the Security Construction Trailer and one must be left with the officer in charge of the service entrance.

.3 Contractor shall keep all tools and equipment under constant supervision and not leave them unattended, paying particular attention to power-driven tools, files, saw blades, rod saw, wire, rope, extension cords and ladders. All used blades and wheels must be accounted for and disposed of in a manner determined by CSC.

.4 Contractor shall store all tools and equipment in places and under conditions approved by the Warden or his designate and must lock all toolboxes when not in use. He shall report immediately all missing or lost tools or equipment to the Warden or his designate and complete “Missing Tool Report” form. This form is available to the General Contractor.

.5 Contractor shall provide permanent identification (engraving) to all tools indicating that they are the personal property of the employee/tradesperson or employing company. Negligence in this regard may result in confiscation of tools.

1.9 TELEPHONES AND INSTALLATIONS

.1 Contractor shall obtain approval from the Warden or his designate for the installation of telephones that shall be located so that they are not accessible to inmates. The Warden or his designate must approve the use of all electronic devices such as cameras, cell phones, tablets, e-readers or laptops. (Electronic Item Registry and Authorization CSC/SCC 1467).

.2 Unless authorized by the Warden, contractors are not to have cell phones in their possession or to use them for any purpose.

1.10 TWO-WAY RADIO COMMUNICATIONS

.1 Warden or designate must approve all two-way radio communication devices.

.2 All radio devices requested for use on job site must be checked with institutional ADGA technicians to ensure no interference with institution equipment.

.3 All radio devices brought into SMI are not to be accessible to inmates.

1.11 ALCOHOL AND NARCOTICS

.1 Stony Mountain Institution has a Zero tolerance for alcohol beverages and narcotics on site. These items are not permitted on institutional property. Discovery of such items on site, and identification of the person or persons responsible for them, shall be reported immediately to the Warden or his designate. Any persons employed in the project that appear to be intoxicated or under the influence of any drug or narcotic, or who behaves in an unusual manner, shall be subject to immediate removal from institutional property.

1.12 CONTROL OF CONTRABAND - GENERAL

.1 Contractor is responsible for ensuring that all persons employed directly or indirectly upon the project are familiar with Correctional and Conditional Release Act section 45 Summary Convictions as follows:

.1 CCRA Summary Conviction Offences 45**.** Every person commits a summary conviction offence who:

(a) is in possession of contraband beyond the visitor control point in a penitentiary;

(b) is in possession of anything referred to in paragraph (b) or (c) of the definition "contraband" in section 2 before the visitor control point at a penitentiary;

(c) delivers contraband to, or receives contraband from, an inmate;

(d) without prior authorization, delivers jewellery to, or receives jewellery from an inmate;

(e) trespasses at a penitentiary.

.2 Search: Where the Warden or his designate suspects, on reasonable grounds, that an employee of the contractor is in possession of contraband, he may order that person to be searched, under, Correctional Conditional Release Regulations Section 42.1 Contraband, Sections 43-46, 54.1-2, 55.1 Search and Seizure and Section 57 Seizure, Commissioner's Directives 566-8 section 9-16.

1.13 KEY CONTROL

.1 Commissioner's Directive 573 Control of Items Critical to the Security" Safety of the Institution under section 3 C & E and Institutional Standing Order 573.

.2 The general contractor shall maintain control of all new keys as follows:

.1 Upon receipt of keys from the security hardware supplier/installer;

.1 Provide a receipt to the security hardware supplier, listing all keys and quantity of each, by key code.

.2 Provide a copy of the receipt to the appropriate Correctional Service Canada representative at the site, Security Maintenance Officer (SMO) Gary

Kowaluk/Clint Mann.

.3 Locks are to be handed over to SMO Officer Gary Kowaluk/Clint Mann ext: 5808/5801 for the purpose of repining of lock to CSC standards. Once locks have been repined, locks will be returned to General Contractor for installation.

.4 Keys for locks will be made available to the Supervisor Security Construction to maintain CSC regulation control.

.3 Upon putting operational keys into use:

.1 Keys will be controlled by the Supervisor, Construction Security at the Construction Security Escort Office (Bldg. C-17) as per CSC standards.

.2 Report, in writing, any untoward circumstances, such as loss, disfigurement, misuse, or mishandling, etc., to the security hardware supplier and CSC/SMO, identifying keys by code and/or number, so that appropriate action may be taken to effect replacement or abandonment of that particular code as circumstances may warrant. Send a copy of these reports to the CSC site representative.

.3 Misuse or improper control of CSC keys can result in that employee being denied access to keys or removal from CSC property.

.4 No inmates are allowed to handle or be given access to CSC keys.

.4 Upon completion of the contract and takeover of the buildings:

.1 Provide a list of all keys, by number and/or key code, with space for the signature of recipients (both Public Works & Government Services Canada representative and CSC representative) and the date of receipt.

.2 Provide certification to Public Works & Government Services Canada that all reasonable caution and care has been exercised in accordance with these instructions, and include a copy for CSC.

.3 Once locks have been installed on new installation, all keys pertaining to that lock and code shall immediately be turned over to the CSC/SMO.

.4 All locks removed during demolition must immediately be turned over to CSC/SMO.

1.14 WORK AREAS

.1 Contractors and their employees shall be confined to their work area. All other buildings and grounds shall be considered "Out of Bounds".

.2 Contractors and their employees shall not contact or attempt to contact or deal in any way with inmates.

.3 Contractors shall sign in at the Construction Security Escort Office (Bldg. C-17) as soon as they have entered the SMI Complex premises and sign out before leaving.

PART 1 - GENERAL

1.1 APPOINTMENT AND PAYMENT

.1 Obtain and pay for services of inspection/testing laboratory for:
- .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
- .2 Inspection and testing performed exclusively for Contractor's convenience.
- .3 Testing, adjustment and balancing of mechanical and electrical equipment and systems.
- .4 Mill tests and certificates of compliance.
- .5 Tests specified to be carried out by Contractor.

.2 Where tests or inspections by designated testing laboratory/agency reveal Work not in accordance with contract requirements, pay costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected work.

1.2 CONTRACTOR'S RESPONSIBILITIES

.1 Provide for Contractor’s and Departmental Representative’s inspection/testing agencies, labour, equipment and facilities to:
- .1 Provide access to Work for inspection and testing.
- .2 Facilitate inspections and tests.

.2 Make good Work disturbed by inspection and test.

.3 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.

.4 Notify Departmental Representative sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.

.5 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.

.6 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Departmental Representative.

1.3 TESTING REQUIREMENTS

.1 Refer to the following Sections for testing requirements.
- .1 Section 02 85 00.03 - Mould Remediation – Maximum Precautions: air clearance testing and other requirements indicated in this Section.
- .2 Section 03 30 00 - Cast-in-Place Concrete: concrete testing.
- .3 Section 04 05 00 – Common Work Results for Masonry: mortar and grout testing.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

1.1 ADMINISTRATIVE

.1 Departmental Representative shall schedule and administer project meetings throughout the progress of the work.

.2 Departmental Representative shall prepare agenda for meetings.

.3 Departmental Representative shall provide written notice of each meeting four days in advance of meeting date.

.4 Departmental Representative shall provide physical space and make arrangements for meetings.

.5 Departmental Representative shall preside at meetings.

.6 Departmental Representative shall record the meeting minutes, including significant proceedings and decisions and shall identify actions by parties.

.7 Departmental Representative shall distribute copies of minutes after meetings and transmit to meeting participants and, affected parties not in attendance and Departmental Representative.

.8 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.2 PRECONSTRUCTION MEETING

.1 Within seven days after award of Contract, Departmental representative shall request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.

.3 Departmental Representative shall establish time and location of meeting and notify parties concerned minimum 5 days before meeting.

.4 Agenda to include:

.1 Appointment of official representative of participants in the Work.

.2 Schedule of Work: in accordance with Section 01 32 16 – Construction Progress Schedule.

.3 Work restrictions, security and institutional requirements in accordance with Section 01 14 00 – Work Restrictions and Section 01 14 10 – Institutional Requirements for Contractors.

.4 Schedule of submission of shop drawings, samples, product data. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.

.5 Requirements for temporary facilities, site sign, offices, storage sheds, utilities and fences in accordance with Section 01 52 00 - Construction Facilities.

.6 Delivery schedule of specified equipment in accordance with Section 01 14 00 – Work Restrictions.

.7 Site security in accordance with Section 01 56 00 - Temporary

Barriers and Enclosures.
.8 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
.9 Departmental Representative provided products.
.10 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
.11 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
.12 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
.13 Monthly progress claims, administrative procedures, photographs, hold backs.
.14 Appointment of inspection and testing agencies or firms.
.15 Insurances, transcript of policies.

1.3 PROGRESS MEETINGS

.1 During course of Work, progress meetings shall be held approximately every two weeks.

.2 Contractor, major Subcontractors involved in Work and Departmental Representative are to be in attendance.

.3 Notify parties minimum five days prior to meetings.

.4 Departmental Representative shall record minutes of meetings and circulate to attending parties and affected parties not in attendance.

.5 Agenda to include the following:
.1 Review, approval of minutes of previous meeting.
.2 Review of Work progress since previous meeting.
.3 Field observations, problems, conflicts.
.4 Problems which impede construction schedule.
.5 Review of off-site fabrication delivery schedules.
.6 Corrective measures and procedures to regain projected schedule.
.7 Revision to construction schedule.
.8 Progress schedule, during succeeding work period.
.9 Review submittal schedules: expedite as required.
.10 Maintenance of quality standards.
.11 Review proposed changes for effect on construction schedule and on completion date.
.12 Health and Safety.
.13 Other business.

1.1 GENERAL

.1 Use a project management control system based Bar (GANTT) Chart technique.

.2 Schedule reviews by Departmental Representative shall not mean approval of detail inherent in schedule, responsibility for which lies with Contractor.

.3 Accept sole responsibility for coordinating, scheduling of work, and the sequencing of work components and tasks.

1.2 DEFINITIONS

.1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.

.2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.

.3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.

.4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.

.5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.

.6 Master Plan: summary-level schedule that identifies major activities and key milestones.

.7 Milestone: significant event in project, usually completion of major deliverables.

.8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.

.9 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.

1.3 REQUIREMENTS

.1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration. Incorporate phasing requirements.

.2 Plan to complete Work in accordance with prescribed milestones and

time frame.

.3 Limit activity durations to maximum of approximately ten (10) working days, to allow for progress reporting.

.4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit to Departmental Representative within fourteen (14) working days of Award of Contract Bar (GANTT) Chart Schedule for planning, monitoring and reporting of project progress.

.3 Submit Project Schedule to departmental Representative within five (5) working days of receipt of Master Plan.

1.5 PROJECT MILESTONES

.1 Project milestones form interim targets for Project Schedule. Include:
- .1 Initial Detailed Inspection.
- .2 Submittals: Shop Drawings, Product Data, Samples.
- .3 Site Mobilization.
- .4 Hoarding.
- .5 Demolition.
- .6 Work (indicate phases)
- .7 Commissioning (indicate phases).
- .8 Interim Certificate (Substantial Completion) date.
- .9 Final Certificate Completion.

1.6 MASTER PLAN

.1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).

.2 Departmental representative will review and return revised schedules within five (5) working days.

.3 Revise impractical schedule and resubmit within five (5) working days.

.4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.7 PROJECT SCHEDULE

.1 Develop detailed Project Schedule derived from Master Plan.

.2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
- .1 Initial Detailed Inspection.
- .2 Submittals: Shop Drawings, Product Data, Samples.
- .3 Permits.
- .4 Site Mobilization.

.5 Hoarding.
.6 Demolition.
.7 Phased Interior Work (Walk-in Freezers, Cooler Room , walls, ceiling).
.8 Power.
.9 Lighting.
.10 Plumbing.
.11 HVAC.
.12 Fire Systems.
.13 Testing and Commissioning (phased).
.14 Interim Certificate (Substantial Completion) date.
.15 Final Certificate Completion.

.3 Relate Detail Schedule activities to basic activities and milestones developed and approved in Master Plan.

.4 Insert Change Orders in appropriate and logical location of Detail Schedule. After analysis, clearly state and report to Departmental Representative for review effects created by insertion of new Change Order.

1.8 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.

.2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.9 PROJECT MEETINGS

.1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

.2 Weather-related delays with their remedial measures will be discussed and negotiated.

