PART 1 GENERAL

1.1 SECTION INCLUDES

.1 Title and description of Work.

.2 Contractor use of premises.

.3 Owner occupancy.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises of the supply, installation, testing and commissioning of five (5) draw-out type circuit breakers as per this specification and drawings. All new circuit breakers are to be supplied and installed by this Contractor in existing switchgear. Supply and installation of a new circuit breakers remote control station for the five (5) new circuit breakers. Also any new conduit and wiring required including cutting and patching of walls, ceilings etc, and the replacement back to original conditions will be by this contractor.

.2 Replacement of existing circuit breakers with new circuit breaker also known as RIR (Roll-In-Replacement) which shall be fully compatible with the existing switchgear cubicles, with identical primary and secondary connections. Circuit breakers shall be draw-out using modular element with electronic trip units.

.3 A portable floor-supported, roller-based, elevating lift truck for moving circuit breakers in and out of compartments as well as outside the switchgear.

.4 CSA recertification of the existing switchgear if modifications are required to the existing switchgear to accommodate the new circuit breakers.

.5 All existing circuit breakers shall be turned over to the Owner, or disposed of as directed by the Owner.

1.3 CONTRACTOR USE OF PREMISES

.1 Contractor has restricted use of site other than restrictions indication in Section 01 14 00.

.2 Coordinate use of premises under direction of Owner's Representative.

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

.4 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.

.5 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Engineer/Architect.

1.4 OWNER OCCUPANCY

.1 Owner will occupy premises during entire construction period for execution of normal operations.

.2 Cooperate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

.3 No interruption to the normal services of the health centre will be allowed under any circumstances without the permission of the owner. It is understood that interruptions to the electrical normal power will be required to perform the switchovers, but such outages shall be coordinated with the owner well ahead of time, and shall be as short as possible.

.4 The installation of new circuit breakers shall be performed during weekend to minimize disruption to the facility. All work shall be completed prior to start of normal operations (Monday at 6:00 am).

1.5 ON-SITE DOCUMENTS

.1 Maintain at job site documents as indicated in Section 01 31 00 – Project Management and Coordination.

1.6 SITE VISIT

.1 A site visit can be arranged to view the area of the work at the bidder's request.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

.1 Connecting to existing services.

.2 Special scheduling requirements.

1.2 RELATED SECTIONS

.1 Section 01 32 00 – Construction Progress Documentation.

.2 Section 01 56 00 - Temporary Barriers and Enclosures.

.3 Section 01 35 30 – Infection Control.

.4 Owner Policies as referenced herein.

1.3 EXISTING SERVICES

.1 No interruption of the health centre's utilities or services will be allowed if it affects normal operations.

.2 Where interruption of services are necessary and will not affect the operations of the hospital, notify owner and Engineer/Architect of intended interruption of services and obtain required permission.

.3 Where Work involves breaking into or connecting to existing services, give owner and Engineer/Architect 72 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends.

1.4 SCHEDULE OF WORK

.1 Schedule all demolition, cutting and altering existing work, drilling and power activated hammering outside of normal operating office and health care service hours of 8:30 a.m. to 5:00 p.m. daily, Monday through Friday.

.2 Schedule all work in co-ordination with Hospital/LTC facility staff.

.3 Prepare work schedules and submit to the Owner for approval.

1.5 USE OF AND ACCESS TO SITE

.1 Contractor's use of site is generally restricted as follows:

.1 Storage of materials, set up of Contractor owned or leased plant, equipment, trailers, vehicles and the like is to be confined to sites and locations as designated by the Owner within the property boundaries of Health Centre.

.2 All employees of the Prime Contractor and those of his Sub-contractors and suppliers are to enter and exit the site using the shortest distance route available. In all cases, the Contractor is to carry out all work in accordance with Section 01 35 30 – Infection Control.

.3 Parking for vehicles owned or leased by the Contractor's employees and his sub-contractor's employees is to be designated by the Owner and limited to the number of parking spaces which the Owner sets from time to time.

.2 The Contractor is to maintain security and separation barriers around the work areas.

.3 The Contractor is to ensure that all barriers are in compliance with Occupational Health and Safety Acts and Regulations, Infection Control, Owner Policies and Security requirements specified in other sections of the Contract Documents.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

.1 Section includes administrative and procedural requirements for substitutions.

1.3 RELATED SECTIONS

.1 Section 01 61 00 – Common Product Requirements.

1.4 DEFINITIONS

.1 Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by General Contractor.

.2 Substitutions for Cause: Changes proposed by General Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.

.3 Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to General Contractor or Owner. No substitutions for convenience are permitted.

1.5 ACTION SUBMITTALS

.1 Substitution Requests: Submit one (1) copy of each request, in PDF format, for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section Number and Title, and Drawing Numbers and Titles.

.1 Substitution Request Form: Use form provided at the end of this section.

.2 Documentation: Show compliance with requirements for substitutions and the following, as applicable:

.1 Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.

.2 Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.

.3 Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

.4 Product Data, including drawings and descriptions of products and fabrication and installation procedures.

.5 Samples, where applicable or requested.

.6 Certificates and qualification data, where applicable or requested.

.7 List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.

.8 Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.

.9 Detailed comparison of General Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.

.10 Cost information, including a proposal of change, if any, in the Contract Sum.

.11 General Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.

.12 General Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

.3 Owner's Representative Action: If necessary, Owner's Representative will request additional information or documentation for evaluation within five (5) working days of receipt of a request for substitution. Owner's Representative will notify General Contractor of acceptance or rejection of proposed substitution within ten (10) working days of receipt of request, or five (5) working days of receipt of additional information or documentation, whichever is later.

.1 Forms of Acceptance: Change Order, Construction Change Order, or Owner's Representative Supplemental Instructions for minor changes in the Work.

.2 Use product specified if Owner's Representative does not issue a decision on use of a proposed substitution within time allocated.

1.6 QUALITY ASSURANCE

.1 Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.7 PROCEDURES

.1 Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 PRODUCTS

2.1 SUBSTITUTIONS

.1 Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than fifteen (15) days prior to the time required for preparation and review of related submittals.

.1 Conditions: Owner's representative will consider General Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Owner's Representative will return requests without action, except to record noncompliance with these requirements:

.1 Requested substitution is consistent with the Contract Documents and will produce indicated results.

.2 Requested substitution provides sustainable design characteristics that specified product provided.

.3 Substitution request is fully documented and properly submitted.

.4 Requested substitution will not adversely affect General Contractor's construction schedule.

.5 Requested substitution has received necessary approvals of authorities having jurisdiction.

.6 Requested substitution is compatible with other portions of the Work.

.7 Requested substitution has been coordinated with other portions of the Work.

.8 Requested substitution provides specified warranty.

.9 If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

.2 Substitutions for Convenience: Not permitted.

PART 3 PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION

Newfoundland Labrador

Equal or Substitute Product Request Form

Request Phase Pre-Tender □ Post Tender □
(If Pre-tender only) Current Tender Due Date: _____ Request No.: _____ Dated: _____
Project No.: _____ Contract No.: _____
Project Name/Location: _____

References: Specification(s): Section(s): _____ Paragraph(s):_____
Drawing(s): Drawing(s) No.(s):_____ Detail(s) No.(s):_____

Contractually Specified Product: _____
Contractor Proposed Product: _____

Proposed Product is: Equal: □ Substitute: □

*See attached data for **both** specified and proposed products as required by Section 01 61 00.*

Data attached: Drawings: □ Product Data: □ Reports: □ Samples: □
Tests: □ Other: _____

Reason(s) for not providing the Specified Product:

Similar Installation:
Project: Architect:
Address: Owner:
Date Installed:

Post-Tender:

Will proposed substitution impact other parts of the Work? No □ Yes □ *If yes attach explanation by*
Will proposed substitution increase Contract Time? No □ Yes □ *number of Days.* _____

Actual Dollar Savings if substitution is accepted: $_____

The undersigned Certifies that the proposed Request for an Equal or Substitute conforms to all of the requirements of Division 01 General Requirements, Section 01 25 00 Substitution Procedures.

Request Submitted By General Contractor: _____
(Firm's Name)

By: _____ _____ _____ _____
(Print Name) *(Title)* *(Signature)* *(Date)*

Owner's Representative Review – This Substitution Request is: Request Received on (Date): _____

□ **Approved:** *(Submittals in accordance with Div. 01 General Requirements, Section 01 33 00 Submittal Procedures.)*
□ **Approved as Noted:** *(Submittals in accordance with Div. 01 General Requirements, Section 01 33 00 Submittal Procedures.)*
□ **Rejected:** **Use Specified Materials.**
□ **Rejected:** **Request Not Received Within Specified Time Period – Use Specified Materials.**

Reviewed issue By: _____ _____ _____
(Print Name) *(Signature)* *(Date)*

PART 1 GENERAL

1.1 SECTION INCLUDES

.1 Coordination work with other contractors and subcontractors under administration of Engineer/Architect.

.2 Scheduled project meetings.

1.2 RELATED SECTIONS

.1 Section 01 11 00 - Summary of Work.

.2 Section 01 91 13 – General Commissioning (Cx) Requirements.

1.3 DESCRIPTION

.1 Coordination of progress schedules, submittals, use of site, temporary utilities, construction facilities, and construction Work, with progress of Work of other contractors and subcontractors under instructions of Owner's Representative and/or Engineer/Architect.

1.4 PROJECT MEETINGS

.1 Project meetings to be held at times and locations as determined by Owner's Representative and/or Engineer/Architect.

.2 Engineer/Architect will arrange project meetings and record and distribute minutes.

1.5 CONSTRUCTION ORGANIZATION AND START-UP

.1 Within 10 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Establish time and location of meetings and notify parties concerned minimum 5 days before meeting.

.3 Agenda to include following:

.1 Appointment of official representative of participants in Work.

.2 Schedule of Work, progress scheduling in accordance with Section 01 32 00 - Construction Progress Documentation.

.3 Schedule of submission of shop drawings, samples, colour chips in accordance with Section 01 33 00 - Submittal Procedures.

.4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 51 00 - Temporary Utilities.

.5 Delivery schedule of specified equipment in accordance with Section 01 32 00 - Construction Progress Documentation.

.6 Site security in accordance with Section 01 52 00 - Construction Facilities.

.7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, and administrative requirements.

.8 Record drawings in accordance with Section 01 78 00 - Closeout Submittals.

.9 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.

.10 Take-over procedures, acceptance, and warranties in accordance with Section 01 77 00 - Closeout Procedures and 01 78 00 - Closeout Submittals.

.11 Monthly progress claims, administrative procedures, photographs, and holdbacks.

.12 Appointment of inspection and testing agencies or firms in accordance with Section 01 45 00 - Quality Control.

.13 Insurances and transcript of policies.

.4 Comply with Engineer/Architect's allocation of mobilization areas of site; for field offices and sheds, for access, traffic, and parking facilities.

.5 During construction coordinate use of site and facilities through Engineer/Architect's procedures for intra-project communications: Submittals, reports and records, schedules, coordination of drawings, recommendations, and resolution of ambiguities and conflicts.

.6 Comply with instructions of Engineer/Architect for use of temporary utilities and construction facilities.

1.6 ON-SITE DOCUMENTS

.1 Maintain at job site, one copy each of the following:

.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 Field test reports.

.9 Copy of approved Work schedule.

.10 Health and Safety Plan and other Safety related documents.

.11 Manufacturers' installation and application instructions.

.12 Labour conditions and wage schedules.

.13 Other documents as specified.

1.7 SCHEDULES

.1 Submit preliminary construction progress schedule in accordance with Section 01 32 00 - Construction Progress Documents to Engineer/Architect coordinated with Engineer/Architect's project schedule. Schedule to show anticipated progress stages and final completion of work within time period required by contract documents.

.2 After review, revise and resubmit schedule to comply with project schedule requirements.

.3 During progress of Work revise and resubmit at project progress meetings or as directed by Engineer/Architect.

1.8 SUBMITTALS

.1 Make submittal to Engineer/Architect for review.

.2 Submit preliminary shop drawings, product data and samples in accordance with Section 01 33 00 – Submittal Procedures for review for compliance with Contract Documents; for field dimensions and clearances, for relation to available space, and for relation to Work of other contracts. After review, revise and resubmit for transmittal to Engineer/Architect.

.3 Submit requests for payment for review to Engineer/Architect.

.4 Submit requests for interpretation of Contract Documents, and obtain instructions through Engineer/Architect.

.5 Process change orders through Engineer/Architect.

.6 Deliver closeout submittals for review by Engineer/Architect.

1.9 COORDINATION DRAWINGS

.1 Provide information required by Engineer/Architect for preparation of coordination drawings.

.2 Review and approve revised drawings for submittal to Engineer/Architect.

.3 Engineer/Architect may furnish additional drawings for clarification. These additional drawings have same meaning and intent as if they were included with plans referred to in contract documents.

1.10 CLOSEOUT PROCEDURES

.1 Notify Engineer/Architect when Work is considered ready for Substantial Performance.

.2 Accompany Engineer/Architect on preliminary inspection to determine items listed for completion or correction.

.3 Comply with Engineer/Architect's instructions for correction of items of Work listed in executed certificate of Substantial Performance and for access to Owner-occupied areas.

.4 Notify Engineer/Architect of instructions of items of Work determined in Engineer/Architect's final inspection.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 01 77 00 - Closeout Procedures.

1.2 SCHEDULES REQUIRED

.1 Submit schedules as follows:

- .1 Construction Progress Schedule.
- .2 Submittal Schedule for Shop Drawings and Product Data.
- .3 Submittal Schedule for Samples.
- .4 Product Delivery Schedule.
- .5 Shutdown or closure activity.

1.3 FORMAT

.1 Prepare schedule in form of a horizontal bar chart.

.2 Provide a separate bar for each major item of work, trade or operation.

.3 Split horizontally for projected and actual performance.

.4 Provide horizontal time scale identifying first work day of each week.

.5 Format for listings: chronological order of start of each item of work.

.6 Identification of listings: By Systems description.

1.4 SUBMISSION

.1 Submit initial format of schedules within 15 working days after award of Contract.

.2 Submit schedules in electronic format, forward on disc as PDF files.

.3 Submit one opaque reproduction, plus 2 copies to be retained by Engineer/Architect.

.4 Engineer/Architect will review schedule and return review copy within 10 days after receipt.

.5 Resubmit finalized schedule within 7 days after return of review copy.

.6 Submit revised progress schedule with each application for payment.

.7 Distribute copies of revised schedule to:

- .1 Job site office.
- .2 Subcontractors.
- .3 Other concerned parties.

.8 Instruct recipients to report to Contractor within 10 days, any problems anticipated by timetable shown in schedule.

1.5 CRITICAL PATH SCHEDULING

.1 Include complete sequence of construction activities.

.2 Include dates for commencement and completion of each major element of construction as follows.

.1 Equipment Installations.

.2 Finishes.

.3 Show projected percentage of completion of each item as of first day of month.

.4 Indicate progress of each activity to date of submission schedule.

.5 Show changes occurring since previous submission of schedule:

.1 Major changes in scope.

.2 Activities modified since previous submission.

.3 Revised projections of progress and completion.

.4 Other identifiable changes.

.6 Provide a narrative report to define:

.1 Problem areas, anticipated delays, and impact on schedule.

.2 Corrective action recommended and its effect.

.3 Effect of changes on schedules of other prime contractors.

1.6 SUBMITTALS SCHEDULE

.1 Include schedule for submitting shop drawings, product data, and samples.

.2 Indicate dates for submitting, review time, resubmission time, last date for meeting fabrication schedule.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

PART 1 GENERAL

1.1 SECTIONS INCLUDE

.1 Shop drawings and product data.