1.10 QUALITY ASSURANCE

.1 Use experienced personnel, fully qualified in planning and scheduling to provide services from start of construction to Final Certificate, including Commissioning.

1.11 PROJECT MEETING

.1 Meet with Departmental Representative within five (5) working days of Award of Contract, to establish Work requirements and approach to project construction operations.

1.1 ADMINISTRATIVE

.1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 The Contractor is responsible for delays incurred due to rejected Submissions, which have not met Contract requirements.

.3 Do not proceed with Work affected by submittal until review is complete.

.4 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.5 Where items or information is not produced in SI Metric units converted values are acceptable.

.6 Contractor is responsible for crossing out all information on standard/general product data that does not apply.

.7 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.8 Notify Departmental Representative in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.9 Verify field measurements and affected adjacent Work are coordinated.

.10 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.

.11 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.

.12 Keep one reviewed copy of each submission on site.

.13 Unless otherwise stated, ensure four (4) reviewed copies of all submissions are available to be retained by the Departmental Representative.

1.2 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Submit shop drawings bearing stamp and signature of qualified professional registered or licensed in Province or Territory of project

location in Canada.

.1 Submit (in addition to specified number of hard copies) in electronic PDF version.

.3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.4 Allow ten (10) days for Departmental Representative's review of each submission.

.5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.

.7 Accompany submissions with transmittal letter, containing:

.1 Date.

.2 Project title and number.

.3 Contractor's name and address.

.4 Identification and quantity of each shop drawing, product data and sample.

.5 Other pertinent data.

.8 Submissions to include:

.1 Date and revision dates.

.2 Project title and project number.

.3 Name and address of:

.1 Contractor.

.2 Supplier.

.3 Manufacturer.

.4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.

.5 Details of appropriate portions of Work as applicable:

.1 Fabrication.

.2 Layout, showing dimensions, including identified field dimensions, and clearances.

.3 Setting or erection details.

.4 Capacities.

.5 Performance characteristics.

.6 Standards.

.7 Operating weight.

.8 Relationship to adjacent work.

.9 After Departmental Representative's review, distribute copies.

.10 Submit electronic PDF copies of shop drawings for each requirement

requested in specification Sections and as requested by Departmental Representative.

.11 Submit electronic PDF copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.

.12 Submit electronic PDF copies of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accordance with specified requirements.

.13 Submit electronic PDF copies of certificates for requirements requested in specification Sections and as requested by Departmental Representative.
.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
.2 Certificates must be dated after award of project contract complete with project name.

.14 Submit electronic PDF copies of manufacturer’s instructions for requirements requested in specification Sections and as requested by Departmental Representative.
.1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.

.15 Submit electronic PDF copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
.1 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.16 Submit electronic PDF copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.

.17 Delete information not applicable to project.

.18 Supplement standard information to provide details applicable to project.

.19 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.20 The review of shop drawings by Public Works and Government Services Canada (PWGSC) is for sole purpose of ascertaining conformance with general concept.

.1 This review shall not mean that PWGSC approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.

.2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.3 SAMPLES

.1 Submit for review samples as requested in respective specification Sections. Label samples with origin and intended use.

.2 Deliver samples prepaid to address as directed by Departmental Representative.

.3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.

.4 Where colour, pattern or texture is criterion, submit full range of samples.

.5 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.6 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.

.7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.4 MOCK-UPS

.1 Erect mock-ups in accordance with Section 01 45 00 – Quality Control.

1.5 PHOTOGRAPHIC DOCUMENTATION

.1 Submit labeled progress photographs.

.2 Each submission:

.1 Prints sizes from electronic format, 200 x 300 mm.

.2 Electronic format on CD.

.3 Print Type: semi-matt colour with binding margin at one end.

.4 Paper: single weight, not mounted.

.5 Number of prints required: 3 sets.

.6 Identification, print copy and electronic format: name and project number, viewpoint and date of photograph.

.7 Viewpoints: viewpoints determined by Departmental Representative.

.8 Frequency: bi-weekly and with each progress statement.

1.1 REFERENCES

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations

.2 Province of Manitoba
.1 The Workers Compensation Act RSM 1987 - Updated 2017.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit site-specific Health and Safety Plan: Within seven (7) days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
.1 Results of site specific safety hazard assessment.
.2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.

.3 Submit two (2) copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative.

.4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.

.5 Submit copies of incident and accident reports.

.6 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Sustainable Requirements: Construction and Hazardous Materials.

.7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within three (3) days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within two (2) days after receipt of comments from Departmental Representative.

.8 Departmental Representative's review of Contractor's final Health and Safety Plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

.9 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.

.10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.3 SAFETY ASSESSMENT

.1 Perform site specific safety hazard assessment related to project.

1.4 MEETINGS

.1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

1.5 REGULATORY REQUIREMENTS

.1 Do Work in accordance with Section 01 41 00 - Regulatory Requirements.

1.6 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

.2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.7 RESPONSIBILITY

.1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.8 COMPLIANCE REQUIREMENTS

.1 Comply with most recent updates of: The Workers Compensation Act and The Workplace Safety and Health Act.

.2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.9 UNFORSEEN HAZARDS

.1 When unforeseen or peculiar safety-related factor, hazard, or condition occurs during performance of Work, advise Health and Safety Coordinator and or Safety Officer and follow procedures in accordance with Acts and Regulations of Province having jurisdiction and advise Departmental Representative verbally and in writing.

1.10 HEALTH AND SAFETY CO-ORDINATOR

.1 Employ and assign to Work, competent and authorized representative as Health and Safety Coordinator. Health and Safety Coordinator must:

.1 Have working knowledge of occupational safety and health

regulations.

.2 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.

.3 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.

1.11 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Departmental Representative.

1.12 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.

.2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.

.3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.13 BLASTING

.1 Blasting or other similar work is not permitted.

1.14 POWDER ACTUATED DEVICES

.1 Use of powder actuated devices is not permissible.

1.15 WORK STOPPAGE

.1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

PART 1 - GENERAL

1.1 DEFINITIONS

.1 Definitions:

.1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.

.2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water and air; biological and cultural resources; and includes management of visual aesthetics; noise: solid, chemical, gaseous and liquid waste; radiant energy and radioactive material as well as pollutants.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets as indicated in various Sections and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit two copies of WHMIS MSDS in accordance with Section 01 33 00 - Submittal Procedures and Section 01 35 29.06 - Health and Safety Requirements.

.3 Submit the following Correctional Services Canada forms which are to be provided at start of construction:

.1 Refrigeration System or Air-Conditioning System Service Log.

.2 Leak Test Notice for Refrigeration and Air-Conditioning System.

.3 Prior to commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative.

.4 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues which are to be addressed during construction.

.5 Address topics at level of detail commensurate with environmental issue and required construction task.

.6 Include in Environmental Protection Plan:

.1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.

.2 Name and qualifications of person responsible for manifesting hazardous waste to be removed from site.

.3 Name and qualifications of person responsible for training site

personnel.
.4 Descriptions of environmental protection personnel training program.
.5 Spill Control Plan: including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
.6 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
.7 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.
.8 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
.9 Waste water management plan that identifies methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.

1.3 FIRES

.1 Fires and burning of rubbish are not permitted.

1.4 DISPOSAL OF WASTE

.1 Do not bury rubbish or waste materials on site.

.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

1.5 POLLUTION CONTROL

.1 Control emissions from equipment and plant to local authorities' emission requirements.

.2 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area, by providing temporary enclosures.

.3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris.

1.6 NOTIFICATION

.1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection Plan.

.2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
.1 Take action only after receipt of written approval by Departmental Representative.

.3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.

.4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 CLEANING .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
.1 Leave Work area clean at end of each day.

.2 Ensure sanitary sewers remain free of waste and volatile materials disposal.

.3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.4 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

1.1 REFERENCES AND CODES

.1 Perform Work in accordance with National Building Code of Canada (NBC) including amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Meet or exceed requirements of:
.1 Contract documents.
.2 Specified standards, codes and referenced documents.

1.2 HAZARDOUS MATERIAL DISCOVERY

.1 Asbestos: demolition of spray or trowel-applied asbestos is hazardous to health. Stop work immediately when material resembling spray or trowel-applied asbestos is encountered during demolition work. Notify Departmental Representative.

.2 PCB: Polychlorinated Biphenyl: stop work immediately when material resembling Polychlorinated Biphenyl is encountered during demolition work. Notify Departmental Representative.

.3 Mould: stop work immediately when material resembling mould is encountered during demolition work. Notify Departmental Representative.
.1 Refer to indications on drawings and Section 02 85 00.03 – Mould Abatement – Maximum Precautions.

1.3 BUILDING SMOKING ENVIRONMENT

.1 Comply with smoking restrictions and municipal by-laws.

1.1 INSPECTION

.1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative, or law of Place of Work.

.3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.4 Departmental Representative will review the work in progress and completed work. Contractor to coordinate such site visits with Departmental Representative.

.5 Contractor to pre-inspect all completed work prior to requesting Departmental representative inspections.

.6 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

1.2 ACCESS TO WORK

.1 Allow inspection/testing personnel access to Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.3 PROCEDURES

.1 Notify appropriate agency and Departmental Representative in advance of requirement for tests/inspections, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

1.4 REJECTED WORK

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Work damaged by such removals or replacements promptly.

.3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference

in value between Work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative.

1.5 REPORTS

.1 Submit copies of inspection and test reports to Departmental Representative.

.2 Provide copies of reports to subcontractor of work being inspected or tested and manufacturer or fabricator of material being inspected or tested.

1.6 MOCK-UPS

.1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of Sections required to provide mock-ups.

.2 Construct in locations directed by Departmental Representative.

.3 Prepare mock-ups for Departmental Representative review with reasonable promptness and in orderly sequence, to not cause delays in Work.

.4 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.5 Mock-ups may remain as part of Work.

1.7 EQUIPMENT AND SYSTEMS

.1 Submit adjustment and balancing reports for mechanical, electrical and building equipment systems.

.2 Refer to related Sections for definitive requirements.

PART 1 - GENERAL

1.1 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.2 INSTALLATION AND REMOVAL

.1 Provide temporary utilities controls in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.3 WATER SUPPLY

.1 Departmental Representative will provide supply of potable water for construction use.

1.4 TEMPORARY HEATING AND VENTILATION

.1 Ventilating:
.1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
.2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
.3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
.4 Ventilate storage spaces containing hazardous or volatile materials.
.5 Ventilate temporary sanitary facilities.
.6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

.2 Maintain strict supervision of operation of temporary ventilating equipment to:
.1 Conform to applicable codes and standards.
.2 Enforce safe practices.
.3 Prevent abuse of services.
.4 Prevent damage to finishes.

.3 Be responsible for damage to Work due to failure in providing adequate protection during construction.

1.5 TEMPORARY POWER AND LIGHT

.1 Departmental Representative will pay for temporary power during construction for temporary lighting and operating of power tools.

.2 Arrange for connection. Pay costs for installation, maintenance and removal.

.3 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors is not less than 162 lx.

1.6 TEMPORARY COMMUNICATION FACILITIES

.1 Comply with requirements of Section 01 14 10 – Institutional Requirements for Contractors.

1.7 FIRE PROTECTION

.1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and bylaws.

.2 Burning rubbish and construction waste materials is not permitted on site.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

.1 Provide lockable Construction Office Trailer. Place on site at location designated by the Departmental Representative.

.2 Comply with requirements in Section 01 14 10 - Institutional requirements for Contractors.

1.2 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.

1.3 INSTALLATION AND REMOVAL

.1 Prepare site plan indicating proposed location and dimensions of area to be used by Contractor number of trailers to be used.

.2 Indicate use of supplemental or other staging area.

.3 Provide construction facilities in order to execute work expeditiously.

.4 Remove from site all such work after use.

1.4 LADDERS

.1 Provide and maintain ladders.

1.5 SCAFFOLDING

.1 Scaffolding in accordance with CAN/CSA-S269.2.

.2 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms and temporary stairs.

1.6 HOISTING

.1 Provide, operate and maintain hoists and cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.

.2 Hoists cranes to be operated by qualified operator.

1.7 SITE STORAGE/LOADING

.1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

.2 Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.8 CONSTRUCTION PARKING

.1 Parking is limited and restricted to designated Laydown Area and areas designated by Departmental Representative.

.2 Make good damage to roads used for project site access.

.3 Provide and maintain adequate access to project site.