.2 Samples.

.3 Certificates and transcripts.

1.2 RELATED SECTIONS

.1 Section 01 32 00 – Construction Progress Documentation.

.2 Section 01 45 00 – Quality Control

.3 Section 01 78 00 – Closeout Submittals

1.3 ADMINISTRATIVE

.1 This section specifies general requirements and procedures for contractor's submissions of shop drawings, product data, samples and mock-ups to Engineer/Architect for review. Submit promptly and in orderly sequence to not cause delay in Work. Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with work until relevant submissions are reviewed by Engineer/Architect.

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

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

.5 Review submittals prior to submission to Engineer/Architect. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified by contractor as to specific project will be returned without being examined and shall be considered rejected.

.6 Notify Engineer/Architect, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

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

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Engineer/Architect's review of submittals.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Engineer/Architect review of submission, unless Engineer/Architect gives written acceptance of specific deviations.

.10 Make any changes in submissions which Engineer/Architect may require consistent with Contract Documents and resubmit as directed by Engineer/Architect. When resubmitting, notify Engineer/Architect in writing of revisions other than those requested.

.11 Notify Engineer/Architect, in writing, when resubmitting, of any revisions other than those requested by Engineer/Architect.

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

1.4 SUBMITTALS

.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 Coordinate each submission with requirements of work and Contract Documents. Individual submissions will not be reviewed until all related information is available.

.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 10 days for Engineer's/Architect’s review of each submission.

.5 Adjustments made on shop drawings by Engineer/Architect are not intended to change contract price. If adjustments affect value of Work, state such in writing to Engineer/Architect immediately after receipt of approval of shop drawings. If value of work is to change a change order must be issued prior to proceeding with work.

.6 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.

.7 Submissions shall include:

- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .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 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.

.8 After Engineer/Architect review, distribute copies.

.9 Submit 3 prints plus one electronic copy in PDF format of shop drawings for each requirement requested in specification Sections and as Engineer/Architect may reasonably request.

.10 Submit electronic copy in PDF format of product data sheets or brochures for requirements requested in Specification Sections and as requested by Engineer/Architect where shop drawings will not be prepared due to standardized manufacture of product.

.11 Delete information not applicable to project.

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

.13 Cross-reference product data information to applicable portions of Contract Documents.

.14 If upon review by Engineer/Architect, 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.

.15 Samples: examples of materials, equipment, quality, finishes, workmanship. Label samples with origin and intended use.

.16 Notify Engineer/Architect in writing, at time of submission of deviations in samples from requirements of contract documents.

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

.18 Adjustments made on samples by Engineer/Architect are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Engineer/Architect prior to proceeding with Work.

.19 Make changes in samples, which Engineer/Architect may require, consistent with Contract Documents.

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

1.5 PROGRESS PHOTOGRAPHS

.1 Progress photograph to be electronically formatted and labelled as to location and view.

1.6 SHOP DRAWINGS REVIEW

.1 The review of shop drawings by Engineer/Architect is for the sole purpose of ascertaining conformance with the general concept. This review shall not mean that Engineer/Architect approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or of responsibility for meeting all requirements of the construction and contract documents. Without restricting the generality of the foregoing, the Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains slowly to fabrication processes or to techniques of construction and installation and for co-ordination of the work of all sub-trades.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

PART 1 GENERAL

1.1 REFERENCES

.1 Code and standards referenced in this section refer to the latest edition thereof.

.2 Canadian Standards Association (CSA)

.1 CSA S269.1 Falsework for Construction Purposes.

.2 CAN/CSA-Z259.1 Safety Belts and Lanyards.

.3 CAN/CSA-Z259.10 Full body Harnesses.

.4 CAN/CSA-Z259.11 Shock Absorbers for Personal Fall Arrest Systems.

.5 CAN/CSA-Z259.2, Fall Arresting Devices, Personnel Lowering Devices and Lifelines.

.6 FCC No. 301 Standard for Construction Operations.

.3 Newfoundland Occupational Health and Safety Act, Amended

.4 Consolidated Newfoundland and Regulations 1149 WMIS Regulations Under the Occupational Health and Safety Act

.5 Consolidated Newfoundland and Regulations 1165 Occupational Health and Safety Regulations under the Occupational Health and Safety Act.

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

.7 National Building Code of Canada.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 35 43 - Environmental Procedures

.3 Section 01 41 00 - Regulatory Requirements

.4 Section 02 82 00.02 - Asbestos Abatement

1.3 SUBMITTALS

.1 At least 10 (ten) working days prior to commencing any site work: submit to Engineer/Architect copies of:

.1 A complete Health and Safety Risk Assessment and Management Plan.

.2 Acceptance of the Project Health and Safety Risk Assessment and Management Plan and other submitted documents by the Engineer/Architect shall only be viewed as acknowledgement that the contractor has submitted the required documentation under this specification section.

.3 Engineer/Architect makes no representation and provides no warranty for the accuracy, completeness and legislative compliance of the Project Health and Safety Risk Management Plan and other submitted documents by this acceptance.

.4 Responsibility for errors and omissions in the Project Health and Safety risk Assessment and Management Plan and other submitted documents is not relieved by acceptance by Engineer/Architect.

1.4 OCCUPATIONAL HEALTH AND SAFETY (PROJECT HEALTH AND SAFETY RISK ASSESSMENT AND MANAGEMENT PLANS)

.1 Conduct operations in accordance with latest edition of the Newfoundland Occupational Health and Safety (OH&S) Act and Regulations.

.2 Prepare a detailed Project Health and Safety Risk Assessment and Management Plan for the Owner. Assessment shall identify, evaluate and control job specific hazards and the necessary control measures to be implemented for managing hazards.

.3 Provide a copy of the Project Health and Safety Risk Assessment and Management Plan upon request to Occupational Health and Safety Branch, Department of Labour, Province of Newfoundland and Labrador and the Owner.

.4 The written Health and Safety Risk Assessment and Management Plan shall incorporate the following:

.1 A site-specific health and safety plan, refer to clause 1.5 Site-Specific Health and Safety Risk Assessment and Management Plan of this section for requirements.

.2 An organizational structure which shall establish the specific chain of command and specify the overall responsibilities of contractors employees at the work site.

.3 A comprehensive workplan which shall:

.1 define work tasks and objectives of site activities/operations and the logistics and resources required to reach these tasks and objectives

.2 establish personnel requirements for implementing the plan, and

.3 establish site specific training and notification requirements and schedules.

.4 A personal protected equipment (PPE) Program which shall detail PPE:

.1 Selection criteria based on site hazards.

.2 Use, maintenance, inspection and storage requirements and procedures.

.3 Decontamination and disposal procedures.

.4 Inspection procedures prior to during and after use, and other appropriate medical considerations.

.5 Limitations during temperature extremes, heat stress and other appropriate medical consideration.

.5 An emergency response procedure, refer to Clause 1.6 Supervision and Emergency Response Procedure of this section fro requirements.

.6 A hazard communication program for informing workers, visitors and individuals outside of the work area as required.

.7 A diving program which shall contain standard operating procedures to be followed in the diving operation.

.8 A health and safety training program.

.9 General safety rules.

.5 Periodically review and modify as required each component of the Project Health and Safety Risk Assessment and Management Plan when a new hazard is identified during completion of work and when an error or omission is identified in any part of the Project Health and Safety Risk Assessment and Management Plan.

.6 Implement all requirements of the Project Health and Safety Risk Assessment and Management Plan.

.1 Ensure that every person entering the project site is informed of requirements under the Project Health and Safety Risk Assessment and Management Plan.

.2 Take all necessary measures to immediately implement any engineering controls, administrative contacts, personal protective equipment required or termination of work procedures to ensure compliance with the Project Health and Safety Risk Assessment and Management Plan.

1.5 SITE SPECIFIC HEALTH AND SAFETY PLAN

.1 Prepare a detailed site Specific Project Health and Safety Plan which shall:

.1 Contain certain hazard assessment results.

.2 Identify engineering and administrative demonstrative controls (work-practices and procedures) to be implemented for managing identified and potential hazards, and comply with applicable federal and provincial legislation and more stringent requirements that have been specified in these specifications.

.2 Review for completeness the hazard assessment results immediately prior to commencing work, when a new hazard is identified during completion of work and when an error or omission is identified.

.1 Be solely responsible for investigating, evaluation and managing any report of actual or potential hazards.

.2 Retain copies of all completed hazard assessments at the project site and make available to the Engineer/Architect immediately upon request.

1.6 SUPERVISION AND EMERGENCY RESCUE PROCEDURE

.1 Carry out work under the direct supervision of competent persons responsible for safety by ensuring the work complies with the appropriate section of OH&S Act and Regulations

.2 Assign a sufficient number of supervisory personnel to the work site.

.3 Provide a suitable means of communications for workers required to work alone.

.4 Develop an emergency rescue plan for the job site and ensure that supervisors and workers are trained in the emergency rescue plan.

.5 The emergency response plan shall address, as a minimum:

.1 Pre-emergency planning.

.2 Personnel roles, lines of authority and communication.

.3 Emergency recognition and prevention.

.4 Safe distances and places of refuge.

.5 Site security and control

.6 Evacuation routes and procedures

.7 Decontamination procedures which are not covered by the site specific safety and health plan.

.8 Emergency medical treatment and first aid.

.9 Emergency alarm, notification and response procedures including procedures for reporting incidents to local, provincial and federal government departments.

.10 PPE and emergency equipment.

.11 Procedures for handling emergency incidents.

.12 Site specific emergency response training requirements and schedules.

.6 The emergency response procedures shall be rehearsed regularly as part of the overall training program.

.7 Provide adequate first aid facilities for the jobsite and ensure that a minimum number of workers are trained in first aid in accordance with the First Aid Regulations.

1.7 CONTRACTORS SAFETY OFFICER

.1 The contractor's Safety Officer will be solely responsible for the implementation and monitoring of the Project Health and Safety Risk Assessment and Management Plan, and will have the authority to implement health and safety changes as directed by the Engineer/Architect. The Safety Officer shall have as a minimum:

.1 Completed training in hazardous occurrence management and response/protocols.

.2 Completed training in the use, maintenance of fall protection systems.

.3 Completed training in the design and construction of scaffolding.

.4 Completed training in confined space entry protocols and techniques.

.5 Completed training in First Aid.

.6 Have working knowledge of occupational safety and health regulations.

.7 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.

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

.9 Prior to mobilization on-site, the Contractor's Safety Officer shall hold an orientation meeting (in conjunction with Owner's Representative) with the construction team to review project occupational health and safety. Include a review of:

.1 Health and Safety Risk Assessment and Management Plan.

.2 Construction Safety Measures.

.3 Supervision and Emergency Rescue Procedures.

.10 Report directly to and be under direction of site supervisor.

1.8 HEALTH AND SAFETY COMMITTEE

.1 Establish an Occupational Health and Safety Committee where ten or more workers are employed on the job site as per the OH&S Act and Regulations.

.2 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.

.3 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.

1.9 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.

1.10 UNFORSEEN HAZARDS

.1 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction. Advise Engineer/Architect verbally and in writing.

1.11 INSTRUCTION AND TRAINING

.1 Workers shall not participate in or supervise any activity on the work site until they have been trained to a level required by this job function and responsibility. Training shall as a minimum thoroughly cover the following:

.1 Federal and Provincial Health and Safety Legislation requirements including roles and responsibilities of workers and person(s) responsible for implementing, monitoring and enforcing health and safety requirements.

.2 Safety and health hazards associated with working on a contaminated site including recognition of symptoms and signs which might indicate over exposure to hazards.

.3 Limitations, use, maintenance and disinfection-decontamination of personal protective equipment associated with completing work.

.4 Limitations, use, maintenance and care of engineering controls and equipment.

.5 Limitations and use of emergency notifications and response equipment including emergency response protocol.

.6 Work practices and procedures to minimize the risk of an accident and hazardous occurrence from exposure to a hazard.

.2 Provide and maintain training of workers, as required, by Federal and Provincial legislation.

.3 Provide copies of all training certificates to Engineer/Architect for review, before a worker is to enter the work site.

.4 Authorized visitors shall not access the work site until they have been:

.1 Notified of the names of persons responsible for implementing, monitoring and enforcing the health and Safety Risk Assessment and Management Plan.

.2 Briefed on safety and health hazards present on the site.

.3 Instructed in the proper use and limitations of personal protective equipment.

.4 Briefed as the emergency response protocol including notification and evacuation process.

.5 Informed of practices and procedures to minimize risks from hazards and applicable to activities performed by visitors.

1.12 CONSTRUCTION SAFETY MEASURES

.1 Observe construction safety measures of National Building Code, latest edition, Provincial Government, OH&S Act and Regulations, Workplace Health and Safety and Compensation Commission and Municipal Authority provided that in any case of conflict or discrepancy more stringent requirements shall apply.

.2 Administer the project in a manner that will ensure, at all times, full compliance with Federal and Provincial Acts, regulations and applicable safety codes and the site Health and Safety Risk Assessment and Management Plan.

.3 Provide Engineer/Architect with copies of all orders, directions and any other documentation, issued by the Provincial Department of Government Services, Occupational Health and Safety branch immediately after receipt.

1.13 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 and authority having jurisdiction, and in consultation with Engineer/Architect.

1.14 HEALTH AND SAFETY MONITORING

.1 Periodic inspections of the contractor’s work may be carried out by the Engineer/Architect to maintain compliance with the Health and Safety Program. Inspections will include visual inspections as well as testing and sampling as required.

.2 The contractor shall be responsible for any and all costs associated with delays as a result of contractor’s failure to comply with the requirements outlined in this section.

1.15 NOTIFICATION

.1 For projects exceeding thirty (30) days or more, the contractor shall, prior to the commencement of work, notify in writing the Work Place Health and Safety Division, Department of Labour with the following information:

.1 Name and location of construction site.

.2 Company name and mailing address of contractor doing the work.

.3 The number of workers to be employed.

.4 A copy of the Health and Safety Risk Assessment and Management Plan if requested.

1.16 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Engineer/Architect.

.2 Provide Engineer/Architect with written report of action taken to correct non-compliance of health and safety issues identified.

.3 Engineer/Architect may stop work if non-compliance of health and safety regulations is not corrected.

1.17 WHMIS

.1 Ensure that all controlled products are in accordance with the Workplace Hazardous Materials Information System (WHMIS) Regulations and Chemical Substances of the OH&S Act and Regulations regarding use, handling, labelling, storage, and disposal of hazardous materials.

.2 Deliver copies of relevant Material Safety Data Sheets (MSDS) to job site and the Engineer/Architect. The MSDS must be acceptable to Labour Canada and Health and Welfare Canada for all controlled products that will be used in the performance of this work.

.3 Train workers required to use or work in close proximity to controlled products as per OH&S Act and Regulations.

.4 Label controlled products at jobsite as per OH&S and Regulations.

.5 Provide appropriate emergency facilities as specified in the MSDS where workers might be exposed to contact with chemicals, e.g. eye-wash facilities, emergency shower.

.1 Workers to be trained in use of such emergency equipment.

.6 Contractor shall provide appropriate personal protective equipment as specified in the MSDS where workers are required to use controlled products.

.1 Properly fit workers for personal protective equipment

.2 Train workers in care, use and maintenance of personal protective equipment.

.7 No controlled products are to be brought on-site without prior approved MSDS.

.8 The MSDS are to remain on site at all times.

1.18 OVERLOADING

.1 Ensure no part of work or associated equipment is subjected to loading that will endanger its safety or will cause permanent deformation.

1.19 FALSEWORK

.1 Design and construct falsework in accordance with CSA S269.1.

1.20 SCAFFOLDING

.1 Design, erect and maintain scaffolding in accordance with CSA S269.2 and Sections 91-97 of the OH&S Act and Regulations.

.2 Ensure that fall-restraint or fall-arrest devices are used by all workers working at elevations greater than 3.05 metres above grade or floor level in accordance with CSA Z259.

1.21 PERSONAL PROTECTIVE EQUIPMENT

.1 Ensure workers on the jobsite use personal protective equipment appropriate to the hazards identified in the Risk Assessment and Management Plan and those workers are trained in the proper care, use, and maintenance of such equipment.

.2 PPE selections shall be based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the site, task-specific conditions, duration and hazards and potential hazards identified on site.

.3 Provide workers and visitors to the site with proper respiratory protection equipment.

.1 No work shall be performed in an area where an airborne contaminant exceeds one half (½) the IDLH concentration.

.2 Respiratory protection shall be provided in accordance with the requirements of the Occupational Health and Safety Branch, Department of Labour of the Province of Newfoundland and Labrador and these specifications.

.3 Establish, implement and maintain a respirator inspection and maintenance program.

.4 Copies of all respirator owners maintenance manuals, shall be kept at all times at the contractor's site office.

.4 Provide and maintain a supply of dermal protection equipment to allow visitors and all workers proper dermal protection.

.1 Dermal protection shall be sufficient to act as a protective barrier between the skin and an airborne contaminant or hazardous material. Dermal protection shall also be provided for all physical hazards.

.2 Dermal protection equipment shall not be used after exceeding 75% of the break through time. The break through time shall be based on the contaminant which requires the least amount of time to break through the protective equipment

.3 Copies of all dermal protection user specifications, owners and maintenance manuals shall be kept at all times at the contractor's site office.

.4 Establish, implement and maintain air inspection program to ensure proper dermal protection in accordance with CSA, NIOSH, U.S. EPA and manufacturer's requirements.

.5 Provide all workers and up to five (5) visitors to the site with proper hearing protection. Workers and visitors shall not be exposed to noise levels greater than 85 dB (A) over an eight hour shift without proper hearing protection.

.6 Provide all workers and up to five (5) visitors to the site with CSA approved eye protection sufficient to act as a protective barrier between the eye and airborne contaminants, hazardous materials and physical hazard.

.7 Provide workers and up to five (5) visitors to the site with CSA approved hard hats.

1.22 CONFINED SPACE WORK

.1 Comply with requirements of Canada Occupational Safety and Health Regulations, Part XI and Consolidated Regulations Newfoundland and Labrador (CRNL) OH&S 1165/96.

.2 Provide approved air monitoring equipment where workers are working in confined spaces and ensure any test equipment to be used is calibrated, in good working order and used by trained persons.

.3 Develop a confined space entry program specific to the nature of work performed and in accordance with OH&S Act and Regulations and ensure supervisors and workers are trained in the confined space entry program.

.1 Ensure that personal protective equipment and emergency rescue equipment appropriate to the nature of the work being performed is provided and used.

.4 Provide and maintain training of workers, as required by the Federal and Provincial Legislation.

.5 Provide Engineer/Architect with a copy of an “Entry Permit” for each entry into the confined space to ensure compliance with Federal and Provincial Legislation.

1.23 HAZARDOUS MATERIALS

.1 Should material resembling hazardous materials (asbestos/mould) be encountered during the execution of work and notify Engineer/Architect. Do not proceed until written instructions have been received from Engineer/Architect.

.2 Unless otherwise noted, for hazardous materials abatement and repair, employ the services of a recognized Environmental Consultant to provide all air monitoring and testing services for regulatory requirements.

1.24 WORK STOPPAGE

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

PART 2 PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 PART 3 EXECUTION (NOT APPLICABLE

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

.1 Section 01 56 00 – Temporary Barriers and Enclosures

.2 Section 01 35 99 – Dust Control

1.2 REFERENCES

.1 Sample Site-Specific Outline Infection Prevention and Control Plan – appended to this Section.

.1 To be used for reference only

.2 An example of the level of detail and formatting required of the Contractor's Infection Control Plan.

.2 ASTM International (ASTM)

.1 ASTM C 645-13, Standard Specification for Nonstructural Steel Framing Members

.2 ASTM C1396/C1396M-14, Specification for Gypsum Board

.3 Canadian Standards Association (CSA)

.1 CSA Z317.13 – latest version, Infection Control During Construction Renovation and Maintenance of Health Care Facilities.

.1 For the purposes of this Section, the term "Standard" shall be synonymous with CSA Z317.13.

.2 The Standard references several other standards within – reference to the Standard also confers reference to those standards referenced within

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.33-M89, Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction

.5 American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE)

.1 ASHRAE 52.2-2007, Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size.

.2 ASHRAE 62-2007, Ventilation for Acceptance of Indoor Air Quality

1.3 INTRODUCTION

.1 This section is an outline of the procedures to follow when using the CSA Z317.13 standard.

.1 These procedures must be maintained for the duration of the project.

.2 This specification shall be used as a guiding document for interpretation and application of the CSA standard.

.3 All proposed variations to the specifications or the Standard are to be reviewed and approved by the Owner, Contractor, Architect and Consultants before implementation.

.4 All individuals involved in construction within healthcare facilities are directly involved in helping people to get well.

.5 Excessive dust or work on water systems, which may have no ill effect on a healthy individual, could readily endanger a patient's life. Therefore, it is necessary to implement protective measures and create barriers between patients and the dust and contaminants created / disturbed during construction, renovation and maintenance of healthcare facilities.

.2 Indoor air quality problems may arise as a result of construction or renovation projects that take place in or around occupied spaces. Examples often include:

.1 Improper isolation of construction areas from adjacent occupied spaces

.2 Damaged or open sections of ventilation systems

.3 Construction materials left in or near occupied spaces

.4 Poor housekeeping during the project

.5 Indiscriminate use and poor ventilation of solvents, paints, adhesives, etc.

.6 Improper removal and disposal of existing materials

.7 Improper handling of (new and existing) hazardous materials

.3 Special precautions must be taken to prevent construction dust and vapours from entering either the ventilation system and/or from migrating to adjacent occupied rooms and corridors.

.4 There are several sources of potential contamination during a construction / renovation project including but not limited to:

.1 Demolition Activities - Demolition activities release dust, biological contaminants, and fibrous materials into the air.

.1 Insulation in ceilings and walls, wall coverings, and ceiling tile all have a high fibre content which may produce substantial airborne fibrous materials during demolition.

.2 Total suspended particulate levels may be very high with a significant portion of the total being of the respirable particle sizes.

.2 Construction - Construction introduces additional dust and fibrous materials. Many construction materials used today emit a range of volatile organic compounds, VOC's especially formaldehyde. Glues, vapours, and gases rise from solvents used to prepare surfaces for bonding. Emissions from welding and soldering can introduce a range of gasses and metals into the air.

.5 Finish Work and Materials - Final finishing and decorating of renovated spaces can introduce strong odours and more VOCs. Solvents, paints and varnishes, adhesives and glues all add to the accumulation of these irritating compounds.

1.4 SCOPE

.1 Contractors planning to submit a tender for this project shall familiarize themselves with the Latest version of CSA Z317.13 Standard before submitting their bid and before construction work begins. All Sub-Contractors and people under their control shall strictly enforce the appropriate procedures therein.

.2 It is the responsibility of each Contractor and Subcontractor to ensure that the Work of their Contract is carried out in a manner that is consistent with the latest version of "CSA Z317.13-*Infection Control During Construction, Renovation and Maintenance of Health Care Facilities*" (hereafter referred to as "the Standard") so as to minimize the risk to indoor air quality problems and occupant safety.

.3 The Contractor's Site Superintendent must have successfully completed both 1-day CSA training courses, "Fundamentals of Infection Control During Construction, Renovation and Maintenance of Health Care Facilities" and "*Effective Implementation of Infection Control During the Construction, Renovation and Maintenance in Health Care Facilities.*"

.1 Submit proof of completion with bid.

.4 The Contractor is responsible to provide the physical facilities, monitoring and overall management for the Infection Control Procedures associated with the Work of this project.

.5 The Infection Control requirements of this Section may overlap with or duplicate measures required elsewhere. Coordinate with the following Sections for installation and removal of Infection Control Enclosures, Negative Air Systems and Testing / Monitoring.

.6 The information contained in this Section and the Standard shall be supplemented and clarified by a Site/Project specific Infection Control Plan to be produced by the Contractor.

.1 A sample Infection Control Plan (IC Plan) is attached to this Section for information. This sample IC Plan outlines the format and level of detail expected of the project-specific IC Plan to be produced by the Contractor.

.7 The Owner may, at its discretion, engage a third party infection control specialist for the purpose of interpreting the application of the Standard to the project and monitoring the implementation of the Standard.

.8 The Contractor shall make available throughout the duration of the project a copy of the Standard for viewing at the Contractor's site office for review by all Trades and project team members.

1.5 SUBMITTALS

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

.2 Provide MSDS sheets where applicable.

.3 Infection Control Plan (IC Plan).

.1 Adhere to requirements and incorporate all documentation as outlined in this Section, the Latest Version of the Standard and Capital Health Infection Prevention and Control Manual.

.2 Draft IC Plan: Submit for review at the time of receipt of Supplementary Information. For recommended format and expected level of detail, refer to the attached Sample Site Specific Outline Infection Prevention and Control Plan. Draft IC Plan to incorporate the requirements of this Section, and contain the following:

.1 Project description and statement of infection control measures and procedures.

.2 Intended sequence of major construction activities.

.3 Travel pathways.

.4 Selection and description of all temporary controls implemented on the project site.

.5 Description of the timing, sequencing and frequency that measures will be implemented.

.6 Description of the type and frequency of maintenance activities required for the chosen control methods.

.7 Monitoring systems to be used, reporting frequencies and to whom reports will be circulated.

.8 Communication structure – e.g. Who is notified of pressure loss and to whom corrective action reports get sent? Who is authorized to stop work on Site?

.9 Testing protocol to be used for all equipment, including: prior to start, daily, weekly, monthly and annual checks.

.10 Education and awareness plan to ensure every worker is adequately informed of the IC Plan and its impact on their work.

.3 Final IC Plan: Allow ten working days for Project Multi-Disciplinary Team (MDT) review of Draft IC Plan. Architect will return Draft IC Plan with comments. Revise IC Plan to incorporate review comments. Once the Architect has accepted the infection control measures and strategies, the Contractor to submit, within five calendar days a Final IC Plan

1.6 INFECTION CONTROL CONSTRUCTION PERMIT

.1 To assist the multidisplinary team involved with the renovation activities to identify the patient population at risk and the preventive measures that must be initiated, an Infection Control Construction Permit has been developed. The contractor

will not be permitted to commence construction in any area of the building until the construction permit for the applicable area is completed and approved by the Engineer.

.2 The Infection Control Construction Permit describes four types of construction activities that may occur within a health care facility. In addition, the permit list four risk groups ranging from lowest to highest risk. The project planning committee has assigned the Infection Control Risk Group based on their close proximity or exposure to the construction zone. By using the Construction Activity Infection Control Matrix, appropriate infection preventive measures are identified by matching the construction activity with the risk group. The drawings outline the risk group number assigned to each area of construction.

.3 The Infection Control Construction Permit lists the preventive measures under two categories: construction/renovation activities and plumbing activities. The preventive measures are then further subdivided into categories that represent the personnel involved with the project.

.4 Instructions on How to Complete:

.1 The Infection Control Construction Permit must be completed during the planning phase of the construction/renovation project by the contractor and the multidisciplinary planning committee. An **Infection Control Practitioner (ICP)** will be assigned by the Owner and will be involved in each phase of the project to ensure that the appropriate prevention measures are initiated and followed. The type of "Construction Activity" is first identified by selecting the level of activity that best describes the project that is being planned for that area of the building. The types of construction activity are described in Part A. The second step (Part B) involves identifying the "Population Risk Group" that may be affected by the project because of their physical proximity or exposure to the construction renovation activity. There are four risk groups described in Part B that identify the risk group. The appropriate infection prevention measures are identified by matching the construction activity with the population risk group in Part C

1.7 INFECTION CONTROL CONSTRUCTION PERMIT

.1 The following is the inspection control construction permit and attachments which will be used on this project:

Infection Control Permit:					
Location of Construction:			Project Start Date:		Estimated Duration:
Project Manager (PM):			Contractor:		Infection Control Practitioner (ICP):
PM's Phone Number:			Contractor's phone number:		ICP's phone number:
Yes	No	Construction Activity (see Part A)	Yes	No	Population Risk Group (see Part B)
		Type A: Inspection, non-invasive activities			Group 1: Lowest Risk
		Type B: Small scale, short duration, minimal dust generating activities			Group 2: Medium Risk
		Type C: Activities that generate moderate to high levels of dust, requires greater than one work shift to complete			Group 3: Medium to High Risk
		Type D: Activities that generate high levels of dust, major demolition and construction activities requiring consecutive work shifts to complete			Group 4: Highest Risk
Comments:					

Note: Refer to floor plan for location of construction.

.2 Infection Control Construction Permit

.1 Part A: Types of Construction Activity

Type A	Inspection and Non-invasive Activities: These include, but are not limited to, activities that require removal of ceiling tiles for visual inspection (limited to 1 tile per 50 square feet), painting(but not sanding), wall covering, electrical trim work, minor plumbing (disrupts water supply to a localized patient care area (e.g. 1 room) for less than 15 minutes), and other maintenance activities which do not generate dust or require cutting of walls or ceilings or access to ceilings other than for visual inspection.
Type B	Small scale, short duration activities which create minimal dust. These include, but are not limited to, activities that require access to chase spaces, cutting of walls or ceilings where dust migration can be controlled for the installation/repairs of minor electrical work, ventilation components, telephone wires or computer cables, and sanding of walls for painting or wall covering to only repair small patches. It also includes plumbing that requires disruption to the water supply of more than one patient care area (e.g. > 2 rooms) for less than 30 minutes.
Type C	Any work which generates a moderate to high level of dust or requires demolition or removal of any fixed building components or assemblies (e.g. counter tops, cupboards, sinks). These include, but are not limited to, activities that require sanding of walls for painting or wall covering, removal of floor coverings, ceiling tiles and casework, new wall construction, minor duct work or electrical work above ceilings, major cabling activities, and any activity which cannot be completed within a single work shift. It also includes plumbing that requires disruption to the water supply of more than one patient care area (e.g. > 2 rooms) for more than 30 minutes but less than 1 hour.
Type D	Major demolition and construction projects. These include, but are not limited to, activities that require heavy demolition or removal of a complete cabling system and new construction which require consecutive work shifts to complete. It also includes plumbing that requires disruption to the water supply of more than one patient care area (e.g. > 2 rooms) for more than 1 hour.

.2 Part B: Population Risks Groups

Group 1 Lowest Risk	Group 2 Medium Risk	Group 3 Medium to High Risk	Group 4 Highest Risk
• Office Areas	. All other patient care areas (e.g. Cardiac Rehab, Ambulatory Care Clinics unless stated in Group 3 or 4) . Outpatient clinics (except for oncology and surgery) . Admission/Discharge units	. Emergency Room . Radiology/MRI . Post Anesthesia Care Unit . Labour and Delivery . Newborn Nurseries . Day Surgery . Renal Patients . Nuclear Medicine . Physiotherapy tank areas . Echocardiography . Pump team . Laboratories (specimens) . General Med/Surg. . Pediatrics . Geriatrics . Long-term care	. All ICU's . All OR's . Sterile Processing Rooms . Oncology units (including outpatients) . Transplant Units (including outpatients) . Dialysis Units . Labour & Delivery Operating Rooms . All Cardiac Catherization & Angiography areas . Cardiovascular/ Cardiology patients . Transplant patients . Anesthesia and Pump areas . All Endoscopy areas . Pharmacy Admixture Rooms

.3 Part C: Construction Activity and Population Risk Group Matrix

.1 A copy of the Infection Control Construction Permit must be sent to the Infection Prevention and Control Department.