.4 Clean site access areas/routes where used by Contractor's equipment.

1.9 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.10 SANITARY FACILITIES

.1 Provide lockable sanitary facilities for work force in accordance with governing regulations and ordinances.

.2 Post notices and take precautions as required by local health authorities.

.3 Maintain facilities in clean, sanitary condition.

1.11 CONSTRUCTION SIGNAGE

.1 No construction signs or advertisements, other than health and safety, warning and instructional signs, are permitted on site.

.2 Maintain approved signs and notices in good condition for duration of project, and dispose of off-site on completion of project or earlier if directed by Departmental Representative.

1.12 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.

.2 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs.

.3 Protect traveling public from damage to person and property.

.4 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.

.5 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.

.6 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.

.7 Dust control: adequate to ensure safe operation at all times.

.8 Provide snow removal during period of Work at project site.

1.13 CLEAN-UP

.1 Remove construction debris, waste materials, packaging material from work site daily.

.2 Clean dirt or mud tracked onto paved or surfaced roadways.

.3 Store materials resulting from demolition activities that are salvageable.

.4 Stack stored new or salvaged material not in construction facilities.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

1.1 INSTALLATION AND REMOVAL

.1 Provide temporary measures in order to execute Work expeditiously and prevent damage to the work and to the Building.

.2 Remove from site all such work after use.

1.2 DUST TIGHT SCREENS

.1 Provide dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.

.2 Maintain and relocate protection until such work is complete.

1.3 SECURITY

.1 Provide temporary barriers / enclosures as required to meet institutional security requirements.

1.4 ACCESS TO SITE

.1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

1.5 PUBLIC TRAFFIC FLOW

.1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public.

1.6 FIRE ROUTES

.1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.7 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

.1 Protect surrounding private and public property from damage during performance of Work.

.2 Be responsible for damage incurred.

1.8 PROTECTION OF BUILDING FINISHES

.1 Provide protection for existing, finished and partially finished building finishes and equipment during performance of Work.

.2 Provide necessary screens, covers, and hoardings.

.3 Confirm with Departmental Representative locations and installation schedule three (3) days prior to installation.

.4 Be responsible for damage incurred due to lack of or improper protection.

1.9 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

PART 1 - GENERAL

1.1 QUALITY

.1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition.

.3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.4 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.

.5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

.6 Reference shop drawings and engineering design, securely fasten materials and building components in place to resist high winds in Stony Mountain geographical area.

1.2 AVAILABILITY

.1 Immediately upon signing Contract(s), review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.2 In event of failure to notify Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.3 STORAGE, HANDLING AND PROTECTION

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Store sheet materials on flat, solid supports and keep clear of ground. Slope to shed water.

.5 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.6 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.

.7 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.4 TRANSPORTATION

.1 Pay costs of transportation of products required in performance of Work.

.2 Transportation cost of products supplied by Departmental Representative will be paid for by Departmental Representative. Unload, handle and store such products.

1.5 MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise indicated in specification Section, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.

.2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, to allow for review by Departmental Representative in order to establish course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

1.6 QUALITY OF WORK

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.

.2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.

.3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

1.7 CO-ORDINATION

.1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.8 CONCEALMENT

.1 In finished areas conceal conduit, pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

.2 Before installation inform Departmental Representative if there is interference. Install as directed by Departmental Representative.

1.9 REMEDIAL WORK

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.

.2 Perform remedial work by specialists familiar with materials affected. Perform remedial work in a manner to neither damage nor put at risk any portion of Work.

1.10 LOCATION OF FIXTURES

.1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.

.2 Inform Departmental Representative of conflicting installation. Install as directed.

1.11 FASTENINGS

.1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.

.2 Prevent electrolytic action between dissimilar metals and materials.

.3 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.

.4 Keep exposed fastenings to a minimum, space evenly and install neatly.

.5 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.12 FASTENINGS - EQUIPMENT

.1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

.2 Ensure components and fasteners are compatible. Do not utilize components that will create galvanic action between components.

.3 Bolts may not project more than one diameter beyond nuts.

.4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.13 PROTECTION OF WORK IN PROGRESS

.1 Prevent overloading of parts of building. Do not cut, drill or sleeve load bearing structural member, unless specifically indicated without written approval of Departmental Representative.

1.14 EXISTING UTILITIES

.1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and/or building occupants and pedestrian and vehicular traffic.

.2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

PART 1 - GENERAL

1.1 CUTTING AND REMEDIAL WORK - GENERAL

.1 Comply with the following requirements:
- .1 Prior to cutting or drilling concrete ceilings, walls and/or floors, proposed location must be scanned for reinforcing steel, conduits or other obstructions.
  - .1 Scans must be submitted as per “Submittals” noted below and approval to proceed must be granted by the Departmental Representative before any cutting or drilling takes place.
  - .2 Inform Departmental Representative if reinforcing steel, conduits or other obstructions are detected within cutting area.
- .2 No reinforcing steel shall be cut unless authorized by Departmental Representative.
- .3 Report immediately any accidental cutting of reinforcing steel to the Departmental Representative for instruction on remedial measures.
- .4 Protect existing work from damage.
- .5 Make good all damage to existing construction.
- .6 Use diamond drill through concrete and masonry.

1.2 SUBMITTALS

.1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit written request accompanied by scans of location for any proposed cutting or drilling through concrete ceilings, walls and/or floors.
- .1 Proposed location must be scanned for reinforcing steel, conduits or other obstructions.

.3 Submit written request in advance of cutting or alteration which affects:
- .1 Structural integrity of elements of project.
- .2 Integrity of weather-exposed or moisture-resistant elements.
- .3 Efficiency, maintenance, or safety of operational elements.
- .4 Visual qualities of sight-exposed elements.

.4 Include in request:
- .1 Identification of project.
- .2 Location and description of affected Work.
- .3 Scans.
- .4 Statement on necessity for cutting or alteration.
- .5 Description of proposed Work, and products to be used.
- .6 Alternatives to cutting and patching.
- .7 Effect on Work of Owner or separate contractor.
- .8 Proposed date and time work will be executed.

.5 Obtain approval in writing prior to proceeding.

1.3 MATERIALS

.1 Required for original installation.

.2 Match existing style and color and finishes for flashings and trim work where practical.

.3 Change in Materials: Submit request for substitution in accordance with Section 01 33 00 – Submittal Procedures.

1.4 PREPARATION

.1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.

.2 After uncovering, inspect conditions affecting performance of Work.

.3 Beginning of cutting or patching means acceptance of existing conditions.

.4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage. Provide protection from elements for areas which are to be exposed by uncovering work.

1.5 EXECUTION

.1 Execute cutting, fitting, and patching to complete Work.

.2 Fit several parts together, to integrate with other Work.

.3 Uncover Work to install ill-timed Work.

.4 Remove and replace defective and non-conforming Work.

.5 Remove samples of installed Work for testing.

.6 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.

.7 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

.8 Employ where applicable, original installer to perform cutting and patching for weather-exposed and moisture-resistant elements and sight-exposed surfaces.

.9 Cut rigid materials using Masonry saw or core drill. Pneumatic or impact tools are not allowed on masonry work without prior approval.

.10 Restore work with new products in accordance with requirements of Contract Documents.

.11 Seal and fit Work weather tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

.12 At penetrations of fire-rated wall, ceiling or floor construction, voids are to be sealed only by firestopping sub-contractor with materials and methods as required to maintain fire rating in accordance with Section

07840 - Firestopping.

.13 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

1.7 EXCESS MATERIAL

.1 Remove all excess other material to off-site.

PART 2- PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3- EXECUTION

3.1 NOT USED

.1 Not Used.

PART 1 - GENERAL

1.1 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris.

.2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.

.3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.4 Provide lockable on-site containers for collection of waste materials and debris. Locate as directed by Departmental Representative.

.5 Provide and use marked separate lockable bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal. Locate as directed by Departmental Representative.

.6 Dispose of waste materials and debris off site.

.7 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.

.8 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

.9 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

.10 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

.11 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.2 FINAL CLEANING

.1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

.3 Prior to final review remove surplus products, tools, construction machinery and equipment.

.4 Remove waste products and debris.

.5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn

waste materials on site.

.6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.7 Clean and polish glass, hardware, stainless steel, chrome, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.

.8 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, walls, floors and ceilings.

.9 Clean lighting reflectors, lenses, and other lighting surfaces.

.10 Vacuum clean and dust building interiors, behind grilles, louvres and screens.

.11 Prepare floor finishes, as recommended by manufacturer.

.12 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

PART 1 – GENERAL

1.1 WASTE MANAGEMENT GOALS

.1 Prior to start of Work conduct meeting with Departmental Representative to review and discuss PWGSC's waste management goals.

.2 PWGSC's waste management goal 75 percent of total project waste to be diverted from landfill sites. Provide Departmental Representative documentation certifying that waste management, recycling, reuse of recyclable and reusable materials have been extensively practiced.

.3 Accomplish maximum control of solid construction waste.

.4 Preserve environment and prevent pollution and environment damage.

1.2 DEFINITIONS

.1 Demolition Waste Audit (DWA): relates to actual waste generated from project.

.2 Inert Fill: inert waste - exclusively asphalt and concrete.

.3 Materials Source Separation Program (MSSP): consists of series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.

.4 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.

.5 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.

.6 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

.7 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
.1 Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
.2 Returning reusable items including pallets or unused products to vendors.

.8 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.

.9 Separate Condition: refers to waste sorted into individual types.

.10 Source Separation: acts of keeping different types of waste materials

separate beginning from first time they became waste.

.11 Waste Management Co-ordinator (WMC): Contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.

.12 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials.

1.3 DOCUMENTS

.1 Maintain at job site, one copy of following documents:
.1 Demolition Waste Audit.
.2 Waste Reduction Workplan.
.3 Material Source Separation Plan.
.4 Schedules completed for project.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submittals in accordance with Section 01 33 00.

.2 Prepare and submit following prior to project start-up:
.1 Submit 2 copies of completed Waste Reduction Workplan (WRW): Schedule B.
.2 Submit 2 copies of completed Demolition Waste Audit (DWA): Schedule C.

.3 Submit before final payment summary of waste materials salvaged for reuse, recycling or disposal by project using deconstruction/disassembly material audit form.
.1 Failure to submit could result in hold back of final payment.
.2 Provide receipts, scale tickets, waybills, and show quantities and types of materials reused, recycled or disposed of.
.3 For each material reused, sold or recycled from project, include amount in tones or quantities by number, type and size of items and the destination.
.4 For each material land filled or incinerated from project, include amount of material and identity of landfill, incinerator or transfer station.

1.5 WASTE REDUCTION WORKPLAN (WRW)

.1 Prepare WRW prior to project start-up.

.2 WRW should include but not limited to:
.1 Destination of materials listed.
.2 Deconstruction/disassembly techniques and sequencing.
.3 Schedule for deconstruction/disassembly.
.4 Location.
.5 Security.
.6 Protection.
.7 Clear labeling of storage areas.
.8 Details on materials handling and removal procedures.
.9 Quantities for materials to be salvaged for reuse or recycled and materials sent to landfill.

.3 Structure WRW to prioritize actions and follow 3R's hierarchy, with Reduction as first priority, followed by Reuse, then Recycle.

.4 Describe management of waste.

.5 Identify opportunities for reduction, reuse, and recycling of materials.

.6 Post WRW or summary where workers at site are able to review content.

.7 Set realistic goals for waste reduction, recognize existing barriers and develop strategies to overcome these barriers.

.8 Monitor and report on waste reduction by documenting total volume and cost of actual waste removed from project.

1.6 DEMOLITION WASTE AUDIT (DWA)

.1 Prepare DWA prior to project start-up.

.2 Complete DWA: Schedule A.

.3 Provide inventory of quantities of materials to be salvaged for reuse, recycling, or disposal.

1.7 MATERIALS SOURCE SEPARATION PROGRAM (MSSP)

.1 Prepare MSSP and have ready for use prior to project start-up.

.2 Implement MSSP for waste generated on project in compliance with approved methods and as reviewed by Departmental Representative.

.3 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.

.4 Provide containers to deposit reusable and recyclable materials.

.5 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.

.6 Locate separated materials in areas which minimize material damage.

.7 Collect, handle, store on-site, and transport off-site, salvaged materials in separate condition.
.1 Transport to approved and authorized recycling facility or to users of material for recycling.

1.8 WASTE PROCESSING SITES

.1 Use Provincial Ministry Office recognized and listed processing sites pertaining to reuse and recycle centres and waste processing sites.

1.9 STORAGE HANDLING AND PROTECTION

.1 Store, materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.

.2 Unless specified otherwise, materials for removal become Contractor's property.

.3 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.

.4 Protect structural components not removed for demolition from

movement or damage.

.5 Support affected structures. If safety of building is endangered, cease operations and immediately notify Departmental Representative.

.6 Protect surface drainage, mechanical and electrical from damage and blockage.

.7 Separate and store materials produced during dismantling of structures in designated areas.

.8 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.
.1 On-site source separation is recommended.
.2 Remove co-mingled materials to off-site processing facility for separation.
.3 Provide waybills for separated materials.

1.10 DISPOSAL OF WASTES

.1 Do not bury rubbish or waste materials.

.2 Do not dispose of waste, volatile materials, mineral spirits, oil, paint thinner into waterways, storm, or sanitary sewers.

.3 Keep records of construction waste including:
.1 Number and size of bins.
.2 Waste type of each bin.
.3 Total tonnage generated.
.4 Tonnage reused or recycled.
.5 Reused or recycled waste destination.

.4 Remove materials from deconstruction as deconstruction/disassembly Work progresses.

.5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in pre-demolition material audit.

1.11 USE OF SITE AND FACILITIES

.1 Execute Work with least possible interference or disturbance to normal use of premises.

1.12 SCHEDULING

.1 Co-ordinate Work with other activities at site to ensure timely and orderly progress of Work.

1.13 APPLICATION

.1 Do Work in compliance with WRW.

.2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

1.14 CLEANING

.1 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.

.2 Clean-up Work area as work progresses.

.3 Source separate materials to be reused/recycled into specified sort areas.

1.15 DEMOLITION WASTE AUDIT (DWA)

.1 Schedule C - Demolition Waste Audit (DWA):

(1) Material Description	(2) Quantity	(3) Unit	(4) Total	(5) Volume (cum)	(6) Weight (cum)	(7) Remarks
Concrete Block	75%					
Copper Piping	100%					

END OF SECTION

PART 1 - GENERAL

1.1 ADMINISTRATIVE REQUIREMENTS

.1 Acceptance of Work Procedures:
.1 Contractor's Inspection: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
.1 Notify Departmental Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
.2 Request Departmental Representative inspection.
.2 Departmental Representative Inspection:
.1 Departmental Representative and Contractor to inspect Work and identify defects and deficiencies.
.2 Contractor to correct Work as directed.
.3 Completion Tasks: submit written certificates in English that tasks have been performed as follows:
.1 Work: completed and inspected for compliance with Contract Documents.
.2 Defects: corrected and deficiencies completed.
.3 Work: complete and ready for final inspection.
.4 Final Inspection:
.1 When completion tasks are done, request final inspection of Work by Departmental Representative and Contractor.
.2 When Work incomplete according to Departmental Representative, complete outstanding items and request re-inspection.

1.2 FINAL CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.
.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

.2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1- GENERAL

1.1 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Provide Operation and matenance Data, Spare Parts, Manitenance Materials and Special Tools as indicated in specification Sections. Review all Sections for requirements.

.3 Prepare instructions and data using personnel experienced in maintenance and operation of described products.

.4 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or non-defective, and of same quality and manufacture as products provided in Work.

.5 Furnish evidence, if requested, for type, source and quality of products provided.

.6 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

.7 Pay costs of transport.

.8 Schedule for Close-out Submittals:

.1 Two (2) weeks prior to Substantial Performance of the Work, submit to the Departmental Representative for review:

.1 One draft digital complete copy of complete Operation and Maintenance Manual.

.2 One draft digital copy of As-built Record Drawing maintained and updated throughout construction.

.3 One draft digital copy of Inventory List for Spare Parts, Maintenance Materials and Special Tools.

.4 One draft digital copy of Warranty Index listing all warranty items and durations.

.2 Submission will be returned with comments by Departmental Representative(s). Revise as required prior to Final Submittal.

.3 Final Submission:

.1 Operation and Maintenance Manual:

.1 Manual to include:

.1 Inventory List for Spare Parts, Maintenance Materials and Special Tools.

.2 Warranty Index and Warranties.

.2 Quantity: four(4) hard copies and one (1) digital copy

.2 As-built Record Drawings (digital and hard copy).

.1 Quantity: one (1) hard copy and one (1) digital copy

.3 Deliver to site and locate as directed:

.1 Spare Parts

.2 Maintenance Materials

.3 Special Tools.

1.2 ELECTRONIC SUBMITTALS

.1 Submit number of hard copies specified for each type and format of submittal.

.2 Also submit in electronic format as PDF files and in MS Word, Excel, Project as may be appropriate and in Autocad DWG files, all on CD R/W or USB.

1.3 FORMAT: OPERATION AND MAINTENANCE MANUALS

.1 Operation and Maintenance Manuals:

.1 Hard copy submission:

.1 Organize data as instructional manual.

.2 Binders:

.1 Vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with clear vinyl spine and face pockets.

.2 When multiple binders are used correlate data into related consistent groupings. Identify contents of each binder on spine.

.3 Cover:

.1 Identify each binder with face and spine pocket inserts, type or printed title 'Project Record Documents, Operation and Maintenance Manual'; list title of project, building number, project number, prepared by (Contractor's name), date.

.4 Arrangement:

.1 Organize files into current Masterformat numbering system.

.2 Arrange content by components, systems, integrated systems, process flow, under Section numbers and sequence of Table of Contents.

.5 Tabs:

.1 Provide tabbed typewritten fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.6 Text:

.1 Manufacturer's printed data, or typewritten data.

.7 Drawings:

.1 Provide with reinforced punched binder tab.

.2 Bind in with text; fold larger drawings to size of text pages.

.2 Digital submission:

.1 Match description for hard copy noted above.

.2 Provide drawings in PDF and DWG format.

.3 Organize manuals into industry standard maintenance manual tabs with links in index to each descriptive section describing the component or maintenance procedure.

.4 Organize contents into applicable sections of work to parallel specification break-down. Mark each section by labeled tabs (navigation buttons).

.5 Label disk "Operational and Maintenance Data", project name, project number, date, name(s) of Contractor.

.6 Include scanned guarantees, bonds, diagrams and drawings.

.7 Ensure all content is legible.

1.4 CONTENTS: OPERATION AND MAINTENANCE MANUALS

.1 Table of Contents for Each Volume: provide title of project;
.1 Date of submission; names.
.2 Addresses and telephone numbers of Departmental Representatives and Contractor with name of responsible parties.
.3 Schedule of products and systems, indexed to content of volume.

.2 Provide operation and maintenance manual data as indicated in individual Specification Sections. Review all Sections for requirements.

.3 For each product or system:
.1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.4 Product Data:
.1 Mark each sheet to identify specific products and component parts, and data applicable to installation.
.1 Delete all inapplicable information.
.2 Supplement product data with drawings where applicable to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
.3 Provide typewritten text as required to supplement product data.
.1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

.5 Equipment and Systems:
.1 For each item of equipment and each system include description of unit or system, and component parts.
.1 Give function, normal operation characteristics and limiting conditions.
.2 Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
.2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
.3 Include installed colour coded wiring diagrams.
.4 Operating Procedures:
.1 Include start-up, break-in, and routine normal operating instructions and sequences.
.1 Include if applicable, regulation, control, stopping, shut-down, and emergency instructions.
.2 Include if applicable, summer, winter, and any special operating instructions.
.5 Maintenance Requirements:
.1 Include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions and alignment, adjusting, balancing, and checking instructions.
.2 Provide servicing and lubrication schedule, and list of lubricants required.

.6 Include manufacturer's printed operation and maintenance instructions.
.7 Include sequence of operation by controls manufacturer.
.8 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
.9 Provide installed control diagrams by controls manufacturer.
.10 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
.11 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
.12 Include test and balancing reports as specified.
.13 Additional requirements: as specified in individual specification sections.

.6 Materials and Finishes:
.1 Building products, applied materials, and finishes: include product data, with catalogue number, size, composition, and colour and texture designations.
.1 Provide information for re-ordering custom manufactured products.
.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
.3 Moisture-protection and weather-exposed products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
.1 Additional requirements: as specified in individual specifications sections.

.7 Warranties:
.1 Include a Warranty tab with index cross-referencing all warranties.

1.5 AS -BUILT SPECIFICATIONS AND SAMPLES

.1 Maintain, in addition to requirements in General Conditions, at site for Departmental Representative, one record copy of:
.1 Contract Drawings.
.2 Specifications.
.3 Addenda.
.4 Change Orders and other modifications to Contract.
.5 Reviewed shop drawings, product data, and samples.
.6 Field test records.
.7 Inspection certificates.
.8 Manufacturer's certificates.

.2 Store record documents and samples in field office apart from documents used for construction.
.1 Provide files, racks, and secure storage.

.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
.1 Label each document "PROJECT RECORD" in neat, large, printed letters.

.4 Maintain record documents in clean, dry and legible condition.
.1 Do not use record documents for construction purposes.

.5 Keep record documents and samples available for inspection by Departmental Representative.

.6 Departmental Representative may furnish additional drawings and specifications to clarify Work.
.1 Such documents become part of Contract Document.
.2 Include such documents in As Built submission.

.7 Turn over at completion, with all as-built information.

.8 Submit to Departmental Representative one copy of drawings and specifications for review prior to final submission.

1.6 RECORDING ACTUAL SITE CONDITIONS

.1 Record information as work progresses, on set of black line opaque drawings, and in copy of Specifications Documents.

.2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.

.3 Record information concurrently with construction progress.
.1 Do not conceal Work until required information is recorded.

.4 Contract Drawings and Shop Drawings: mark each item to record actual construction, including, where applicable:
.1 Measured depths of elements of foundation in relation to finish first floor datum.
.2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
.3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
.4 Field changes of dimension and detail.
.5 Changes made by change orders.
.6 Details not on original Contract Drawings.
.7 References to related shop drawings and modifications.

.5 Specifications: mark each item to record actual construction, including:
.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
.2 Changes made by Addenda and change orders.

.6 Other Documents: maintain manufacturer's certifications, guarantees, inspection certifications, field test records, required by individual specifications sections.

.7 Submit binder and electronic pdf file containing all the weekly construction photographs.

1.7 MATERIALS AND FINISHES

.1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations.
.1 Provide information for re-ordering custom manufactured products.

.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Moisture-Protection and Weather-Exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.4 Additional requirements: as specified in individual specifications sections.

1.8 SPARE MATERIALS

.1 Provide spare parts, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Deliver to site as directed; place and store as directed by Departmental Representative.

.4 Receive and catalogue items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

1.9 MAINTENANCE MATERIALS

.1 Provide maintenance and extra materials, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Deliver to site as directed; place and store.

.4 Receive and catalogue items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

1.10 SPECIAL TOOLS

.1 Provide special tools, in quantities specified in individual specification section.

.2 Provide items with tags identifying their associated function and equipment.

.3 Deliver to site as directed; place and store as directed by Departmental Representative.

.4 Receive and catalogue items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.

1.11 STORAGE, HANDLING AND PROTECTION

.1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.

.2 Store in original and undamaged condition, packaged and with manufacturer's seal and labels intact.

.3 Store components subject to damage from weather in weatherproof enclosures.

.4 Store paints and freezable materials in a heated and ventilated room.

.5 Remove and replace damaged products at own expense to satisfaction of Departmental Representative.

1.12 WARRANTIES AND BONDS

.1 Develop warranty management plan to contain information relevant to Warranties, Manufacturers' Guarantees and Bonds.

.2 Submit warranty management plan to Departmental Representative for approval.

.3 Warranty management plan to include required actions and documents to assure that Departmental Representative receives warranties to which it is entitled.

.4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.

.5 Submit, warranty information made available during construction phase, to Departmental Representative for approval prior to each monthly pay estimate.

.6 Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:
.1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
.2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
.3 Obtain warranties, manufacturers' guarantees and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten (10) days after completion of applicable item of work.
.4 Include special instructions.
.5 Include duties that Owner must undertake to maintain validity of warranty.
.6 Verify that documents are in proper form, contain full information, and are notarized.
.7 Co-execute submittals when required.
.8 Retain warranties and bonds until time specified for submittal.

.7 Except for items put into use with Departmental Representative's

permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.