	Construction Activity			
Population Risk Group	**Type A**	**Type B**	**Type C**	**Type D**
Group 1	I	II	II	III/IV
Group 2	I	II	III	IV
Group 3	I	III	III/IV	IV
Group 4	II	III/IV	III/IV	IV

.4 Part D: Actions for Infection Control Preventive Measures

Class I Date:	Contractor a) Construction/Renovation Activities • Execute work by methods to minimize raising dust from construction/renovation activities • Immediately replace tiles displaced for visual inspection • Schedule water interruptions during low activity (e.g. evenings if at all possible) b) Plumbing Activities • Flush water lines prior to reuse • Observe for discoloured water • Ensure water temperature meets the standards set by the health care facility • Ensure gaskets and items made of materials that support the growth of Legionella are not being used • Ensure faucet aerators are not installed or used • Assess for discoloured water	Housekeeping a) Construction/Renovation Activities • Wet mop and vacuum area as needed and when work is completed b) Plumbing Activities • Report discoloured water to maintenance and ICP Infection Control Practitioner a) Construction/Renovation Activities • Educate construction workers on health risks that are involved with the project and rationale for the infection control preventive measures • Ensure preventive measures are being followed b) Plumbing Activities • Assess for discoloured water Medical/Nursing Staff a) Construction/Renovation Activities • Minimize patients exposure to construction/ renovation area b) Plumbing Activities • Report discoloured water to maintenance and ICP •
Initials:		

Class II Date: Initials:	Contractor a) Construction/Renovation Activities • Provide active means to prevent dust from dispensing into the atmosphere o place dust mat at entrance and exit of work areas o use drop sheets to control dust o control dust by water misting work surfaces while cutting o seal unused doors with duct tape o block off seal air vents in construction/renovation area o disable the ventilation system in the construction/renovation area o contain debris in sealed, covered containers or cover with a moisten sheet before transporting to be disposed o monitor need to change and/or clean filters in construction/renovation area b) Plumbing Activities • Same as above in Class I • Collection tanks and long pipes that allow water to stagnate should be avoided • Consider hyperchlorinating or superheating stagnant potable water (especially if Legionella is already present in hospital potable water supply)	Housekeeping a) Construction/Renovation Activities • Wet mop and vacuum with a HEPA filtered vacuum as needed and when activity is completed • Wipe work surfaces with a disinfectant b) Plumbing Activities • same as above in Class I Infection Control Practitioner a) Construction/Renovation Activities • Same as above in Class I • Identify high risk patients who may need to be moved away from the construction zone • Designate a traffic pattern for construction workers that does not go near the patients • Consider temporarily moving high risk patients who are in or adjacent to the construction area b) Plumbing Activities • Same as above in Class I • Consider hyperchlorinating or superheating stagnant potable water (especially if Legionella is already present in hospital potable water supply Medical/Nursing Staff a) Construction/Renovation Activities • Same as above in Class I • Identify high risk patients who may need to be temporarily moved away from the construction zone b) Plumbing Activities • Same as above in Class I

Class III Date: Initials:	Contractor a) Construction/Renovation Activ • Same as above in Class I and II • Ensure ICP has been consulted • Ensure windows, doors, intake and exhaust vents are properly sealed with plastic and duct tape within the construction/renovation area • Erect an impermeable dust barrier from ceiling (includes area above false ceilings) to the floor • Maintain negative pressure within construction zone by using portable HEPA equipped air filtration units • Do not remove dust barrier until the project is completed and the area has been cleaned thoroughly • Remove debris as described above and cover transport receptacles or carts • Remove dust barrier carefully to minimize spreading dust and other debris particles associated with the construction project • Ensure ventilation system in functioning properly after construction or renovation projects is completed b) Plumbing Activities • Same as above in Class I and II • Flush water lines at construction or renovation site and adjacent patient care areas before patients are readmitted	Housekeeping a) Construction/Renovation Activities • Same as above in Class I and II • Vacuum work area with HEPA filtered vacuums • Wet mop the area and wipe all horizontal areas with disinfectant • Ensure construction zone is thoroughly cleaned when work is completed • Increase frequency of cleaning in areas adjacent to the construction zone while the project is underway b) Plumbing Activities • Same as above in Class I and II Infection Control Practitioner a) Construction/Renovation Activities • Same as above in Class I and II b) Plumbing Activities • Same as above in Class I and II Medical/Nursing Staff a) Construction/Renovation Activities • Same as above in Class I and II • Ensure area is thoroughly cleaned before patients are readmitted to the area b) Plumbing Activities • Same as above in Class I and II

Class IV Date: Initials:	Contractor a) Construction/Renovation Activities • Same as above in Class I, II & III • Erect an impermeable dust barrier consisting of 2 layers of 6 mil polyethylene that also has an anteroom before starting the construction project • Place a walk-off mat in patient care areas near the construction zone and outside the anteroom to trap dust from the workers' shoes, equipment and debris • Construction workers must enter and leave the construction zone through the anteroom so they can be vacuumed using a HEPA filtered vacuum cleaner before leaving the work site or they could wear cloth or paper coveralls that are removed each time they leave the work site • All personnel entering the construction zone are required to wear shoe covers • The construction workers must change the shoe covers each time they leave the work site • Ensure negative pressure is maintained within the anteroom and construction zone • Vacuum work area with HEPA filter vacuum cleaner daily or more often if needed • Ensure ventilation systems are working properly in adjacent areas • Review ventilation system requirements in the construction area with ICP to ensure system is appropriate and is functioning properly • Review infection control measures with other members of the planning team to evaluate their effectiveness and identify problems at the end of construction project b) Plumbing Activities • Same as above Class I, II & III • Hyperchlorinate or superheat stagnant potable water (especially if Legionella is already present in hospital water supply	Housekeeping a) Construction/Renovation Activities • Wet mop and vacuum area as needed and when work is completed b) Plumbing Activities • Report discoloured water to maintenance and ICP Infection Control Practitioner a) Construction/Renovation Activities • Educate construction workers on health risks that are involved with the project and rationale for the infection control preventive measures • Ensure preventive measures are being followed b) Plumbing Activities • Assess for discoloured water Medical/Nursing Staff a) Construction/Renovation Activities • Minimize patients exposure to construction/ renovation area b) Plumbing Activities • Report discoloured water to maintenance and ICP

PART 2 PRODUCTS

2.1 MATERIALS

.1 Provide all materials required for implementation of Preventive Measures outlined in the Standard as they apply to this project.

.2 Provide all Personal Protection Equipment (PPE) required by the Standard for everyone entering the Work site. This includes Contractors, trades, inspectors, Owner's representatives and Consultants.

.3 PORTABLE AIR FILTRATION AND ISOLATION CONTROL EQUIPMENT - SCRUBBER

.1 Where air from the construction zone cannot be ventilated outside or when the construction zone is accessible by building occupants, provide portable air filtration equipment to filter air prior to recirculation.

.2 Scrubber: provide air scrubber equipment to the requirements below and operate during all stages of work. Ensure filters are changed as recommended by the equipment manufacturer.

.1 Multiple-stage filtration as follows:

.1 First stage – coarse particulate prefilter.

.2 Second stage – pleated prefilter.

.3 Third stage – carbon filter for odours.

.4 Final stage – 99.97% HEPA filter. Filters shall be performance leak tested in conformance with the Standard.

.5 Minimum peak airflow of 1800 cfm.

.4 TEMPORARY DOORS AND FRAMES

.1 Doors: Temporary-use only, to remain property of Contractor; solid, insulated or honeycomb core door, wood or steel construction, flush type. Re-used doors to be in condition acceptable to Architect.

.1 Size: Minimum 810 mm wide x 2030 mm high, unless larger required for execution of Work.

.2 Hardware Requirements:

.1 Locksets: Provide locking hardware to maintain security of area of Work.

.2 Closers: For interior use, adjustable closing force.

.3 Weatherstripping: WH listed head and jamb seal, frame-mount extruded aluminum and sponge neoprene.

.4 Door Bottoms Sweeps: WH listed brush sweep, door-mount extruded aluminum and nylon brush insert.

.2 Frames: Temporary-use only, to remain property of Contractor; steel construction, rabbeted, reinforced for anchorage to wall framing, complete with hinges. Re-used frames to be in condition acceptable to Architect.

.3 Alternate Pre-Assembled Entrance System: Temporary-use only, to remain property of Contractor; insulated core steel entrance door pre-hung in wood or PVC frame. Provide hardware and minimum door size as indicated for standard door.

.4 Finish: Painted finish in colour selected by Consultant. Re-used doors and frames to be in condition acceptable to Architect.

.5 TEMPORARY PARTITIONS

.1 All temporary partitions to be full height and go to u/s of slab above ceilings.

.1 Framing: Steel studs and tracks to ASTM C645; galvanized sheet steel, minimum 25 gauge x 90 mm depth, C-shape.

.2 Gypsum Board: ASTM C1396/C1396M, 13 mm thickness, maximum available length in place; ends square cut, tapered edges.

.3 Sheeting: to CAN/CGSB-51.33M, translucent polyethylene film, 6 mil thick. Provide compatible sealing tape.

.2 Where existing conditions do not permit installation of hard hoardings to u/s of slab above, alternate measures may be entertained if they can be shown to meet the intent of the Standard. Acceptance of such alternate solutions shall be at the discretion of the Project Multi-Disciplinary Team.

PART 3 EXECUTION

3.1 GENERAL

.1 Become familiar with and implement infection prevention and control measures, specified access routes, waste disposal routes and procedures, as required by the Standard and per Capital Health Infection Prevention and Control Manual.

.2 Coordinate infection control measures and procedures with the Owner's Project Manager (or delegate) and Infection Control personnel.

.3 Implement, maintain, monitor and enforce Project Specific infection control preventive measures and indoor air quality precaution procedures, as outlined in the Standard and per Capital Health Infection Prevention and Control Manual.

.4 Attend regularly scheduled meetings of the Project Multi-Disciplinary Team (Project MDT).

3.2 GENERAL RESPONSIBILITIES

.1 Implement **Level III/IV** preventative measures in accordance with CSA Z317.13 as modified by this Section and attached appendices.

.2 Attend a pre-construction meeting of the Project MDT to establish clear lines of communication and clarify expectations.

.3 Attend and conduct training and ensure that all personnel working on the project site, including those of all subcontractors have full understanding of their roles, responsibilities and preventative measure requirements and procedures.

.4 Ensure that all demolition and construction activities by Subcontractors are reviewed and approved by the Contractor prior to the start of work and periodically throughout the duration of the project.

.5 General Responsibilities include, but are not limited to:

.1 Materials for temporary works and permanent installation shall be protected from exposure to dust and moisture during construction.

.2 Ensure that an inspection and verification program is in effect with regard to the shipping, handling, and receiving of materials susceptible to moisture damage and dust build-up before such materials are accepted and used.

.3 Supply, erect, and maintain the integrity of barriers between the construction area and adjacent areas of the health care facility.

.4 Provide negative air pressure to prevent the spread of dust, particulate and odours from the construction area.

.5 Disable and seal off the main building ventilation system within the renovation areas for the duration of the demolition and reconstruction work.

.6 Maintain the construction site ventilation system (separate from building ventilation system).

.7 Keep contaminant generation at the construction site within acceptable limits.

.8 Be responsible for housekeeping at the construction site.

.9 Be responsible for the actions of employees and subtrades.

.10 Be responsible for the physical security of the construction zone.

.11 Ensure that materials are kept clean and dry during delivery and installation.

.12 Stop Work when infection control measures are not adequate. Do not re-commence Work until problems have been corrected and deemed acceptable by Owner’s Infection Control personnel.

.13 Comply with infection prevention requirements as described in Owner's Infection Control procedure.

3.3 GENERAL PROCEDURES

.1 Dedicate one path of travel and points of exit for movement to and from the site. Coordinate with Architect. Provide temporary exit signs for egress, and other temporary fire and life safety measures, as required by the local Authorities Having Jurisdiction.

.2 Seal off all unused windows, doors and air intake into the construction zone with plastic sheeting and tape.

.3 Post signs on doors indicating that there is absolutely no entrance or exit through the sealed-off areas except for fire or security reasons.

.4 At all door exits, install walk-off mats, min. 36" x 48". Replace at regular intervals to maintain effectiveness or when less than 25% of the active layer remains functional.

.5 All debris is to be removed from the construction site in tightly closed containers. Debris container exteriors shall be cleaned prior to exiting the work site.

.6 Create and maintain a negative pressure differential between the construction zones and adjacent areas of the facility.

.7 Vacuum the construction area daily with a HEPA filter–equipped vacuum cleaner.

.8 Dust and other soil outside the construction area that has been left behind by people who were in the construction area are to be promptly cleaned.

.9 Establish an orderly system for retrieving construction equipment and supplies to minimize the number of trips into and out of the construction area.

3.4 INFECTION CONTROL PLAN IMPLEMENTATION

.1 Designate an on-site party (or parties) responsible for instructing workers and overseeing and documenting results of the IC Plan for the Project.

.2 Provide control measures identified by the IC Plan.

.3 Construct control measures in accordance with CSA Z317.13 and as described by this Section.

.4 Ensure that all access shall be from outside the occupied areas of the health care facility, or construct anterooms at access points to the construction area if access is from within the health care facility.

.5 Place a walk-off mat (sticky mat) outside and inside the anteroom to trap dust from equipment, debris, and the shoes of personnel leaving the construction area.

.6 Ensure that the workers:

.1 Leave the construction area through the anteroom so that they can be vacuumed with a HEPA filter–equipped vacuum cleaner before leaving; or

.2 Wear protective clothing that is to be removed each time they leave the construction area and before going into patient care areas.

.7 Repair holes in walls within 2 hrs or seal temporarily.

.8 Ensure that ventilation systems are working properly in adjacent areas.

.9 Carefully remove barrier walls and use short term protection to minimize environmental contamination during removal.

.10 Maintain control features installed under this contract. Remove only when authorized by Architect.

.11 Remove control features when directed by the Architect. Do not cause turbidity, and excessive re-suspension of particles when removing control features.

3.5 DUST CONTROL

.1 Appropriate methods shall be used to control the migration of dust particles from the construction area to other occupied areas of the health care facility as follows:

.1 Check for leakage paths between the construction area and adjacent areas of the health care facility. Wind and stack effects shall be considered, and steps shall be taken to plug holes in spatial separations (e.g., walls, partitions, floors, and floor slabs) and to seal gaps.

.2 Windows, doors, and air intake and exhaust vents in areas of the health care facility adjacent to construction areas shall be sealed, especially around buildings that are going to be demolished. Areas housing patients who are most susceptible to infections shall be sealed off from the construction area to prevent air leaks into the patient care areas.

.3 The top and bottom of plastic barriers that reach from the floor to the ceiling shall be sealed off to isolate the construction area from adjacent areas.

.2 Exhaust fans shall run after the completion of construction to remove 99.9% of airborne contaminants. Refer to ventilation requirements specified by this Section.

.3 The negative pressure differential from all adjacent occupied areas into the construction area shall be maintained at 7.5 Pa (0.03 in wc).