.8 Include information contained in warranty management plan as follows:

.1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.

.2 Listing and status of delivery of Certificates of Warranty for extended warranty items.

.3 Provide list for each warranted equipment, item, feature of construction or system indicating:

.1 Name of item.

.2 Model and serial numbers.

.3 Location where installed.

.4 Name and phone numbers of manufacturers or suppliers.

.5 Names, addresses and telephone numbers of sources of spare parts.

.6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.

.7 Cross-reference to warranty certificates as applicable.

.8 Starting point and duration of warranty period.

.9 Summary of maintenance procedures required to continue warranty in force.

.10 Cross-Reference to specific pertinent Operation and Maintenance manuals.

.11 Organization, names and phone numbers of persons to call for warranty service.

.12 Typical response time and repair time expected for various warranted equipment.

.4 Contractor's plans for attendance at various required post-construction warranty inspections.

.5 Procedure and status of tagging of equipment covered by extended warranties.

.6 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

.9 Respond in timely manner to oral or written notification of required construction warranty repair work.

.10 Written verification to follow oral instructions. Failure to respond will be cause for the Departmental Representative to proceed with action against Contractor.

1.13 PRE-WARRANTY CONFERENCE

.1 Meet with Departmental Representative, to develop understanding of requirements of this section. Schedule meeting prior to contract completion, and at time designated by Departmental Representative.

.2 Departmental Representative will establish communication procedures for:

.1 Notification of construction warranty defects.
.2 Determine priorities for type of defect.
.3 Determine reasonable time for response.

.3 Provide name, telephone number and address of licensed and bonded company that is authorized to initiate and pursue construction warranty work action.

.4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

PART 2- PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3- PRODUCTS

3.1 NOT USED .1 Not Used.

PART 1- GENERAL

1.1 ADMINISTRATIVE REQUIREMENTS

.1 Demonstrate operation and maintenance of equipment and systems to personnel minimum one week prior to date of substantial performance and at completion of applicable phased work.

.2 Departmental Representative: provide list of personnel to receive instructions, and co-ordinate their attendance at agreed-upon times.

.3 Preparation:
.1 Verify conditions for demonstration and instructions comply with requirements.
.2 Verify designated personnel are present.
.3 Ensure equipment has been inspected and put into operation in accordance with commissioning requirements.
.4 Ensure testing, adjusting, and balancing have been performed in accordance with Section 01 91 13 - General Commissioning (Cx) Requirements and equipment and systems are fully operational.

.4 Demonstration and Instructions:
.1 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each item of equipment at agreed upon times.
.2 Instruct personnel in phases of operation and maintenance using operation and maintenance manuals as basis of instruction.
.3 Review contents of manual in detail to explain aspects of operation and maintenance.
.4 Prepare and insert additional data in operation and maintenance manuals when needed during instructions.

.5 Allot sufficient time for instruction of each item of equipment or system as follows:
.1 Section 11 41 26 – Walk-in Freezers and Cooler: 3.0 hours of instruction.
.2 Section 23 83 16 – Radiant Floor Heating: 1.0 hours of instruction.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit schedule of time and date for demonstration of each item of equipment and each system two weeks prior to designated dates, for Departmental Representative's approval.

.3 Submit for review and approval for each demonstration/training session:
.1 Instructor, complete with qualifications.
.2 Type of training:
.1 Classroom session.
.2 Demonstration.
.3 Detailed outline of content of training session:
.1 Include as required: start-up, operation and maintenance of required conditions, operating controls, limit controls, safety

controls, maintenance requirements, re-start after shutdown, review of operation and maintenance manuals, equipment troubleshooting, other.

.4 Session duration.

.5 Instructional materials:

.1 Include as required: demonstrations, operation manuals, maintenance manuals, as-built drawings, controls schematics, reports, commissioning reports.

.4 Submit reports within one week after completion of demonstration, that demonstration and instructions have been satisfactorily completed.

.1 Give time and date of each demonstration, with list of persons present.

.5 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

1.3 QUALITY ASSURANCE

.1 When specified in individual Sections requiring manufacturer to provide authorized representative to demonstrate operation of equipment and systems:

.1 Instruct Owner's personnel.

.2 Provide written report that demonstration and instructions have been completed.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

PART 1 - GENERAL

1.1 DEFINITIONS

.1 Section Includes:
.1 General requirements relating to commissioning of project's components and systems.

.2 Acronyms:
.1 Cx - Commissioning.
.2 O&M - Operation and Maintenance.
.3 TAB - Testing, Adjusting and Balancing.

1.2 GENERAL

.1 Cx is a planned program of checks carried out systematically on systems of the Project.

.2 Objectives:
.1 Verify components and systems are installed and operate in accordance with contract documents, design criteria and intent.
.2 Ensure appropriate documentation is compiled into the O&M Manual.
.3 Effectively train O&M staff.

.3 Contractor to participate fully in Cx process, operating equipment and systems, troubleshooting and making adjustments as required.

1.3 COMMISSIONING OVERVIEW

.1 Cx is conducted in concert with activities performed during stage of project delivery.

.2 Departmental Representative will issue Interim Acceptance Certificate when:
.1 Completed Cx documentation has been received, reviewed for suitability and approved by Departmental Representative.
.2 Equipment, components and systems have been commissioned.
.3 O&M training has been completed.

.3 Cx to be a line item of Contractor’s breakdown.

.4 Cx activities supplement field testing procedures described in relevant technical Sections.

1.4 NON-CONFORMANCE TO PERFORMANCE VERIFICATION REQUIREMENTS

.1 Should system components be incorrectly installed or malfunction during Cx, correct deficiencies, re-verify components within the un-functional system deemed required by Departmental Representative, to ensure effective performance.

.2 Costs for corrective work, additional tests, inspections, to determine acceptability and proper performance of such items to be borne by Contractor. Above costs to be in form of progress payment reductions or hold-back assessments.

1.5 PRE-CX REVIEW

.1 Before Construction:
.1 Review contract documents, confirm by writing to Departmental Representative.
.1 Adequacy of provisions for Cx.
.2 Aspects of design and installation pertinent to success of Cx.

.2 During Construction:
.1 Co-ordinate provision, location and installation of provisions for Cx.

.3 Before start of Cx:
.1 Have completed Cx Plan up-to-date.
.2 Ensure installation of related components, equipment and systems is complete.
.3 Fully understand Cx requirements and procedures.
.4 Have Cx documentation shelf-ready.
.5 Understand design criteria and intent and special features.
.6 Submit complete start-up documentation to Departmental Representative.
.7 Have Cx schedule up-to-date.
.8 Ensure systems have been cleaned thoroughly.
.9 Complete procedures on systems, submit reports to Departmental Representative for review and approval.
.10 Ensure "As-Built" system schematics are available.

.4 Inform Departmental Representative in writing of discrepancies and deficiencies on finished works.

1.6 CONFLICTS

.1 Report conflicts between requirements of this Section and other Sections to Departmental Representative before start-up and obtain clarification.

.2 Failure to report conflict and obtain clarification will result in application of most stringent requirement.

1.7 ACTION AND INFORMATIONAL SUBMITTALS: COMMISSIONING DOCUMENTATION

.1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
.1 Submit no later than 4 weeks after award of Contract:
.1 Name of Contractor's Cx agent.
.2 Draft Cx documentation.
.3 Preliminary Cx schedule.
.2 Request in writing to Departmental Representative for changes to submittals and obtain written approval at least 5 weeks prior to start of Cx.
.3 Submit proposed Cx procedures to Departmental Representative where not specified and obtain written approval at least 5 weeks prior to start of Cx.
.4 Provide additional documentation relating to Cx process required by Departmental Representative.

1.8 COMMISSIONING DOCUMENTATION

.1 Refer to Section 01 91 33 - Commissioning (Cx) Forms: Installation Check Lists and Static Verification (SV / Functional Performance Testing for requirements and instructions for use.

.2 Departmental Representative to review and approve Cx documentation.

.3 Provide completed and approved Cx documentation to Departmental Representative.

1.9 COMMISSIONING SCHEDULE

.1 Provide detailed Cx Schedule as part of construction schedule in accordance with Section 01 32 16 - Construction Progress Schedule only after all work has been pre-inspected and deficiencies corrected.

.2 Provide adequate time for Cx activities prescribed in technical sections and commissioning sections including:
.1 Approval of Cx forms and reports.
.2 Verification of reported results.
.3 Repairs, re-testing, re-commissioning, re-verification.
.4 Demonstration and training.

1.10 STARTING AND TESTING

.1 Contractor assumes liabilities and costs for inspections. Including disassembly and re-assembly after approval, starting, testing and adjusting, including supply of testing equipment.

1.11 WITNESSING OF COMMISSIONING ACTIVITIES

.1 Provide notice prior to commencement.

.2 Departmental Representative to be present and witness start-up and testing.

.3 Contractor's Cx Agent to be present at commissioning activities performed and documented by sub-trades, suppliers and product manufacturers.
.1 Contractor to have the following documentation on site for the Commissioning session:
.1 Drawings, specifications.
.2 Addendums and Change orders.
.3 Copies of warranty documentation.
.4 Reviewed shop drawings.
.5 Operation and maintenance manuals for all equipment, systems, components and accessories bound into indexed binder. Refer to Section 01 78 00 – Close-out Submittals.
.6 Cx forms.

1.12 MANUFACTURER'S INVOLVEMENT

.1 Use manufacturer's representative where specified.

.2 Integrity of warranties:

.1 Use manufacturer's representative as required to maintain integrity of warranty.

.3 Qualifications of manufacturer's personnel:
.1 Experienced in design, installation and operation of systems.
.2 To report results in clear, concise, logical manner.

1.13 PROCEDURES

.1 Verify that systems are complete, clean, and operating in normal and safe manner prior to conducting start-up, testing and Cx.

.2 Conduct start-up and testing in the following phases:
.1 Included in delivery and installation:
.1 Verification of conformity to specification, approved shop drawings.
.2 Visual inspection of quality of installation.
.2 Start-up: follow accepted start-up procedures.
.3 Operational testing: document equipment performance.
.4 Functional Performance Testing: include repetition of tests after correcting deficiencies.
.5 Post-substantial Functional Performance Testing: to include fine-tuning.

.3 Correct deficiencies and obtain approval from Departmental Representative after distinct phases have been completed and before commencing next phase.

.4 Components and systems:
.1 If evaluation report concludes that deficiencies are minor, implement corrective measures approved by Departmental Representative.
.2 If evaluation report concludes that deficiencies are major and/or damage has occurred, Departmental Representative shall reject equipment.
.1 Rejected components/systems are to be removed from site and replaced with new.
.2 Subject new components/systems to evaluation.

1.14 START-UP DOCUMENTATION

.1 Assemble start-up documentation and submit to Departmental Representative for review and approval before commencement of commissioning.

.2 Star-up documentation to include:
.1 Pre-start-up Inspection Reports.
.2 Installation Checklists.
.3 Start-up Reports.
.4 Itemized detailed description of complete start-up procedures, step-by-step (suitable for use in the event start-up has to be repeated in the future).

1.15 OPERATION AND MAINTENANCE OF SYSTEMS

.1 After start-up, operate and maintain equipment and systems as directed by equipment/systems manufacturer.

.2 With assistance of manufacturer develop written maintenance program

and submit to Departmental Representative for approval.

.3 Operate and maintain systems for length of time required for commissioning to be completed.

.4 After completion of commissioning, operate and maintain systems until issuance of Substantial Performance.

1.16 TEST RESULTS

.1 If start-up, testing and/or Functional Performance Testing produce unacceptable results, repair, replace or repeat start-up, testing and/or Functional Performance Testing specified procedures until acceptable results are achieved.

.2 Provide manpower and materials and assume costs for re-commissioning.

1.17 INSTUMENTS AND EQUIPMENT

.1 Provide all instruments and equipment required.

.2 Provide ladders and other means of access as required.

1.18 COMMISSIONING FUNCTIONAL PERFORMANCE TESTING

.1 Carry out Cx:
.1 Under operating conditions (simulated if required), over full operating range, in all modes.
.2 On independent and interacting systems.

.2 Cx procedures must be repeatrable and reported rults must be verifiable.

.3 Follow equipment /systems manufacturer’s operating instructions.

1.19 WITNESSING COMMISSIONING

.1 Contractor and Departmental Representative to witness activities and verify results.