.1 Intermittent disruptions may occur under controlled conditions, provided that they are planned for and approved by the Consultant.

.2 The differential air pressure between the anteroom shall be less than the hospital zone but greater than the construction zone.

.3 Alarmed differential pressure gauges shall be installed on exterior of construction zone along primary control lines (e.g. hoarding). Do not locate gauges closer than 5m from the entrance. Such gauges shall be calibrated and maintained as recommended by the manufacturer of the equipment.

.4 Environmental-biological air sampling:

.1 Air sampling may be performed before construction and prior to Interim Inspection.

.2 Total particulate and fungal spore concentrations measured in the construction area prior to Interim Inspection shall be consistent with pre-construction concentrations.

.3 Sampling, if performed, will be performed at the Owner's expense.

3.6 WATER QUALITY

.1 Dead leg pipes that are created as a result of a construction project shall be removed as close to the main line as possible. The constructor shall determine what worker protection, if any, is required for removal of the dead leg pipe.

.2 Report dead leg piping identified during the course of construction or renovation work that is not created by the Work of this contract to the Consultant upon discovery.

.3 Where it is impractical to remove dead leg pipe, it shall be isolated from the live plumbing system, drained of water, and permanently capped. A tag identifying that the line has been isolated and the date of isolation shall be affixed to each end where the line has been isolated.

.4 Water lines shall be flushed of waste before reuse after new plumbing has been installed.

.5 Periodic flushing may be required during construction and again prior to occupancy to minimize the risk of water contamination and bacterial growth.

.6 Any persistent appearance of discoloured water shall be reported immediately to HCF Operations, Architect and Project MDT.

.7 Surveillance for *Legionella* or other waterborne micro-organisms may be undertaken before, during, and after construction. Such testing, if conducted, will be performed at the Owner's expense.

3.7 VENTILATION REQUIREMENTS

.1 Ventilation rates within the construction zone shall be as required to meet the air quality and aerodynamic differential pressure requirements of the Standard. Actual air changes to be determined by the Contractor.

.2 All ventilation grilles and ducts within the construction zone shall be sealed to prevent contamination until construction activities are completed.

.3 All existing and new ductwork shall be cleaned before start-up. Refer to Mechanical Sections.

3.8 SITE MAINTENANCE

.1 Place debris in covered containers or cover it with a moistened sheet before transporting it for disposal.

.2 Debris transported through occupied areas of the facility must be in sealed containers.

.3 Clean the construction area with a HEPA filter-equipped vacuum cleaner, a wet mop, or both, at the end of each shift or more frequently if needed.

.4 Place supplies and equipment in covered containers during transportation through the health care facility to prevent contamination in other areas.

.5 Debris should be removed at the end of each workday. Exposure of the occupants of the health care facility to debris shall be minimized.

.6 Dismantle dust screens where required to allow for unrestricted traffic flow during hours of peak hospital activity. Reinstate at start of next shift.

3.9 TEMPORARY CONTROL AND ISOLATION MEASURES

.1 Temporary barriers shall generally be constructed in conformance with recommendations of Annex A of the Standard.

.2 Where necessary or beneficial, other means and methods can be used for isolation of the construction zone, if the Contractor can adequately demonstrate that alternative means and methods can achieve the equivalent or better isolation and meet the intents of the Standard, with respect to containment of contaminants and protection of patients/staff in other parts of the facility.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

.1 Where building related projects involve work that could potentially disturb asbestos or lead based paints, disturbances must be carefully controlled by registered abatement contractors in accordance with the Occupational Health and Safety Regulations (OHS) and other applicable Sections in this Contract. The purpose of this procedure is to ensure that nuisance dust, not containing asbestos or lead, is controlled in an effective manner.

.2 Section includes:

.1 Ensuring any maintenance, repair, construction or renovation activity that impacts building materials or creates dust is performed in such a way as to eliminate, minimize, contain and clean up any and all dust generated by the activity. This applies to work preparation, work activities and post-work activities.

.2 This applies to, but is not limited to, the following types of dust generating activities:

.1 Disturbing gypsum board, plaster or other surfacing materials.

.2 Disturbing concrete or wood containing materials.

.3 Handing or disturbing fibrous building insulation.

.4 Generating welding fumes: in addition to the requirements of this procedure, a hot work permit is also required to be completed by the contractor and submitted to the Owner's Representative for review if hot work is required in an occupied building.

1.2 RELATED WORK

.1 Division 1 – General Requirements.

1.3 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.205, Sealer for Application to Asbestos-Fibre-Releasing Materials.

.2 Canadian Standards Association (CSA)

.1 CAN/CSA Z317.13-F07, Infection Control During Construction, Renovation and Maintenance of Health Care Facilities.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Polyethylene sheets.

.2 Wood studs for stand-alone barriers.

PART 3 EXECUTION

3.1 PRE-WORK ACTIVITIES

.1 The contractor shall ensure the following prior to commencing work:

.1 Specific dust generating activities and associated controls shall be addressed in the Site Specific Health and Safety Plan.

.2 Workforce, including sub-contractors, must be made aware of the site dust control requirements.

.3 Check the various work zones within the building and adjacent areas to confirm the area are clean.

.4 Access to all active work areas shall be restricted to authorized contractors.

.5 For occupied buildings, dust generating activities shall be performed after normal hours of operations, unless prior permission if received from the Owner's Representative.

3.2 WORK ACTIVITIES

.1 Dust producing projects shall be classified as small scale, medium scale or large scale projects, as detailed in paragraph 3.3.

.2 For all dust generating activities, Contractor is required to have Site Safety Officer present to ensure dust control procedures are properly followed.

.3 Any dust related complaints brought to the Contractors attention, must be immediately reported to Owner's Representative, and an incident investigation must be initiated to prevent reoccurrence.

.4 Where practical, dust generation should be eliminated or minimized through the use of proper engineering controls (i.e. containment at source such as drilling wall surface through a wet sponge, wet suppression, use of HEPA vacuum equipped tools, etc).

.5 Dust generating power tools shall be equipped with HEPA filtered dust collectors where practical. Power tools capable of generating dust without dust collection shall only be used in conjunction with suitable work area containment and with Owner's Representative approval.

.6 Walk-off mats shall be employed for medium and large scale dust generating projects at all worker entrances/exits. Purpose of these mats is to trap dust from equipment and shoes of personnel leaving the dust contaminated work zone. Mats shall be vacuumed daily, or more frequently as necessary, using HEPA filtered vacuums. Mats shall be of sufficient size to place both feet on mat at once.

3.3 PROJECT CLASSIFICATION

.1 Class A - Small Scale Project: (Dust producing activities disturbing less than one (1) linear meter or one (1) square meter of material. These are small scale, short duration jobs generating minimal dust.

.1 Some examples include:

.1 Installing wires or cables, sanding/repairing small section of wall, cutting out gypsum board to install receptacles.

.2 Carry out Work as follows:

.1 Remove all furniture, fixtures and belongings from the work area to a minimum of 1.5 m in all directions.

.2 Restrict access to immediate work area. Keep all doors closed where practical. Post "Dust Hazard Area – Do Not Enter" signs at all entrances to work area. In common areas use barrier tape to establish the regulated area.

.3 Place a drop cloth of polyethylene sheeting immediately underneath the work area extending a minimum of 1.5 m in each direction (unless flooring is easily cleanable).

.4 Cover all air return or exhaust vents if within 1.5 m of the work area with polyethylene sheeting and duct tape.

.5 Complete the task, minimizing dust production, as prescribed in paragraph 3.2 - Work Activities.

.6 When the work is completed, wet-wipe polyethylene sheeting and flooring and if necessary, other areas close by with a damp rag.

.7 Visually inspect the area for any remaining dust and wet wipe as necessary.

.8 If installed, remove polyethylene sheeting from air return and exhaust vents.

.9 Where practical, transport debris after hours using least congested and most direct routes. If any debris is spilled outside the work area, immediately wet-wipe debris.

.10 Clean all tools and equipment before removal from the work area.

.2 .Class B - Medium Scale Project (Dust producing activities disturbing greater than one (1) square meter and less than 30 square meters of material) with anticipated moderate dust levels that are typically one shift or more in duration.

.1 Examples include:

.1 Sanding several sheets of gypsum board.

.2 Electrical work above ceiling tiles where general debris is known above the ceiling.

.3 Removing numerous ceiling tiles in an area.

.4 New wall construction.

.2 Carry out the Work as follows:

.1 Determine the most effective way of isolating the work area from occupants (i.e. using plastic barriers or by sealing off doors).

.2 Complete all items specified under small scale projects.

.3 While performing the work, limit the dust generated by removing the materials in sections, lightly misting the material as necessary. Debris shall be bagged immediately for disposal. In addition to wet wiping, HEPA filtered vacuum systems shall be employed where practical to limit airborne dust.

.4 When the task is completed, HEPA vacuum and/or wet wipe the polyethylene sheeting.

.5 Prior to removing any temporary wall partitions from floor to ceiling or polyethylene barriers, a final inspection shall be preformed by the Site Safety Officer or designate to ensure proper clean up has been completed. This inspection shall be documented by the Contractor and made available at the request of the Owner's Representative.

.6 Establishment of containment may result in the accumulation of dust within the enclosure. As such, the need for respiratory protection and decontamination would be greater than for small scale projects (i.e. N95 half face respirator with tyvek body covering).

.3 Class C - Large Scale Projects (Dust Producing Activities disturbing greater than 30 meters of material with anticipated high dust levels and typically involves multiple work shifts.

.1 Examples include:

.1 Major demolition or construction.

.2 Extensive renovations to wall or ceiling surfaces.

.3 Generating significant amounts of concrete dust.

.2 Carry out the Work as follows:

.1 Complete all items as prescribed under the Medium Scale Projects section.

.2 If the work produces dust that cannot be limited by removal in sections or misting and the work area configuration allows, use HEPA filtered negative air units with the intake directly across from the dust generating activity. Exhaust the HEPA unit outside the building.

.3 If using a disposal cart or container to transport debris within the building, ensure the lid is tightly secured and the wheels are clean prior to exiting the work area.

.4 If local source capture is employed (i.e. HEPA filtered power tool) and no significant debris anticipated then treat as a medium scale project.

.5 Negative air units shall be left operating at the completion of cleanup, for the duration stipulated in Table 4, CAN/CSA Z317.13-F07.

.6 Windows, doors, exhaust vents and supply intakes shall be sealed off in dust generating areas. Upper seals must be employed where necessary to prevent the spread of dust into adjacent areas.

.7 The contractor must be able to show that the work zone is negatively pressurized in relation to adjacent occupied areas.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCES AND CODES

.1 Perform Work in accordance with National Building Code of Canada (NBC) including all 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: stop work immediately should materials believed to contain asbestos be encountered in during the execution of the work and notify Engineer/Architect. Do not proceed until written instructions have been received from Engineer/Architect. Perform asbestos abatement and repair in accordance with Newfoundland and Labrador Asbestos Abatement Regulations, Latest Edition.

.2 Mould: stop work immediately should material resembling mould be encountered during the execution of work and notify Engineer/Architect. Do not proceed until written instructions have been received from Engineer/Architect.

1.3 BUILDING SMOKING ENVIRONMENT

.1 Comply with smoking restrictions. There shall be no smoking on any Health centre property.

1.4 RELICS AND ANTIQUITIES

.1 Protect relics, antiquities, items of historical or scientific interest such as cornerstones and contents, commemorative plaques, inscribed tablets, and similar objects found during course of work.

.2 Give immediate notice to Engineer/Architect and await Engineer/Architect's written instructions before proceeding with work in this area.

.3 Relics, antiquities and items of historical or scientific interest remain Her Majesty's property.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

PART 1 GENERAL

1.1 SECTIONS INCLUDE

.1 Inspection and testing, administrative and enforcement requirements.

.2 Tests and mix designs.

.3 Equipment and system adjust and balance.

1.2 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 01 78 00 – Closeout Submittals

1.3 INSPECTION

.1 Allow Engineer/Architect 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 Engineer/Architect instructions.

.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 Engineer/Architect may order any 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. If such Work is found in accordance with Contract Documents, Engineer/Architect shall pay cost of examination and replacement.

1.4 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by Engineer/Architect for purpose of inspecting and/or testing portions of Work.

.2 Provide equipment required for executing inspection and testing by appointed agencies.

.3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Engineer/Architect at no cost to Engineer/Architect. Pay costs for retesting and reinspection.

1.5 ACCESS TO WORK

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

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

1.6 PROCEDURES

.1 Notify appropriate agency and Engineer/Architect in advance of requirement for tests, 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 an orderly sequence so as not to cause delay in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.7 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 Engineer/Architect as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

.3 If in opinion of Engineer/Architect it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner may deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which shall be determined by Engineer/Architect.

1.8 REPORTS

.1 Submit 3 copies of inspection and test reports to Engineer/Architect, plus electronic copies in PDF format.

.2 Provide copy to Subcontractor of work being inspected or tested, manufacturer or fabricator of material being inspected or tested.

.3 Include copy of all inspection and test reports in Commissioning Manuals.

1.9 EQUIPMENT AND SYSTEMS

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

~~.3~~.2 Electrical – Coordinate with electrical division.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 01 52 00 - Construction Facilities.

.2 Section 01 56 00 - Temporary Barriers and Enclosures.

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 TEMPORARY POWER AND LIGHT

.1 Co-ordinate with Owner for temporary power connection in the building. Contractor is responsible for installation, maintenance and removal of cables, distribution and branch panel boards, poles, lighting, heating and general power receptacles as required.

1.4 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.

1.5 SANITARY FACILITIES

.1 Permanent building facilities may be used on approval of Engineer/Owner.

1.6 TEMPORARY COMMUNICATION FACILITIES

.1 Provide and pay for temporary telephone, fax, data hook up, lines and equipment necessary for own use.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

.1 Construction aids.

.2 Office and sheds.

.3 Parking.

.4 Project identification.

1.2 RELATED SECTIONS

.1 Section 01 35 29.06 – Health and Safety Requirements

.2 Section 01 51 00 - Temporary Utilities.

.3 Section 01 56 00 - Temporary Barriers and Enclosures.

1.3 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

1.4 SCAFFOLDING

.1 Provide and maintain scaffolding in rigid, secure and safe manner.

.2 Erect scaffolding independent of walls. Remove promptly when no longer required. Refer to Section 01 35 29.06 – Health and Safety Requirements.

1.5 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 a weight or force that will endanger the Work.

1.6 CONSTRUCTION PARKING

.1 Parking will be permitted on site provided it does not disrupt performance of work.

.2 Provide and maintain adequate access to project site.

.3 Build and maintain temporary roads where indicated or directed by Engineer/Architect and provide snow removal during period of Work.

.4 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractor’s use of roads.

1.7 CONTRACTOR'S SITE OFFICES

.1 Provide office heated to 22 ^{o}C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table, computer, printer, telephone, internet connection, file cabinet and chair. Arrange for power supply from utility or via generator. Any costs associated with providing power to site office is to be carried by the contractor. Any cash allowance for utility Contributions in Aid of Construction shall not be used for connection of power to the contractor's site office.

.2 Provide a clearly marked and fully stocked first-aid case in a readily available location.

.3 Subcontractors may provide their own offices as necessary. Direct location of these offices.

1.8 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in a 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 a manner to cause least interference with work activities.

1.9 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.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

.1 Barriers.

.2 Environmental Controls.

.3 Traffic Controls.

.4 Fire Routes.

1.2 RELATED SECTIONS

.1 Section 01 51 00 – Temporary Utilities.