1.20 SUNDRY CHECKS AND ADJUSTMENTS

.1 Make adjustments and changes which become apparent as Cx proceeds.

1.21 DEFICIENCIES, FAULTS, DEFECTS

.1 Correct deficiencies found during Cx to satisfaction of Departmental Representative.

.2 Report problems, faults or defects affecting Cx to Departmental Representative in writing. Proceed with written approval from Departmental Representative.

1.22 COMPLETION OF COMMISSIONING

.1 Upon completion of Cx leave systems in normal operating mode.

.2 Except for warranty and seasonal verification activities specified in Cx specifications, complete Cx prior to issuance of Interim Certificate of Completion.

.3 Cx to be considered complete when contract Cx deliverables have been submitted and accepted by Departmental Representative.

1.23 ACTIVITIES UPON COMPLETION OF COMMISSIONING

.1 When changes are made to components or systems settings during Cx process, provide updated Cx form for affected item(s).

1.24 DEMONSTRATION AND TRAINING

.1 Perform demonstration and training of Owner's representatives in accordance with Section 01 79 00 - Demonstration and Training.

1.25 MAINTENANCE MATERIALS, SPARE PARTS, SPECIAL TOOLS

.1 Supply, deliver, and document maintenance materials, spare parts, and special tools as specified in contract.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

PART 1 - GENERAL

1.1 GENERAL

.1 Term "Cx" in this section means "Commissioning".

.2 Acronyms:
- .1 Cx - Commissioning.
- .2 MSDS - Material Safety Data Sheets.
- .3 FPT – Functional Performance Testing.
- .4 SV – Static Verification.
- .5 TAB - Testing, Adjusting and Balancing.
- .6 WHMIS - Workplace Hazardous Materials Information System.

.3 Purpose of Cx Plan:

.1 The purpose of the commissioning plan is to provide direction for the commissioning process during construction, to provide resolution for issues such as scheduling, to outline roles and responsibilities, lines of communication and reporting, approvals, and coordination.

.4 Cx Plan Goals and Objectives:

.1 Commissioning is a systematic process of ensuring that the building systems perform according to the design intent and the owner's operational requirements.

- .1 All equipment and systems should be installed according to manufacturer's recommendations and the best practices and standards of the industry.

.2 Commissioning is to include documenting the design intent, followed by activities in the construction, acceptance, and warranty phases of the project. The participation of the contractor in commissioning activities is to follow the requirements defined in the specifications.

.3 Goals:

- .1 To facilitate the final acceptance of the project at the earliest date.
- .2 To facilitate the transfer of the project to the owner and the owner's maintenance staff.
- .3 To ensure that the systems meet the requirements of the owner.
- .4 To document that equipment is installed and started per manufacturer's instructions and recommendations.
- .5 To document that equipment and systems receive complete operational checkout by installing contractors.
- .6 To document system performance with thorough functional performance testing and monitoring.
- .7 To verify the completeness of operations and maintenance materials.
- .8 To ensure that the owner's operating personnel are adequately trained on the operation and maintenance of the installed equipment and systems.

1.2 DEVELOPMENT OF 100% CX PLAN

.1 Cx Plan is 95% complete.

.2 Submit 100% Cx Plan within eight (8) weeks of award of contract to take into account:
.1 Approved shop drawings and product data.
.2 Approved changes to contract.
.3 Contractor's project schedule.
.4 Cx schedule.
.5 Contractor's, sub-contractors', manufacturers'/suppliers' requirements.
.6 Project construction team's and Cx team's requirements.

.3 Submit completed Cx Plan to Departmental Representative and obtain written approval.

1.3 REFINEMENT OF CX PLAN

.1 During construction phase, revise, refine and update Cx Plan to include:
.1 Changes resulting from Client program modifications.
.2 Approved design and construction changes.

.2 Submit each revised Cx Plan to Departmental Representative, complete with revision number and date, for review and obtain written approval.

.3 Include testing parameters at full range of operating conditions and check responses of equipment and systems.

1.4 COMPOSITION, ROLES AND RESPONSIBILITIES OF CX TEAM

.1 The Contractor is to designate a Cx agent who coordinates commissioning activities and reports to the Departmental Representative. The Contractor's commissioning activities are detailed in the specification Sections.

.2 Members of the Cx team are to work together to fulfill responsibilities and meet objectives of the Contract Documents.

.3 Cx Team roles and Responsibilities:
.1 Contractor's Cx agent:
.1 Coordinates Cx process and implements Cx activities, including:
.1 Writes and reviews testing plans.
.2 Directs and documents performance testing.
.3 Completes commissioning forms.
.4 Prepares and submits reports
.5 Prepares and submits Operation and maintenance Manuals.
.6 Organizes demonstration and training.
.2 Owner's representative:
.1 Coordinates user staff and maintenance staff in commissioning activities.
.2 Conducts periodic site reviews to observe general progress.
.3 Reviews documentation from an operational

perspective.
.4 Monitors Cx activities, training and development of Cx documentation.
.3 General contractor:
.1 Facilitates Cx process and ensures sub-contractors perform their responsibilities;
.2 Integrates Cx into the construction process and construction schedule.
.4 Construction team: (sub-contractors, suppliers and equipment/systems manufacturer's representatives responsible for construction/installation in accordance with Contract Documents)
.1 Comply with specification requirements.
.2 Performs Cx activities.
.3 Conduct static verification.
.4 Conduct start-up.
.5 Conduct functional performance testing.
.6 Demonstrates satisfactory equipment/system performance.
.7 Delivers Cx documentation.
.8 Prepares and conducts demonstration and training.
.9 Equipment/systems Manufacturers' Representatives:
.1 To participate and provide documentation to facilitate commissioning work,
.2 To assist in start-up, testing and other duties as indicated in technical specification Sections.
.5 Owner's Staff/Users:
.1 Review O&M documentation, attend demonstration and training.
.2 Participate in commissioning tasks and performance testing as required.
.6 Departmental Representatives (Architectural and Engineering):
.1 Perform field reviews and documents in accordance with professional standards.
.2 Witness system testing.
.3 Review Cx submittals and reports.
.4 Review O&M Manual submission.
.5 Assist in resolving issues.

1.5 CX PARTICIPANTS - GENERAL

.1 Employ the following Cx participants to verify performance of equipment and systems:
.1 Installation contractor/subcontractor:
.1 Equipment and systems.
.2 Equipment/systems manufacturer: Equipment specified to be installed and started by manufacturer including Functional Performance Testing.

.2 Ensure that Cx participant:
.1 Is able to complete work within scheduled time frame.
.2 Is available for emergency and troubleshooting service during first year of occupancy by user for adjustments and modifications outside responsibility of O&M personnel.

.3 Provide for review, names of participants to Departmental

Representative and details of instruments and procedures to be followed for Cx, prior to starting date of Cx for review and approval.

1.6 EXTENT OF CX

.1 Commissioning language in the specification Section details the scope of commissioning for this project. The following lists the equipment/systems that are to be commissioned.

.2 Cx systems and equipment:
- .1 Refrigeration equipment
- .2 Radiant floor heating system

1.7 CX DELIVERABLES

.1 Cx Process Deliverables:
- .1 Cx specifications.
- .2 Start-up, pre-Cx activities and documentation for equipment and systems.
- .3 Completed report forms:
  - .1 Checklists
  - .2 Static verification.
  - .3 Start-up.
  - .4 Functional Performance Testing.
- .4 Results of Functional Performance Tests and Inspections.
- .5 Description of Cx activities.
- .6 Demonstration and training plans.
- .7 Prescribed activities during warranty period.

.2 O&M Deliverables:
- .1 Project record documentation.
  - .1 Include electrical panels inventory with detailed inventory of electrical circuitry for each panel. (Duplicate of inventory mounted inside each panel.
- .2 WHMIS MSDS documentation.
- .3 Warranties.

1.8 COMMISSIONING PROCESS

.1 The following indicates commissioning process by commissioning task or activity.

.2 Commissioning Meeting:
- .1 The commissioning meeting brings together all members of the design, construction, and operations team that will be involved in the commissioning process.
- .2 Each building system to be commissioned is addressed, including commissioning requirements, and completion and start-up schedules.
- .3 During the scoping meeting, all parties agree on the scope of work, tasks, schedules, deliverables, and responsibilities for implementation of the Commissioning Plan.

.3 Final Commissioning Plan:
- .1 The commissioning agent is to finalize the draft Commissioning

Plan using the information gathered from the meeting.
.2 The initial commissioning schedule is developed along with a timeline. The timeline is fine-tuned as construction progresses.

.4 Design Intent Documentation:
.1 Design requirements, relative to the building systems selected for commissioning, must be understood in order to establish a baseline of performance expectations to which the actual installed performance is compared. The commissioning provider, with the assistance of the commissioning team is to document the design intent for those building systems selected for commissioning. The Design Intent Summary is to reflect the requirements in the construction documents.

.5 Submittals - General:
.1 The general contractor is to provide the commissioning agent with equipment and system submittals. Refer to specification Sections for specifics. The equipment data is to include installation and start-up procedures, O&M data, performance data and temperature control drawings and functional performance testing procedures.
.2 Any changes to design intent or operating parameter changes, added control strategies and sequences of operation etc. that may affect commissioned systems will be issued only in the form of a written Change Order signed by the Owner authorizing the modification.

.6 Site Observation:
.1 The commissioning agent is to make periodic site visits to witness equipment and system installations, coordinated with the general contractor's site supervisor. The commissioning agent is to attend selected planning and job-site meetings in order to remain informed on construction progress and to update parties involved in commissioning.

.7 Static Verification:
.1 Static Verification installation checklists are to be developed and completed for:
.1 Walk-in Freezer boxes.
.2 Refrigeration equipment/systems for Walk-in Freezers and Cold Room.
.3 Radiant underfloor heating systems for each Walk-in Freezer.
.2 Each checklist is to include the equipment nameplate and characteristics data, and confirm the as-built status of the equipment or system.
.3 The checklist is to ensure that the systems are complete and operational and document the installation of components and completion of systems.
.4 Checklists are to be prepared by the commissioning agent from manufacturer's data, drawings and specifications.
.5 The commissioning agent is to review and verify the completed checklists before start-up.

.8 Start-up:
.1 Equipment manufacturer, supplier, installing specialized contractor to start-up under the Contractor's direction, the following systems:
.1 Refrigeration equipment/systems for Walk-in Freezers

and Cold Room.

.2 Radiant underfloor heating systems.

.2 Departmental Representative to monitor some of these activities.

.3 Contractor to rectify deficiencies to satisfaction of Departmental Representative.

.9 Development of Functional Test and Verification Procedures:

.1 Functional performance testing verifies the intended operation of individual components and system interactions under various conditions and modes of operation. The systems are run through all of the sequences of operation and the response of components is verified. Testing proceeds from components to subsystems to systems, and finally to interlocks and connections between systems

.2 The commissioning agent is to prepare functional performance test plans to suit project requirements so that the complete sequence of operations is included. The commissioning agent is to obtain all documentation, including an updated points list, control sequences, and set-points. If necessary, the commissioning agent may request clarifications from contractors and the design team regarding sequences and operation.

.3 The commissioning agent is to provide a copy of the primary equipment tests to the installing subcontractor and general contractor who can review the tests for feasibility, safety, warranty and equipment protection.

.10 Execution of Functional Testing Procedures:

.1 The commissioning agent is to schedule functional tests through the general contractor and subcontractors. Under the supervision of the commissioning agent, the installing subcontractor performs the hardware manipulations required for the testing.

.2 Owner maintenance staff may also be present in order to assist in system observations.

.3 The commissioning agent witnesses and records the results of functional performance testing on forms.

.4 Departmental Representative to review functional performance testing reports.

.5 Any deficiencies found from functional performance testing are to be documented in a Deficiency Report. The report is to include all details of the components or systems found to be non-compliant with the parameters of the functional performance test plans and design documents. The deficiency report will become part of the punch list. The report is to detail the adjustments or alterations required to correct the system operation, and identify the responsible party. The deficiency report is to be continuously updated. The commissioning agent is to schedule any required re-testing through the general contractor. Decisions regarding deficiencies and corrections are made between commissioning agent, sub-contractor and general contractor.

.11 Diagnostic Monitoring:

.1 Short-term monitoring is to occur after occupancy to evaluate the systems' performance under natural occupancy and ambient load conditions. The objective is to evaluate the effectiveness of the system in meeting the requirements of the users.