.2 Section 01 52 00 – Construction Facilities.

1.3 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

1.4 DUST TIGHT SCREENS

.1 Provide dust tight screens or insulated 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.

1.5 FIRE ROUTES

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

1.6 PROTECTION OF BUILDING FINISHES

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

.2 Provide necessary screens, covers, and hoardings.

.3 Confirm with Engineer/Architect locations and installation schedule 3 days prior to installation.

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

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

.1 Product quality, availability, storage, handling, protection, and transportation.

.2 Manufacturer's instructions.

.3 Quality of Work, coordination and fastenings.

1.2 RELATED SECTIONS

.1 Section 01 45 00 – Quality Control.

.2 Section 01 73 00 – Execution.

1.3 REFERENCES

.1 Within text of each specifications section, reference may be made to reference standards. Conform to these reference standards, in whole or in part as specifically requested in specifications.

.2 Conform to latest date of issue of referenced standards in effect on date of submission of Tenders, except where specific date or issue is specifically noted.

1.4 QUALITY

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

.2 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.

.3 Should any dispute arise as to quality or fitness of products, decision rests strictly with Engineer /Architect based upon requirements of Contract Documents.

.4 Within 7 (seven) days of written request by Engineer/Architect, submit following information for material and equipment proposed for supply:

.1 Name and address of manufacturer.

.2 trade name, model and catalogue number,

.3 performance, descriptive and test data,

.4 manufacturer’s installation or application instructions,

.5 evidence of arrangements to procure.

.5 Use products of one manufacturer for material and equipment of same type or classification unless otherwise specified.

.6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.5 AVAILABILITY

.1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of products are foreseeable, notify Engineer/Architect 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 Engineer/Architect at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Engineer/Architect reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.6 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 cementitious products clear of earth or concrete floors, and away from walls.

.5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

.6 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.

.7 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.

.8 Remove and replace damaged products at own expense and to satisfaction of Engineer/Architect.

.9 Touch-up damaged factory finished surfaces to Engineer/Architect satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.7 TRANSPORTATION

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

1.8 MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise indicated in specifications, 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 Engineer/Architect in writing, of conflicts between specifications and manufacturer's instructions, so that Engineer/Architect may establish course of action.

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

1.9 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 Engineer/Architect if required Work is such as to make it impractical to produce required results.

.2 Do not employ anyone unskilled in their required duties. Engineer/Architect 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 Engineer/Architect, whose decision is final.

1.10 CO-ORDINATION

.1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.

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

1.11 CONCEALMENT

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

.2 Before installation, inform Engineer/Architect if there is interference. Install as directed by Engineer/Architect.

1.12 REMEDIAL WORK

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

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

1.13 LOCATION OF FIXTURES

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

.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer’s recommendations for safety, access and maintenance.

.3 Inform Engineer/Architect of conflicting installation. Install as directed.

.4 Submit field drawings to indicate relative position of various services and equipment when required by Engineer/Architect.

1.14 FASTENINGS GENERAL

.1 Provide metal fastenings and accessories in same texture, colour and finish as base metal in which they occur. Prevent electrolytic action between dissimilar metals. Use non-corrosive fasteners, anchors and spacers for securing exterior work, unless stainless steel or other material is specifically requested in affected specification section.

.2 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood plugs are not acceptable.

.3 Conceal fasteners where indicated. Space evenly and lay out neatly.

.4 Fastenings which cause Spalding or cracking are not acceptable.

.5 Obtain Engineer/Architect's approval before using explosive actuated fastening devices. If approval is obtained comply with CSA Z166.

1.15 FASTENINGS - EQUIPMENT

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

.2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.

.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.

1.16 PROTECTION OF WORK IN PROGRESS

.1 Prevent overloading of any part of building. Do not cut, drill or sleeve any load bearing structural member, unless specifically indicated without written approval of Engineer/Architect.

1.17 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.

.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.

.3 Submit schedule to and obtain approval from Engineer/Architect for any shut-down or closure of active services or facility. Adhere to approved schedule and provide notice to affected parties.

.4 Where unknown services are encountered, immediately advise Engineer/Architect and confirm findings in writing.

.5 Remove abandoned services lines within 2m of structures. Cap or otherwise seal lines at cut-off points as directed by Engineer/Architect.

1.18 SELECTION OF MATERIAL AND EQUIPMENT

.1 Material and equipment will be specified in the tender documents, and selected by Contractor, by one or more of the following methods:

.1 Specification by reference to a relevant Standard, such as CSA, ASTM, ULC, etc., select any material or equipment that meets or exceeds the specified.

.2 Specification by reference to an accepted product evaluation publication, such as the CGSB "Qualified Products List", or CCMC Registry of Product Evaluations", - select any manufacturer's product so listed.

.3 Specification by Prescriptive or Performance specification – select any material or equipment meeting or exceeding specification.

.4 Specification by identification of one or more Manufacturer's specific product(s) as an "Acceptable Product", along with a listing of other manufacturers who may offer equivalent products – select any product so named, or select from equivalent product(s) of other listed manufacturers.

.2 "Acceptable Product" is deemed to be a complete and working commodity as described by a manufacturer's name, catalogue number, trade name, or any combination thereof, and will constitute the minimum standard of acceptance.

.3 Engineer/Architect will determine acceptability of Contractor's selection of material and equipment at time of Shop Drawing review.

.4 When material or equipment is specified by a Standard, Prescriptive or Performance specification, upon request of the Engineer/Architect, obtain from manufacturer an independent laboratory reporting, showing that material or equipment meets or exceeds the specified requirements.

1.19 SUBSTITUTION OF MATERIAL AND EQUIPMENT

.1 **Prior to Tender** closing bidders may propose addition of other manufacturer's names to those listed in the tender documents providing requests are made in writing at least 7 days prior to tender closing date or bid depository where bid depository is used. Engineer/Architect will inform all prospective bidders of decision by addendum, issued at least 5 days prior to the tender closing date.

Where no manufacturer's names are listed, the onus is on contractor to provide material and equipment to meet performance specification.

.2 **After Contract award** substitutions of material or equipment, other than as selected by Contractor from those specified, will be considered by Engineer/Architect only if:

.1 material or equipment selected from those specified are not available

.2 delivery date of material or equipment selected from those specified would unduly delay completion of the Contract; or

.3 alternative material or equipment to those specified, provided they are determined by the Engineer/Architect to be equivalent to or better that those specified, will result in a credit to the Contract amount.

.3 Requests for substitutions after Contract award must be accompanied by sufficient information in the form of shop drawings, manufacturer's literature, samples or other data

to permit proper investigation of the substitutes used. Requests must also include statements of respective costs of material or equipment originally specified and the proposed substitution.

.4 Should a proposed substitution be accepted after Contract award either in part or in whole, assume full responsibility and costs when substitution affects other work on Project. Contractor to pay for design or drawing changes required as a result of the substitution.

.5 Amounts of all credits arising from approval of substitutions after Contract award will be determined by Engineer/Architect and the Contract amount will be reduced accordingly.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

.1 Requirements and limitations for cutting and patching the Work.

1.2 RELATED SECTIONS

.1 Section 01 11 00 - Summary of Work.

.2 Section 01 33 00 - Submittal Procedures.

1.3 SUBMITTALS

.1 Submit written request in advance of cutting or alteration which affects:

.1 Structural integrity of any element of Project.

.2 Integrity of weather-exposed or moisture-resistant elements.

.3 Efficiency, maintenance, or safety of any operational element.

.4 Visual qualities of sight-exposed elements.

.5 Work of Owner or separate contractor.

.2 Include in request:

.1 Identification of Project.

.2 Location and description of affected Work.

.3 Statement on necessity for cutting or alteration.

.4 Description of proposed Work, and products to be used.

.5 Alternatives to cutting and patching.

.6 Effect on Work of Owner or separate contractor.

.7 Written permission of affected separate contractor.

.8 Date and time work will be executed.

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.

.5 Provide protection from elements for areas which may be exposed by uncovering work; maintain excavations free of water.

.6 Obtain Engineer/Architect’s approval before cutting, boring or sleeving load-bearing members.

1.5 EXECUTION

.1 Execute cutting, fitting, and patching including excavation and fill, 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 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.

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

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

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

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

.10 Fit Work to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

.11 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material in accordance with Section 07 84 00 - Firestopping, full thickness of the construction element.

.12 Refinish surfaces to match adjacent finishes: For continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit.

.13 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

.14 Make cuts with clean, true, smooth edges.

.15 Where new work connects with existing, and where existing work is altered, cut, patch and make good to match existing work.

1.6 WASTE MANAGEMENT AND DISPOSAL

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

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

PART 1 GENERAL

1.1 GENERAL

.1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

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

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

1.2 RELATED SECTION

.1 Section 01 77 00 - Closeout Procedures.

1.3 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other Contractors.

.2 Remove waste materials and debris from site at the end of each working day. 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 on-site containers for collection of waste materials and debris.

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

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

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

1.4 FINAL CLEANING

.1 Refer to General Conditions.

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

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

.4 When the Work is Totally Performed, remove surplus products, tools, construction machinery and equipment. Remove waste products and debris other than that caused by the Owner or other Contractors.

.5 Remove waste materials from the site at regularly scheduled times or dispose of as directed by the Engineer/Architect. 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 Leave the work broom clean before the inspection process commences.

.8 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.

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

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

1.5 WASTE MANAGEMENT AND DISPOSAL

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

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

.1 Procedures for systematic Waste Management Program for construction, deconstruction, demolition, and renovation projects, including:

.1 Diversion of Materials.

.2 Materials Source Separation Program (MSSP).

1.2 DEFINITIONS

.1 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.

.2 Recyclable: Ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse by others.

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

.4 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.

.5 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.

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

.7 Separate Condition: Refers to waste sorted into individual types.

.8 Source Separation: Acts of keeping different types of waste materials separate beginning from first time they became waste.

1.3 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 authorities having jurisdiction.

.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 recycling facility.

1.4 STORAGE, HANDLING AND PROTECTION

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

.2 Protect, stockpile, store and catalogue salvaged items.

.3 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to approved local 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 Department having jurisdiction.

.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.

1.5 DISPOSAL OF WASTES

.1 Do not bury rubbish or waste materials.

.2 Do not dispose of any waste into waterways, storm, or sanitary sewers.

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

1.6 USE OF SITE AND FACILITIES

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

.2 Provide security measures approved by Engineer/Architect.

1.7 SCHEDULING

.1 Coordinate Work with other activities at site to ensure timely and orderly progress of Work.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 APPLICATION

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

3.2 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.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 01 74 11 - Cleaning.

.2 Section 01 78 00 - Closeout Submittals.

.3 Section 01 91 13 – General Commissioning (Cx) Requirements.

1.2 FINAL INSPECTION AND DECLARATION PROCEDURES

.1 Contractor's Inspection: The Contractor and all Subcontractors shall conduct an inspection of Work, identify deficiencies and defects; repair as required. Notify the Engineer/Architect in writing of satisfactory completion of the Contractor's Inspection and that corrections have been made. Request an Engineer/Architect's Consultant's Inspection.

.2 Engineer/Architect's Inspection: Engineer/Architect and the Contractor will perform an inspection of the Work to identify obvious defects or deficiencies. The contractor shall correct Work accordingly.

.3 Completion: submit written certificate that the following have been performed:

.1 Work has been completed and inspected for compliance with Contract Documents.

.2 Defects have been corrected and deficiencies have been completed.

.3 Equipment and systems have been tested, adjusted and balanced and are fully operational.

.4 Certificates required by Fire Commissioner, Utility companies have been submitted.

.5 Operation of systems have been demonstrated to Owner's personnel.

.6 Work is complete and ready for Final Inspection.

.4 Final Inspection: When items noted above are completed, request final inspection of Work by the Engineer/Architect, representative of Central Health and the Contractor. If Work is deemed incomplete by the Engineer/Architect, complete outstanding items and request a reinspection.

.5 Declaration of Substantial Performance: When the Engineer/Architect considers deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, make application for Certificate of Substantial Performance. Refer to General Conditions for specifics to application.

.6 Commencement of Lien and Warranty Periods: The date of Owner acceptance of the submitted declaration of Substantial Performance shall be the date for commencement for the warranty period and commencement of the lien period.

.7 Declaration of Total Performance: When the Engineer/Architect considers final deficiencies and defects have been corrected and it appears requirements of the Contract have been totally performed, make application for certificate of Total Performance. Refer

to General Conditions for specifics to application. If Work is deemed incomplete by the Consultant, complete the outstanding items and request a reinspection.

1.3 REINSPECTION

.1 Should status of work require reinspection by Engineer/Architect due to failure of work to comply with Contractor's claims for inspection, Owner will deduct amount of compensation for reinspection services from payment to Contractor.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

.1 As-built, samples, and specifications.

.2 Equipment and systems.

.3 Product data, materials and finishes, and related information.

.4 Operation and maintenance data.

.5 Spare parts, special tools and maintenance materials.

.6 Warranties and bonds.

1.2 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures.

.2 Section 01 45 00- Quality Control.

.3 Section 01 71 00 – Examination and Preparation.

.4 Section 01 77 00 - Closeout Procedures.

.5 Section 01 91 13 – General Commissioning (Cx) Requirements.

1.3 SUBMISSION

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

.2 Submit one copy of completed volumes in final form 15 days prior to final inspection.

.3 Copy will be returned after final inspection, with Engineer/Architect's comments.

.4 Revise content of documents as required prior to final submittal.

.5 Two weeks prior to Substantial Performance of the Work, submit to the Engineer/Architect, two final copies of operating and maintenance manuals.

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

.7 If requested, furnish evidence as to type, source and quality of products provided.

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

.9 Pay costs of transportation.

1.4 FORMAT

.1 Organize data in the form of an instructional manual.

.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.

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

.4 Cover: Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.5 Arrange content under Section numbers and sequence of Table of Contents.

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

.7 Text: Manufacturer's printed data, or typewritten data.

.8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

.9 Provide CAD files in DWG format on CD. Also provide electronic files in PDF format.

1.5 CONTENTS - EACH VOLUME

.1 Table of Contents: provide title of project; names, addresses, and telephone numbers of Consultant and Contractor with name of responsible parties; schedule of products and systems, indexed to content of volume.

.2 For each product or system:

.1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.3 Product Data: mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

.6 Training: Refer to Section 01 91 13 – General Commissioning (Cx) Requirements.

1.6 AS-BUILTS AND SAMPLES

.1 In addition to requirements in General Conditions, maintain at the site for Engineer/Architect one record copy of:

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Change Orders and other modifications to the 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. 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. Label each document "PROJECT RECORD" in neat, large, printed letters.

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

.5 Keep record documents and samples available for inspection by Engineer/Architect.

1.7 RECORDING ACTUAL SITE CONDITIONS

.1 Record information on set of blue line opaque drawings, provided by Engineer/Architect.

.2 Provide felt tip marking pens, maintaining red color pens for recording information.

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

.4 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:

.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: legibly 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: submit manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

.7 At completion of project provide all recorded information on print drawings or alternatively transfer to CAD files in DWG format. Submit DWG files, also with electronic files in PDF format as part of the Closeout Submittals..

1.8 EQUIPMENT AND SYSTEMS

.1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. 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: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

.5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.6 Provide servicing and lubrication schedule, and list of lubricants required.

.7 Include manufacturer's printed operation and maintenance instructions.

.8 Include sequence of operation by controls manufacturer.

.9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.10 Provide installed control diagrams.

.11 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.12 Additional requirements: As specified in individual specification sections.

1.9 MATERIALS AND FINISHES

.1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations. 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.