.12 Operation and Maintenance Manuals:

.1 Operation and maintenance manuals are to be prepared by the contractors for the owner's maintenance personnel and are to be submitted to the Departmental Representative who will review for completeness. The general contractor is to submit O&M manuals at the earliest possible date. Materials may be added, or requested from the contractors, to stress and enhance the importance of system interactions, troubleshooting, and long-term preventative maintenance and operation. Include warranty documentation.
.2 Refer to Section 01 78 00 – Close-out Submittals for general requirements and individual specification Sections for specific requirements.

.13 Demonstration and Training of Owner Personnel:
.1 The commissioning agent is to assist the owner and general contractor in organizing the training sessions by identifying the appropriate staff for each session and creating an overall training plan
.2 For each training session, the contractors are to provide a detailed agenda for each piece of equipment or system for which training is required. The agenda is to describe the training scope, duration, and methods, along with the name and qualifications of the trainers. The commissioning agent is to develop a plan for including in the training session contractors / trainers from different disciplines, when appropriate. The trainer is to document each training session (duration, general subjects covered, and attendees). The commissioning agent may witness any of the training sessions
.3 Refer also to Section 01 79 00 – Demonstration and Training.

.14 Activities during Warranty Period:
.1 Variation in operations or control strategies may require additional testing to verify system performance. During the warranty period other deferred testing is to be completed as required to fully test all sequences of operation. The commissioning agent is to coordinate this activity. Tests are executed and deficiencies corrected by the appropriate subcontractors, witnessed by facilities staff and the commissioning agent. Any final adjustments to the O&M manuals and project record documents due to the testing are to be made.
.2 The commissioning agent is to request input from the owner's designated representative about the performance of the building systems.
.3 The commissioning agent is to support the general contractor's troubleshooting process during the warranty period. The general contractor's warranty team will first try and resolve the issues before requesting assistance from the commissioning agent.

.15 Commissioning Report:
.1 A Final Commissioning Report is to be compiled which summarizes all of the tasks, findings, and documentation of the commissioning process.
.2 The report is to include copies completed and certified Static Verification, Start-up and Functional Performance Testing Forms.
.3 The report is to address the actual performance of the equipment/systems in reference to the design documents. All test reports by various sub-contractors, manufacturers and controlling authorities are to be incorporated into the final report
.1 An evaluation of the operating condition of the systems at the time of functional test completion.

.2 Deficiencies that were discovered and the measures taken to correct them.
.3 Functional performance test procedures and results.
.4 Reports that document all commissioning field activities as they progressed.
.5 Description and estimated schedule of required deferred testing.

.4 Documentation to be computer-compatible format.

1.9 CX SCHEDULE: - GENERAL

.1 Ensure the following sequential priorities are followed:
.1 Equipment is not “temporarily” started until pre-start checklist items and all manufacturers’ pre-start procedures are completed and moisture, dust and other environmental and building integrity issues have been addressed.
.2 Functional performance testing does not begin until pre-functional, start-up and TAB is completed for a given system .
.3 The controls system and equipment it controls are not functionally tested until all points have been calibrated and pre-functional checklists are completed

1.10 STATIC VERIFICATION FORMS

.1 Refer to Section 01 91 33 - Commissioning (Cx) Forms.

1.11 START-UP FORMS

.1 Refer to Section 01 91 33 - Commissioning (Cx) Forms.

1.12 FUNCTIONAL PERFORMANCE VERIFICATION FORMS

.1 Refer to Section 01 91 33 - Commissioning (Cx) Forms.

1.13 CX SCHEDULE

.1 Submit Commissioning Plan Schedule to Departmental Representative for review. Include:
.1 Milestones, testing, documentation, training and Cx activities of components, equipment, subsystems, systems and integrated systems.

.2 Preliminary Outline Commissioning Schedule as follows: (include columns for duration, start date and completion date)
.1 Document Understanding of Design Intent
.2 Commissioning Plan
.1 Contractor submits Preliminary Commissioning Plan
.2 Commissioning Meeting
.3 Contractor submits Final Commissioning Plan
.3 Submittals and Test Writing
.1 Contractor submits for review:

.2 Submittals as identified in specification Sections
.1 Submittals reviewed by Departmental Representative
.3 Contractor writes and submits for review unfilled: Installation Checklist/Static Verification Forms.
.1 Forms submission reviewed by Departmental Representative.
.4 Contractor writes and submits for review technical procedures for Start-up of equipment/systems.
.1 Start-up submission reviewed by Departmental Representative.
.5 Contractor writes and submits for review technical procedures for Functional Performance Tests
.1 Functional Performance Tests submission reviewed by Departmental Representative.

.4 Construction Observation
.1 Site observations by Departmental Representative, complete with Reports.
.2 Site observations by manufacturer's representatives as identified in specification Sections, complete with Reports.

.5 Contractor completes:
.1 Static Verification:
.1 Contractor participates together with Departmental Representative in Static Verification.
.2 Start-up.
.1 Contractor confirms all pre-start-up-related technical procedures have been completed, results documented.
.2 Contractor adequately resolves discrepancies and documents.
.3 Contractor confirms systems are ready for start-up.
.4 Contractor performs Start-up and submits related documentation for review by Departmental Representative.
.3 Functional Performance Testing.
.1 Contractor undertakes functional performance testing.
.2 Departmental Representative witnesses testing.
.3 Contractor satisfactorily rectifies deficiencies
.4 Contractor completes and submits Performance Verification Reports for review by Departmental Representative.
.4 Owner Accepts Handover of Commissioned System
.1 Owner Move-in
.2 Contractor performs Short Term Diagnostic Monitoring
.1 Contractor makes adjustments as required.
.5 Final Inspection, Close-out Submittals, Demonstration and Training
.1 Field Review
.1 Departmental Representative completes Field Review and Report with deficiencies noted.

.1 Contractor satisfactorily rectifies deficiencies.
.2 Departmental Representative completes Final Field Review and Report.

.2 O&M Manuals
.1 Contractor submits for review O&M Manuals
.2 O&M manuals reviewed by Departmental Representative
.3 Contractor satisfactorily completes O&M Manual submission

.3 Warranty Documentation
.1 Contractor submits for review warranty documentation
.2 Warranty documentation reviewed by Departmental Representative.
.3 Contractor satisfactorily completes Warranty Documentation submission.

.4 As-built Documentation
.1 Contractor submits recorded As-built Documentation.

.5 Demonstration and Training
.1 Contractor organizes and conducts demonstration and training sessions as identified in specification Sections.
.2 Contractor confirms that operators have received required training.

.6 Contractor completes any required Deferred Testing.

.6 Final Commissioning Report
.1 Contractor submits for review Final Commissioning Report documentation.
.2 Final Commissioning Report accepted.

.7 Resolution of Warranty Issues:
.1 Owner documents warranty issues as they arise during warranty period and informs Departmental Representative.
.2 Warranty issues addressed as they arise before warranty expiration.

1.14 CX REPORTS

.1 Include completed and certified Static Verification, Start-up and Functional Performance Testing forms in Cx Reports.

.2 Before reports are accepted, reported results subject to review by Departmental Representative.

1.15 PRELIMINARY AND FINAL CX

.1 Phased start-up of refrigeration equipment and radiant floor heating will require phased Cx. Refer to other Sections for construction phasing.

1.16 TESTS TO BE PERFORMED BY OWNER/USER

.1 None anticipated on this project.

1.17 FINAL SETTINGS

.1 Upon completion of Cx to satisfaction of Departmental Representative place/lock control devices in their final positions, indelibly mark settings and include in Cx Reports and O&M Manual.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

PART 1 - GENERAL

1.1 GENERAL

.1 Commissioning forms to be written and completed for equipment, system and integrated system.

.2 Include the following data:
.1 Product manufacturer's installation instructions and recommended checks.
.2 Special procedures as specified in relevant technical sections.
.3 Items considered good installation and engineering industry practices deemed appropriate for proper and efficient operation.

.3 Prepare project-specific forms in electronic format and submit to Departmental Representative for approval prior to use

1.2 INSTALLATION CHECKLISTS

.1 Installation Checklists:
.1 Equipment manufacturers' support in developing the installation/start-up checklists is a requirement. Submit project specific installation /start-up check lists to Departmental Representative for review. As deemed necessary by Departmental Representative supplement check lists as required for specific project conditions.

.2 Use check lists for equipment installation. Document checklist verifying checks have been made. Indicate deficiencies and corrective action taken.

.3 Installer to sign check lists upon completion, certifying stated checks and inspections have been performed. Return completed checklists to Departmental Representative. Checklists will be required during Commissioning and will be included in final Commissioning Report and O&M Manuals.

.4 Use of check lists will be stringently used for equipment pre-start and start-up procedures.

.5 Checklists to indicate date, project name and number.

1.3 STATIC VERIFICATION FORMS

.1 Static Verification Report Forms:
.1 Compile gathered data on items of equipment produced by equipment manufacturer, includes nameplate information, parts list, operating instructions, maintenance guidelines and pertinent technical data and recommended checks that is necessary to prepare for start-up and functional testing and used during operation and maintenance of equipment. This documentation is to be included in Operation and Maintenance Manual at completion of work.

.2 Prior to Functional Performance Testing of systems, complete items on Static Verification Forms related to systems, submit to Departmental Representative for review and obtain Departmental Representative's

approval.

.3 Static Verification Forms to include date, project name and number.

1.4 FUNCTIONAL PERFORMANCE TESTING FORMS/REPORTS

.1 Functional Performance Testing Forms/Reports:
.1 Functional Performance Testing Forms are to be used for checks, running dynamic tests and adjustments carried out on equipment and systems to ensure correct operation, efficiently and function independently and interactively with other systems as intended with project requirements.
.2 FPT report forms include those developed by Contractor records measured data and readings taken during functional testing and performance verification procedures.
.3 Prior to FPT of integrated system, complete FPT forms of related systems, submit to Departmental Representative for review and obtain Departmental Representative's approval.

.2 FPT forms to include date, project name and number.

1.5 SAMPLES OF COMMISSIONING FORMS

.1 Sample Forms are provided at the end of this Section.

.2 Revise items on commissioning Forms as required to suit project requirements.

1.6 DEVELOPMENT OF NEW COMMISSIONING FORMS

.1 When additional forms are required, develop appropriate forms and submit to Departmental Representative prior to use.

.2 Additional forms to be in same format as those provided by Departmental Representative.

1.7 COMMISSIONING FORMS

.1 Prepare project-specific Commissioning Forms in electronic format and submit to Departmental Representative for approval prior to use.

.2 Use Commissioning forms to verify installation and record performance when starting equipment and systems.

.3 Strategy for Use:
.1 Contractor to prepare project-specific Commissioning forms with Specification data included.
.2 Contractor to provide required shop drawings information and verify correct installation and operation of items indicated on these forms.
.3 Confirm operation as per design criteria and intent.
.4 Identify variances between design and operation and reasons for variances.
.5 Verify operation in specified normal and emergency modes and under specified load conditions.
.6 Record analytical and substantiating data.