1.10 SPARE PARTS

.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 location as directed; place and store.

.4 Receive and catalogue all items. Submit inventory listing to Engineer/Architect. Include approved listings in Maintenance Manual.

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

1.11 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 location as directed; place and store.

.4 Receive and catalogue all items. Submit inventory listing to Engineer/Architect. Include approved listings in Maintenance Manual.

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

1.12 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 project site place and store.

.4 Receive and catalogue all items. Submit inventory listing to Engineer/Architect. Include approved listings in Maintenance Manual.

1.13 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 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 and to satisfaction of Engineer/Architect.

1.14 WARRANTIES AND BONDS

.1 Develop warranty management plan to contain information relevant to Warranties.

.2 Submit warranty management plan to Engineer/Architect’s approval.

.3 Warranty management plan to include required actions and documents to assure that Owner 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 Assemble approved information in binder and submit upon acceptance of work. 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 and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work.

.4 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial Performance is determined.

.5 Verify that documents are in proper form, contain full information, and are notarized.

.6 Co-execute submittals when required.

.7 Retain warranties and bonds until time specified for submittal.

.6 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 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.

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

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

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

.8 Written verification will follow oral instructions. Failure to respond will be cause for the Engineer/Architect to proceed with action against Contractor.

1.15 PRE-WARRANTY CONFERENCE

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

.2 Engineer/Architect will establish communication procedures for:

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

1.16 WARRANTY TAGS

.1 Tag, at time of installation, each warranted item. Provide durable, oil and water resistant tag approved by Engineer/Architect.

.2 Leave date of acceptance until project is accepted for occupancy.

.3 Indicate following information on tag:

- .1 Type of product/material.
- .2 Model number.
- .3 Serial number.
- .4 Contract number.
- .5 Warranty period.
- .6 Inspector's signature.
- .7 Construction Contractor.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

.1 Section Includes

.1 General requirements relating to commissioning of project's components and systems, specifying general requirements for Installation Verification and Performance Verification of components, equipment, sub-systems, systems, and integrated systems.

.2 Acronyms

.1 CxA – Commissioning Authority.

.2 Cx – Commissioning.

.3 EMCS – Energy Monitoring and Control Systems.

.4 O&M – Operation and Maintenance.

.5 PV – Performance Verification.

.6 TAB – Testing, Adjusting and Balancing.

.7 GC – General Contractor

.8 TSI – Technical Services Inspector

1.2 COMMISSIONING INTENT

.1 Undertake Cx to bring the facility to a fully operational state and free of deficiencies in the most effective and timely manner available, ensuring the design intent is met by all systems.

.2 Cx incorporates inspection and quality assurance activities as construction progresses, including start up, installation verification, performance verification, fine tuning, and operator training.

.3 Bear all costs associated with the required personnel and test equipment as outlined in specification sections and Cx Manual and all costs with organizing and managing the activities of the applicable subtrades as identified in this section.

.4 Fully document all tests and inspections performed during the construction, at start up, installation verification and performance verification and fine tuning. Incorporate into final commissioning documentation.

.5 Provide direct training to designated staff responsible for the operation and maintenance of the building equipment and systems.

1.3 RELATED SECTIONS

.1 Section 01 45 00 - Quality Control.

.2 Section 01 77 00 - Closeout Procedures.

.3 Section 01 78 00 - Closeout Submittals.

.4 Section 01 91 33 - Commissioning (Cx) Forms.

.5 Section 01 91 41 - Commissioning (Cx) Training.

.6 Division 26 - Electrical.

.7 Division 27 - Communications.

1.4 COMMISSIONING OVERVIEW

.1 Cx is a planned program of tests, procedures and checks carried out systematically on systems and integrated systems of the finished project.

.2 Cx is an intensive quality assurance process that begins at the beginning of the project and continues through to the first year of use. The process focuses upon verifying and documenting that the system and assemblies are planned, designed, installed, tested, operated, and maintained to meet the Owners Project Requirements.

.3 Cx activities supplement field quality and testing procedures described in relevant technical sections.

.4 Cx identifies issues in Planning and Design stages which are addressed during Construction and Cx stages to ensure the built facility is constructed and proven to operate satisfactorily under weather, environmental and occupancy conditions to meet functional and operational requirements. Cx activities include transfer of critical knowledge to facility operational personnel.

.5 Complete inspection and verification activities as required by the specifications and Cx Manual as construction progresses. This includes those activities that are necessary to ensure that the project is substantially complete to permit the execution of the commissioning process for the project.

.6 Contractor to submit sample commissioning sheets to CxA for review and approval prior to beginning work.

.7 Take responsibility to:

.1 Submit and review the Cx manual.

.2 Complete all items as identified in the Cx manual. This includes work by subcontractors, test agencies, equipment representatives and manufacturer agents.

.3 Review Contract Documents and inspect the Work to ensure completeness of the Work and compliance with the Contract Documents.

.4 Correct deficiencies resulting from installation and performance verifications.

.5 Test, adjust and balance equipment and systems identified in Divisions 2-44.

.6 Submit the completed manual and project record documents as specified.

.8 **The Substantial Completion Certificate will not be issued until the commissioning process is completed and the final reports and commissioning documentation are received.**

.9 The Cx Manual provides direction for the Cx process during design and construction, provides resolution for issues such as scheduling, roles and responsibilities, lines of communication and reporting, approvals and coordination.

1.5 COMMISSIONING TEAM

.1 The commissioning team shall consist of:

.1 Health Authority Representative(s):
- .1 Design Manager (DM).
- .2 Construction Manager (CM).
- .3 Project Coordinator (PC).
- .4 Engineer/Architect/Consultant (AE).

.2 User Representatives/Owner.

.3 General Contractor (GC):
- .1 Mechanical Contractor.
- .2 Fire Protection Contractor.
- .3 Controls Contractor (CC).
- .4 Electrical Contractor.
- .5 Fire Alarm Contractor.
- .6 Security Systems Contractor.
- .7 Communications Systems Contractor.

.4 Commissioning Authority (CxA).

.5 Manufacturer's Technicians.

.6 Testing Agencies.

.7 Building Manager (BM).

.8 Design Consultant (DC).

.2 Roles of the commissioning team shall be as follows:

.1 CxA (Commissioning Authority):
- .1 Reviews Owner's Project Requirements, Basis of Design and design documents at all stages of submittal and provides comments to the DM.
- .2 Records all comments as history for the project commissioning.
- .3 Reviews the Commissioning Manual with the DM and DC, and modifies based on their comments as necessary.
- .4 Reviews "Issued for Construction" Commissioning Manual to the DM.
- .5 Provides guidance on the Commissioning Process, and responsibilities of Commissioning Team members.
- .6 Reviews contractor shop drawings for related commissioning information.
- .7 Coordinates and chairs (in person or via teleconference) the commissioning kick-off meeting and progress meetings.
- .8 Prepares and distributes the meeting agenda and minutes.
- .9 Attends when necessary Installation Verification.
- .10 Reviews completed Installation Verification checklists and signs off.
- .11 Attends Performance Verification and signs off on check lists.
- .12 Attends owner training sessions.
- .13 Verifies that training is complete.
- .14 Reviews completed Cx manual as submitted by the contractor.
- .15 Prepares Summary Commissioning Report and submits to the CM.

.16 Prepares letter for CM indicating acceptance of the completed commissioning activities.

.17 Verifies that seasonal or deferred Commissioning is completed.

.18 Coordinates ten (10) month building review and issues occupant survey.

.2 DM (Design Manager):

.1 Reviews Owner's Project Requirements, Basis of Design and design documents at all stages of submittal. Compiles all comments from all reviewers and submits to document originator.

.2 Submits all documentation required by the CxA in a timely manner.

.3 Identifies Cx team members.

.4 Provides a list of equipment and systems included in the design to the CxA for inclusion in preliminary manual.

.5 Reviews Cx manual in draft and final revisions. Provides comments to the CxA as necessary on the Commissioning Manual.

.6 Forwards the Cx Manual for review by the DC, receives comments and issues them to the CxA.

.7 Ensures that the Cx Manual is issued with the tender documents.

.8 Issues IFC Cx Manual to the CM.

.9 Reviews contractor shop drawings and provide comments to the CM.

.10 Attends Cx kick-off meeting during the design phase.

.11 Attends commissioning progress meetings as required.

.12 Attends Installation Verification as required.

.13 Attends Cx Performance Verification or provides representative.

.14 Attends training sessions or sends representative knowledgeable in the design.

.15 Assists with ten (10) month building review.

.3 CM (Construction Manager):

.1 Main contact for CxA during construction phase.

.2 Distributes "Issued for Construction" Cx Manual to GC.

.3 Notifies CxA of any Cx related issues raised during construction (i.e. change orders).

.4 Provides times during any project meetings to discuss Cx with the entire team.

.5 Attends Cx meetings (construction phase).

.6 Coordinates Cx schedule for Installation Verification and Performance Verification with GC and ensures all TW representatives are available to witness testing as required for Installation Verification and Performance Verification.

.7 Attend Performance Verification.

.8 Ensures Cx Team is following/completing Cx Manual.

.9 Coordinates training schedules, and arranges for video recording of sessions if required.

.10 Reviews project record documents.

.11 Ensures that O&M manuals, maintenance materials, as-built drawings and warranties have been submitted and reviewed.

.12 Provides CxA with reviewed As Built documents, O&M Manuals, and Warranties for inclusion in the Summary Commissioning Report.

.13 Receives the completed Cx Manual from the GC and submits to the CxA for review.

.14 Receives the Summary Commissioning Report from the CxA and submits to the Owner.

.15 Coordinates ten (10) month building review and issues occupant survey.

.16 Verifies that all maintenance materials, spare parts and tools are received from the GC as per specifications.

.4 BM (Building Manager):

.1 Reviews the Basis of Design developed by the DC and provides comments to the DM.

.2 Reviews all design documents and provides comments to the DM.

.3 Coordinates maintenance staff participation in Cx activities.

.4 Reviews O&M documentation and attends training.

.5 Attends all training sessions.

.6 Receives and retains a copy of the Commissioning Summary Report.

.7 Provides maintenance representatives to facilitate the 10 month building review as necessary.

.8 Attends commissioning meetings as necessary.

.5 GC (General Contractor):

.1 Maintains as-built drawings on site during construction.

.2 Submits shop drawing in accordance with the specifications.

.3 Prepares and submits Cx manual for review and approval.

.4 Ensures the Cx Manual is on site and being completed and kept up to date by all sub-trades.

.5 Executes the Cx process ensuring that sub-trades perform their responsibilities and integrate Cx into the construction process.

.6 Ensures equipment manufacturers and vendors provide documentation to facilitate the Commissioning work and perform startups.

.7 Coordinates and schedules Cx activities, submits schedule for review and comment by TW staff.

.8 Conducts Installation Verification and signs off checklists.

.9 Provides written confirmation all systems are operational prior to start of Performance Verification.

.10 Conducts Performance Verification with all required Commissioning Team members present.

.11 Ensures that all required personal are available for the verification.

.12 Maintains an up to date version of the Cx manual on site with checklists completed on installed/operational systems.

.13 Provides all required training.

.14 Coordinates location, schedule.

.15 Provides facilities (location, materials).

.16 Ensures qualified factory trained technicians are available to facilitate training.

.17 Provides copies of all training material.

.18 Obtains occupancy approvals/permits.

.19 Submits completed manual to CM.

.20 Provides the following information for inclusion in the Commissioning Summary Report.

.21 Training Records.

.22 Operation and Maintenance Manuals.

.23 Warranties.

.24 Completed commissioning Checklists.

.25 List of spare parts turned over.

.26 Supplies maintenance materials and tools as per specification.

.27 Attends all commissioning meetings.

.6 PC (Project Coordinator):

.1 If there is no PC assigned to the project, then these duties are completed by the CM.

.2 Attends Installation Verification and Performance Verification demonstrations.

.3 Ensures Cx manual is on site and kept up to date by the GC.

.4 Verifies maintenance materials are provided by the GC as per the contract documents.

.5 Ensures GC is maintaining as-built drawings on site during construction.

.6 Attends training sessions as necessary and directed by the CM.

.7 Attends all commissioning meetings.

.7 Sub Trades:

.1 Demonstrates correct system performance.

.2 Perform commissioning duties as directed by the GC.

.8 DC (Design Consultant):

.1 Reviews the Owner Project Requirements and provides comment to the DM.

.2 Produces the Basis of Design and submits to the DM for review and comment. Revise as necessary based on comments and changes in Owner Project Requirements.

.3 Develops system descriptions and forwards to the CxA, for inclusion in the Cx Manual.

.4 Reviews drafts of the Cx Manual, including the installation and Performance Verification checklists, and provides comments to the DM.

.5 Provides project narrative for inclusion in the Cx Manual.

.6 The DC shall provide to the CxA a complete list of all equipment and information required to populate the commissioning checklists with the following information:

.1 identification number.

.2 location.

.3 type, proposed manufacture, make, model.

.4 operating parameter (max, normal, min).

.5 electrical requirements.

.6 control comments.

.7 other pertinent information.

.7 Incorporates commissioning specification into the project documents.

.8 Reviews contractor shop drawing submittals.

.9 Attends periodic site visits to ensure systems meet the design intent and operate as outline in the specifications.

.10 Attends and signs off checklist for Installation Verification.

.11 Attends Performance Verification and signs off on checklists for the appropriate discipline.

.12 Reviews Systems Manuals to the CM (these will be included in the Commissioning Summary Report).

.13 Provides system overview during training.

.14 Attends training as required.

.15 Attends commissioning meetings.

.16 Attends ten (10) month building review activities.

.9 Owner:

.1 Produces the Owner Project Requirements and submits to the DM.

.2 Reviews the Basis of Design developed by the DC and provides comments to the DM.

.3 Reviews all design documents and provides comments to the DM.

.4 Coordinates maintenance staff participation in Cx activities.

.5 Reviews O&M documentation and attends training.

.6 Attends all training sessions.

.7 Receives and retains a copy of the Commissioning Summary Report.

.8 Provides maintenance representatives to facilitate the ten (10) month building review as necessary.

.9 Attends commissioning meetings as necessary.

1.6 NON-CONFORMANCE TO PERFORMANCE VERIFICATION REQUIREMENTS.

.1 During Cx, should equipment, system components, and associated controls be identified as incorrectly installed, malfunctioning or not performing as per specifications, the contractor shall correct deficiencies, re-verify equipment and components within the system, including related systems as deemed necessary by Engineer/Architect, to ensure effective and accurate operation.

.2 Minor deficiencies may be corrected at the time of identification. For systems requiring major repairs, the Commissioning Team shall move on to the next system to be commissioning. The Contractor shall notify the CM when the work is complete.

.3 Costs for corrective work, additional tests, inspections, to determine acceptability and proper performance of such items to be borne by Contractor.

1.7 CONFLICTS

.1 Report conflicts between requirements of this section, other sections, and the Cx Manual to the CM to obtain clarification prior to the start of work.

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

1.8 SUBMITTALS

.1 Prior to starting Cx the Contractor shall provide a set of equipment and system submittals. These submittals are supplemented by the installation and start-up procedures, O&M data, performance data, control drawings and any changes that may affect commissioned systems.

.2 Submit no later than four (4) weeks after award of Contract:

.1 Name of Contractor's Cx coordinator.

.2 Preliminary Cx schedule. Submit final Cx schedule to CxA for review prior to performance verification.

.3 Submit the names of all personnel for approval by the CxA. Designate who has managerial responsibilities for coordination of installation verification and performance verification.