.7 Verify reported results.
.8 Form to bear signatures of recording technician and reviewed and signed off by Departmental Representative.
.9 Submit immediately after tests are performed.
.10 Reported results in true measured SI unit values.
.11 Provide Departmental Representative with originals of completed forms.
.12 Maintain copy on site during start-up, testing and commissioning period.
.13 Forms to be both hard copy and electronic format with typed written results. Bind in O&M Manual.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

COMPRESSOR UNIT

Static Verification

FRANCOIS CLAUZADE | CINDY GIBSON | architects
211-161 Stafford Street
Winnipeg MB R3M 2W9
t.204.474.2574 t.204.453.5042

REVISION #: _____

NAME: _____
COMPANY: _____
ADDRESS: _____

CUSTOMER: SMI - CSI
PROJECT: C-17 Freezer Replacement
FILE NUMBER: R.086718.001
DATE: DD / MM / YYYY

NAMEPLATE			
MANUFACTURER		EQUIPMENT NO.	
SERVICE		LOCATION	

COMPRESSOR	**SPECIFIED**	**SHOP DRAWINGS**	**INSTALLED**
MANUFACTURER			
MODEL NO.			
LOCATION			
TYPE			
SERIAL NO.			
MOTOR MCA			
VOLTAGE / PHASE / FREQUENCY			
REFRIGERANT {TYPE} INSTALLED			
LINE SET			

COMPRESSOR	**STATUS**	**COMMENTS**
LEFT BLANK FOR INDIVIDUAL TO POPULATE		

GENERAL COMMENTS:

POSITION/TITLE	**SIGNATURE**	**DATE**

COMPRESSOR UNIT

Functional Performance Testing

FRANCOIS CLAUZADE | CINDY GIBSON | architects
211-161 Stafford Street
Winnipeg MB R3M 2W9
t.204.474.2574 t.204.453.5042

REVISION #: _____

NAME:		CUSTOMER:	SMI - CSC
COMPANY:		PROJECT:	C-17 Stores Freezer Replacement
ADDRESS:		FILE NUMBER:	R.086718.001
		DATE:	DD / MM / YYYY

CONTROL SEQUENCE REVIEWED AND OPERATIONAL TO SPECIFICATIONS	
CONNECTION TO REFRIGERATION UNIT IN PLACE AND FULLY COMMUNICATING	

GENERAL COMMENTS:

POSITION/TITLE	SIGNATURE	DATE

COMPRESSOR UNIT

Start-up

FRANCOIS CLAUZADE | CINDY GIBSON | architects
211-161 Stafford Street
Winnipeg MB R3M 2W9
t.204.474.2574 t.204.453.5042

REVISION #: _____

NAME:		CUSTOMER:	SMI - CSC
COMPANY:		PROJECT:	C-17 Stores Freezer Replacement
ADDRESS:		FILE NUMBER:	R.086718.001
		DATE:	DD / MM / YYYY

VOLTAGE AND AMPERAGE MEASUREMENT	
MANUFACTURER'S START-UP CHECKLIST COMPLETE	
START-UP CHECKLIST & PROCEDURES PROVIDED TO DEPARTMENTAL REPRESENTATIVE	

GENERAL COMMENTS:

POSITION/TITLE	SIGNATURE	DATE

CONDENSING UNIT

Static Verification

FRANCOIS CLAUZADE | CINDY GIBSON | architects
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Winnipeg MB R3M 2W9
t.204.474.2574 t.204.453.5042

REVISION #: _____

NAME: _____
COMPANY: _____
ADDRESS: _____

CUSTOMER: SMI - CSI
PROJECT: C-17 Freezer Replacement
FILE NUMBER: R.086718.001
DATE: DD / MM / YYYY

NAMEPLATE			
MANUFACTURER		EQUIPMENT NO.	
SERVICE		LOCATION	

EVAPORATOR	**INSTALLED**		
MANUFACTURER			
MODEL NO.			
LOCATION			
TYPE			
SERIAL NO.			
MOTOR MCA			
VOLTAGE / PHASE / FREQUENCY			
REFRIGERANT {TYPE} INSTALLED			
LINE SET			

EVAPORATOR	**STATUS**	**COMMENTS**
INSTALLATION & MOUNTING		
PIPING CONNECTIONS		
ACCESS FOR SERVICING		
PIPING INSULATION		
ISOLATING/BALANCING VALVES		
THERMOSTAT INSTALLED		
VIBRATION & NOISE		

GENERAL COMMENTS:

POSITION/TITLE	**SIGNATURE**	**DATE**

CONDENSING UNIT

Start-up

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Winnipeg MB R3M 2W9
t.204.474.2574 t.204.453.5042

REVISION #: _____

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COMPANY:		PROJECT:	C-17 Stores Freezer Replacement
ADDRESS:		FILE NUMBER:	R.086718.001
		DATE:	DD / MM / YYYY

VOLTAGE AND AMPERAGE MEASUREMENT	
MANUFACTURER'S START-UP CHECKLIST COMPLETE	
START-UP CHECKLIST PROVIDED TO DEPARTMENTAL REPRESENTATIVE	
REFRIGERANT CHARGE CHECKED AND RECORDED	
THERMAL EXPANSION VALVE INSTALLED IN CORRECT LOCATION	
ADEQUATE ACCESS FOR COIL CLEANING AND MAINTENANCE	
FINS UNDAMAGED	

GENERAL COMMENTS:

POSITION/TITLE	SIGNATURE	DATE

CONDENSING UNIT

Functional Performance Testing

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211-161 Stafford Street
Winnipeg MB R3M 2W9
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COMPANY:		PROJECT:	C-17 Stores Freezer Replacement
ADDRESS:		FILE NUMBER:	R.086718.001
		DATE:	DD / MM / YYYY

CONTROL SEQUENCE REVIEWED AND OPERATIONAL TO SPECIFICATIONS	
CONNECTION TO REFRIGERATION UNIT IN PLACE AND FULLY COMMUNICATING	

GENERAL COMMENTS:

POSITION/TITLE	SIGNATURE	DATE

EVAPORATOR

Static Verification

FRANCOIS CLAUZADE | CINDY GIBSON | architects
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Winnipeg MB R3M 2W9
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CUSTOMER: SMI - CSI
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FILE NUMBER: R.086718.001
DATE: DD / MM / YYYY

NAMEPLATE			
MANUFACTURER		EQUIPMENT NO.	
SERVICE		LOCATION	

EVAPORATOR	**SPECIFIED**	**SHOP DRAWINGS**	**INSTALLED**
MANUFACTURER			
MODEL NO.			
LOCATION			
TYPE			
SERIAL NO.			
MOTOR MCA			
VOLTAGE / PHASE / FREQUENCY			
REFRIGERANT {TYPE} INSTALLED			
LINE SET			

EVAPORATOR	**STATUS**	**COMMENTS**
WIRING IN ACCORDANCE WITH CODES		
REFRIGERANT LINES PROPERLY SIZED		
PIPING INSULATION		
INSTALLATION, CLEARANCES & MOUNTING		
EVACUATION & DEHYDRATION PERFORMANCE COMPLETE		
DRAIN PAN SLOPE VERIFIED		
DRAIN LINE INSULATION & HEAT TRACE		
PIPING CONNECTIONS		

GENERAL COMMENTS:

POSITION/TITLE	**SIGNATURE**	**DATE**

EVAPORATOR

Start-up

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Winnipeg MB R3M 2W9
t.204.474.2574 t.204.453.5042

REVISION #: _____

NAME:		CUSTOMER:	SMI - CSC
COMPANY:		PROJECT:	C-17 Stores Freezer Replacement
ADDRESS:		FILE NUMBER:	R.086718.001
		DATE:	DD / MM / YYYY

VOLTAGE AND AMPERAGE MEASUREMENT	
MANUFACTURER'S START-UP CHECKLIST COMPLETE	
START-UP CHECKLIST & PROCEDURES PROVIDED TO DEPARTMENTAL REPRESENTATIVE	
REFRIGERANT CHARGE CHECKED AND RECORDED	
THERMAL EXPANSION VALVE INSTALLED IN CORRECT LOCATION & SET	

GENERAL COMMENTS:

POSITION/TITLE	SIGNATURE	DATE

EVAPORATOR

Functional Performance Testing

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ADDRESS:		FILE NUMBER:	R.086718.001
		DATE:	DD / MM / YYYY

CONTROL SEQUENCE REVIEWED AND OPERATIONAL TO SPECIFICATIONS	
CONNECTION TO REFRIGERATION UNIT IN PLACE AND FULLY COMMUNICATING	
DEFROST UNIT FUNCTIONING	

GENERAL COMMENTS:

POSITION/TITLE	SIGNATURE	DATE

RADIANT FLOOR HEATING SYSTEM

Static Verification

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REVISION #: _____

NAME:		CUSTOMER:	SMI - CSC
COMPANY:		PROJECT:	C-17 Stores Freezer Replacement
ADDRESS:		FILE NUMBER:	R.086718.001
		DATE:	DD / MM / YYYY

NAMEPLATE			
MANUFACTURER		EQUIPMENT NO.	
SERVICE		LOCATION	

VERIFICATION ACTIVITIES	**EQUIPMENT NUMBER**	**STATUS**			**COMMENTS**
		YES	**NO**	**N/A**	
HEAT EXCHANGER					
HYDRONIC CIRCULATION PUMP					
MANIFOLD					
CONTROL VALVES VERIFIED					
TEMPERATURE SENSORS/ALARMS VERIFIED					
SLAB SENSOR VERIFIED					
FLOW MEASURING DEVICES VERIFIED					
GLYCOL TANK					
GLYCOL CONCENTRATION					
GLYCOL FILL SYSTEM					
BALANCING COMPLETE					
ADEQUATE ACCESS FOR MAINTENANCE					
SYSTEM READY FOR FUNCTIONAL PERFORMANCE TESTING					

GENERAL COMMENTS:

POSITION/TITLE	**SIGNATURE**	**DATE**
Building Owner/Representative		
Building Operations and Maintenance Staff		
Cx Authority/ Commissioning Provider		
Design Consultants		
Contractors/Subcontractor		
Manufacturer's Representatives		

RADIANT FLOOR HEATING SYSTEM

Start-up

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211-161 Stafford Street
Winnipeg MB R3M 2W9
t.204.474.2574 t.204.453.5042

REVISION #: _____

NAME:		CUSTOMER:	SMI - CSC
COMPANY:		PROJECT:	C-17 Stores Freezer Replacement
ADDRESS:		FILE NUMBER:	R.086718.001
		DATE:	DD / MM / YYYY

MANUFACTURER'S START-UP CHECKLIST COMPLETE

START-UP CHECKLIST & PROCEDURES SUBMITTED TO DEPARTMENTAL REPRESENTATIVE

PRESSURE TESTING OF TUBING BEFORE OVERPOUR IS INSTALLED

PRESSURE TESTING DURING OVERPOUR INSTALLATION

CONFIRM OVERPOUR IS CURED BEFORE PROCEEDING

FILLING SYSTEM & AIR PURGING

FiILLING SYSTEM

PURGING AIR FROM SYSTEM

BALANCING OF MANIFOLD LOOPS

GENERAL COMMENTS:

POSITION/TITLE	SIGNATURE	DATE
Building Owner/Representative		
Building Operations and Maintenance Staff		
Cx Authority/ Commissioning Provider		
Design Consultants		
Contractors/Subcontractor		
Manufacturer's Representatives		

RADIANT FLOOR HEATING SYSTEM

Start-up

FRANCOIS CLAUZADE | CINDY GIBSON | architects
211-161 Stafford Street
Winnipeg MB R3M 2W9
t.204.474.2574 t.204.453.5042

REVISION #: _____

NAME:		CUSTOMER:	SMI - CSC
COMPANY:		PROJECT:	C-17 Stores Freezer Replacement
ADDRESS:		FILE NUMBER:	R.086718.001
		DATE:	DD / MM / YYYY

MANUFACTURER'S START-UP CHECKLIST COMPLETE

START-UP CHECKLIST & PROCEDURES SUBMITTED TO DEPARTMENTAL REPRESENTATIVE

PRESSURE TESTING OF TUBING BEFORE OVERPOUR IS INSTALLED

PRESSURE TESTING DURING OVERPOUR INSTALLATION

CONFIRM OVERPOUR IS CURED BEFORE PROCEEDING

FILLING SYSTEM & AIR PURGING

FiILLING SYSTEM

PURGING AIR FROM SYSTEM

BALANCING OF MANIFOLD LOOPS

GENERAL COMMENTS:

POSITION/TITLE	SIGNATURE	DATE
Building Owner/Representative		
Building Operations and Maintenance Staff		
Cx Authority/ Commissioning Provider		
Design Consultants		
Contractors/Subcontractor		
Manufacturer's Representatives		

PLUMBING FIXTURE

Functional Performance Testing

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t.204.474.2574 t.204.453.5042

REVISION #: _____

NAME:	Cindy Gibson	CUSTOMER:	SMI - CSC
COMPANY:	Francois Clauzade - Cindy Gibson - Architects	PROJECT:	C-17 Stores Freezer Replacement
ADDRESS:	211-161 Stafford Street	FILE NUMBER:	R.086718.001
	Winnipeg, MB - Manitoba R3M 2W9	DATE:	DD / MM / YYYY

SHEET INTENTIONALLY LEFT BLANK FOR INDIVIDUAL TO POPULATE AS NEEDED

NEW TEMPERED WATER FOR EXISTING SAFETY STATION (EYE/FACE WASH & SHOWER COMBINATION UNIT):

TEST TEMPERATURE TO REQUIREMENTS (60C)

TEST FLOW

GENERAL COMMENTS:

POSITION/TITLE	SIGNATURE	DATE