.4 Submit documentation to confirm personnel compliance with quality assurance provisions.

.3 Any changes to the information submitted must be re-submitted Ensure certified trades persons, certified testing agencies and/or factory authorized personnel participate in commissioning tasks.

.4 Prior to start of Performance Verification:

.1 Submit TAB report to CxA for review.

.2 Submit start-up documentation to CxA for review.

.3 Submit completed Installation Verification checklists.

.5 Fifteen (15) days prior to application for Substantial Completion:

.1 Submit three (3) copies of final commissioning manual and applicable forms to the CM for review.

.2 Submit reports of performance verifications postponed due to seasonal, climatic, occupancy, or other reasons beyond the Contractor's control, promptly after execution of those services.

.6 Ensure each form bears the required signatures as indicated on the form.

.7 Submit as-built drawings, schematics, O&M manuals, maintenance materials and warranties to CM for review.

1.9 COMMISSIONING DOCUMENTATION

.1 Refer to Section 01 91 33 - Commissioning (Cx) Forms for requirements and instructions for use as well as the Cx Manual

.2 Checklists will be provided to the Contractor by the CM during the construction stage.

.3 Installing subcontractors are to date and initial the checklists as construction and verifications are completed.

.4 The general contractor is to submit completed checklists to the CxA for review and acceptance.

.5 Once all documents have been reviewed and accepted the general contractor shall submit final commissioning documents in electronic form (PDF) and original signed copies.

1.10 COMMISSIONING SCHEDULE

.1 Submit preliminary Cx schedule in Gantt Chart format to CxA no later than four (4) weeks after award of contract. A sample Cx Schedule is provided in the Cx Manual.

.2 Submit final Cx schedule in Gantt Chart format to CxA for review four (4) weeks prior to performance verification. A sample Cx Schedule is provided in the Cx Manual.

.3 Provide adequate time for Cx activities prescribed in technical sections, commissioning sections and the Cx manual including all on site activities as well as documentation procedures. Time should be allowed for re-verification should any system be rejected upon completion of initial verification.

.4 Provide adequate time for training.

1.11 COMMISSIONING MEETINGS

.1 The CM will convene Cx meeting consisting of all members of the design and construction teams to address building systems to be commissioned. Items to be discussed will include commissioning requirements, completion and start-up schedules, and roles and responsibilities.

.2 CxA to make necessary updates and changes to the CxManual and deliver to the CM who will distribute to all other parties as necessary.

.3 Convene Cx meetings following project meetings and as specified herein to resolve issues, monitor progress and identify deficiencies relating to Cx.

.4 Continue Cx meetings on regular basis until commissioning deliverables have been addressed.

.5 At 60% construction completion stage CxA to call a separate Cx meeting to review progress, discuss schedule of equipment start-up activities and prepare for Cx. Issues at meeting to include:

.1 Review duties and responsibilities of Contractor and subcontractors, addressing delays and potential problems.

.2 Determine the degree of involvement of trades and manufacturer's representatives in the commissioning process.

.6 Thereafter Cx meetings to be held until project completion and as required during equipment start-up and functional testing period.

.7 Meetings will be chaired by the CxA or CM, meeting minutes will be prepared and issued by the CxA or CM. Clarifications to the minutes must be submitted within 5 days of issue, after which, the issued set becomes the official project record.

.8 Ensure subcontractors and relevant manufacturer representatives are present at 60% and subsequent Cx meetings and as required.

1.12 STARTING AND TESTING

.1 Contractor assumes liabilities and costs for inspections, including disassembly and re-assembly after approval, starting, testing and adjusting, and supply of testing equipment, and all associated costs of installation and performance verification.

1.13 WITNESSING OF STARTING AND TESTING

.1 Provide twenty eight (28) days' notice prior to commencement.

.2 Owner's Representative to witness start-up and testing.

.3 Contractor's Cx Coordinator to be present at tests performed and documented by sub-trades, suppliers and equipment manufacturers.

1.14 MANUFACTURER'S INVOLVEMENT

.1 The Contractor shall obtain manufacturers installation, start-up and operations instructions prior to start-up of components, equipment and systems..

.1 Compare completed installation with manufacturer's published data, record discrepancies, and review with manufacturer.

.2 Modify procedures detrimental to equipment performance and review same with manufacturer before start-up.

.2 Integrity of warranties:

.1 Use manufacturer's trained start-up personnel where specified elsewhere in other divisions or required to maintain integrity of warranty.

.2 Verify with manufacturer that testing as specified will not void warranties.

.3 Qualifications of manufacturer's personnel:

.1 Experienced in design, installation and operation of equipment and systems.

.2 Ability to interpret test results accurately.

.3 Ability to report results in clear, concise, logical manner.

1.15 PROCEDURES

.1 Verify that equipment and systems are complete, clean, and operating in normal and safe manner prior to conducting Performance Verification.

.2 Conduct Commissioning in following distinct phases:

.1 Included in delivery and installation:

.1 Verification of conformity to specification, approved shop drawings and completion of product information report forms.

.2 Visual inspection of quality of installation.

.2 Installation Verification: follow accepted start-up procedures.

.3 Performance Verification: document equipment performance. Include repetition of tests after correcting deficiencies.

.4 Post-substantial performance verification: to include fine-tuning.

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

.4 Document required tests on checklists provided in the Cx Manual as well on any supplied Manufacturer forms.

.5 Failure to follow accepted Commissioning Processes will result in re-evaluation of equipment by an independent testing agency selected by CxA. If results reveal that equipment Commissioning Process was not in accordance with requirements, and resulted in damage to equipment, implement following:

.1 Minor equipment/systems: if evaluation report concludes that damage is minor, implement corrective measures approved by CxA.

.2 Major equipment/systems: If evaluation report concludes that major damage has occurred, CxA shall reject equipment to be removed from site and replaced with new.

.3 Subject new equipment/systems to specified Commissioning Process

1.16 COMMISSIONING DOCUMENTATION

.1 Assemble Installation Verification documentation and submit to CxA for approval before commencement of Performance Verification.

.2 Installation Verification documentation to include:

.1 Factory and on-site test certificates for specified equipment.

.2 Inspection reports.

.3 Signed Installation Verification check lists.

.4 Start-up reports.

.5 Step-by-step description of complete start-up procedures, to permit the contractor or CxA to repeat start-up at any time.

1.17 OPERATION AND MAINTENANCE OF EQUIPMENT AND SYSTEMS

.1 After Performance Verification, operate and maintain equipment and systems as directed by equipment/system manufacturer.

.2 With assistance of manufacturer develop written maintenance program and submit to CxA for approval before implementation.

.3 Operate and maintain systems for minimum twenty one (21) days for commissioning to be completed.

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

1.18 TEST RESULTS

.1 If start-up, testing and/or performance verification produce unacceptable results, repair, replace or repeat specified starting and/or performance verification procedures until acceptable results are achieved.

.2 Provide personnel, resources and materials, assume all costs for re-verification.

1.19 INSTRUMENTS / EQUIPMENT

.1 Submit to CxA for review and approval:

.1 Complete list of instruments proposed to be used.

.2 Listed data including, serial number, current calibration certificate, calibration date, calibration expiry date and calibration accuracy.

.2 Provide all required equipment to complete commissioning.

.3 Provide all Arc Flash Personal Protective Equipment as required. Provide commissioning personnel with the appropriate Arc Flash Protection training.

1.20 PERFORMANCE VERIFICATION

.1 Conduct performance verification once identified pre-requisite activities are completed for a system and approved by the CxA.

.2 Commissioning Coordinator to issue a commissioning plan based on the complexity of nurse call systems. Contractor to develop and implement a detailed schedule of commissioning related activities.

.3 Test new nurse call system and operating procedures by challenging these systems to realistic operating conditions and train operational staff.

.4 Carry out Cx:

.1 Under actual operating conditions, over entire operating range, in all modes.

.2 On independent systems and interacting systems.

.5 Cx procedures to be repeatable and reported results are to be verifiable.

.6 Follow equipment manufacturer's operating instructions.

.7 Contractor to obtain all documentation, including updated points list, controls sequences and set-points, and submit documentation to commissioning authority for review. At

completion of commissioning, scan completed manuals to electronic format on CD(s) in PDF format as required and submit to CxA.

1.21 WITNESSING COMMISSIONING

.1 CxA along with designated representatives to witness activities and verify results.

1.22 AUTHORITIES HAVING JURISDICTION

.1 Where specified start-up, testing or commissioning procedures duplicate verification requirements of authority having jurisdiction, arrange for authority to witness procedures so as to avoid duplication of tests and to facilitate expedient acceptance of facility.

.2 Obtain certificates of approval, acceptance and compliance with rules and regulation of authority having jurisdiction.

.3 Provide copies to CxA within five (5) working days of test and with Cx report.

1.23 REPEAT VERIFICATIONS

.1 Assume costs incurred by Owner’s Commissioning representatives for second and subsequent verifications where:

.1 Verification of reported results fails to receive CxA's approval.

.2 Repetition of second verification again fails to receive approval.

.3 CxA deems Contractor's request for second verification was premature.

1.24 DEFICIENCIES, FAULTS, DEFECTS

.1 Report problems, faults or defects affecting Cx to Engineer/Architect in writing. Stop Cx until problems are rectified. Proceed with written approval from CxA.

.2 Correct deficiencies found during start-up and Cx to satisfaction of CxA.

1.25 COMPLETION OF COMMISSIONING

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

.2 Except for warranty and seasonal verification activities, complete Cx prior to application for Substantial Completion.

.3 Cx to be considered complete when all Cx deliverables have been submitted and accepted by CxA.

.4 The CxA is to compile a Final Commissioning Report summarizing all tasks, findings and documentation of the commissioning process. The Final Commissioning Report is to incorporate all test reports by sub-contractors, manufacturer’s and controlling authorities including the following list. The Contractor shall turn over all materials per this specification.

.1 Deficiencies that were discovered and measures taken to correct them.

.2 Functional test procedures and results.

.3 Documentation of all commissioning field activities as they progressed.

.5 The Contractor to provide O&M manuals, maintenance materials, warranties and training records.

1.26 ACTIVITIES UPON COMPLETION OF COMMISSIONING

.1 When changes are made to baseline components or system settings established during Cx process notify the CxA. The CxA will update and provide Cx forms for affected item.

1.27 TRAINING

.1 In accordance with Section 01 91 41 - Commissioning (Cx) – Training, the Cx Manual and respective technical sections.

1.28 MAINTENANCE MATERIALS, SPARE PARTS, SPECIAL TOOLS

.1 Supply, deliver, and document maintenance materials, spare parts, and special tools as specified in contract. Provide transmittal documenting all materials provided.

1.29 OCCUPANCY

.1 Cooperate fully with CxA during stages of acceptance and occupancy of facility.

1.30 PERFORMANCE VERIFICATION TOLERANCES

.1 Application tolerances:

.1 Specified range of acceptable deviations of measured values from specified values or specified design criteria, except for special areas, to be within +/- 5 % of specified values.

.2 Instrument accuracy tolerances:

.1 To be of higher order of magnitude than equipment or system being tested.

.3 Measurement tolerances during verification:

.1 Unless otherwise identified, recorded values to be within +/- 2 % of specified values.

1.31 OWNER'S PERFORMANCE TESTING

.1 Performance testing of equipment or system by CxA will not relieve Contractor from compliance with specified start-up and testing procedures.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 SCHEDULE

.1 Provide a detailed schedule as per this section for on-site verification activities by the commissioning team based on the Cx Manual provided by the CxA. Be responsible for resource allocation respecting the exact number and duration for personnel required to perform the tasks required.

.2 This schedule shall be submitted with the general construction schedule monthly. The level of detail shall increase as the construction progresses.

3.2 COMMISSIONING TASKS

.1 Refer to the Cx Manual provided by the CxA for a list of tasks to be conducted for the commissioning process. Further specifics are provided within applicable specification sections.

3.3 DISCIPLINE: ARCHITECTURAL

.1 Systems to be Commissioned

.1 Room Fit-up & Finishes

.1 Confirm all ceiling systems installed as per manufacturer's requirements.

.2 Confirm ceiling integrity.

.3 Verify spare products provided and signed off by operating staff.

.4 Confirm wall finishes. Include paint type, number and colour chip each location.

.5 Demonstrate maintenance required.

.6 Provide Technical Support Inspector's inspection report verifying finishes have met contract requirements.

.2 Occupant Safety and Accessibility

.1 Fire Separations

.1 Verify fire stopping and smoke seals in place.

.2 Verify sleeves in hollow walls around piping.

.3 Verify continuity and ratings of fire separations.

.4 Verify proper fire separations at firewalls, including parapets.

3.4 DISCIPLINE: ELECTRICAL

.1 Systems to be Commissioned

.1 Equipment Enclosures, Splitters, Junction Boxes.

.1 Confirm all conduit and cable connections seated properly in enclosure.

.2 Confirm locknuts and bushings on all conduit connections. Double locknuts on RGS.

.3 Confirm proper grounding and bonding.

.4 Confirm proper support.

.5 Confirm identification installed.

.2 Wiring Devices.

.1 Confirm devices installed in proper location.

.2 Confirm proper voltage/amperage rating.

.3 Confirm proper polarity.

.4 Confirm cover plate installed flush on wall.

.5 Confirm identification completed.

.3 Circuit Breakers.

.1 Confirm breaker size as specified.
.2 Confirm breaker properly torqued to panel bus.
.3 Confirm load conductors properly torqued to breakers.
.4 Confirm GFCI breakers operate properly.
.5 Confirm AFCI breakers operate properly.
.6 Confirm voltage and amperage load on all circuit breakers. Record results.

.4 Conduits.
.1 Confirm all conduits proper size and type.
.2 Confirm all conduits properly supported.
.3 Confirm conduit fill not exceeded.
.4 Confirm all in slab conduits noted on as-builts.
.5 Confirm pull ropes installed in all spare conduits.
.6 Confirm bonding conductor installed in all conduits.

.5 Grounding
.1 Confirm all grounding system installed and connections made are secure. (Primary and secondary grounds.)
.2 Verify connections and conductors protected from mechanical injury.
.3 Ensure compliance with the specification.
.4 Confirm bonding wire used in all conduit systems.

.6 Nurse Call System
.1 Verify that system components have been located and installed in accordance with the contract documents.
.2 Demonstrate maintenance procedures for all system components.
.3 Provide Manufacturer's representative for testing of system.
.4 Demonstrate by operation all devices for the nurse call system.
.5 Train all designated staff in proper operation of system.
.6 Commissioning to be conducted by factory trained technician.
.7 Provide copy of warranty.

.7 Control Wiring
.1 Confirm conductor size and type in accordance with specification.
.2 Confirm cable shields grounded at source end only.
.3 Confirm wiring installed in accordance with specification.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

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

1.2 RELATED SECTIONS

.1 Section 01 78 00 – Closeout Submittals.

.2 Section 01 91 13 – Commissioning (Cx) Requirements.

.3 Section 01 91 41 – Commissioning (Cx) Training.

1.3 INSTALLATION VERIFICATION CHECK LISTS

.1 Prior to initiation of Performance Verification the contractor will develop and provide to the CxA the required project specific Cx Manual which will include the Installation Verification check lists for review and approval..

.2 Completed Installation Verification Checklists to be submitted to CxA for review and approval.

.3 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.

.4 Equipment manufacturer's installation/start-up check lists are acceptable for use in conjunction with installation verification check lists forming part of the Cx manual. Manufacturer’s check sheets used must be attached to final document submittals.

.5 Installer to sign check lists upon completion, certifying stated checks and inspections have been performed. Completed check lists to be submitted by the contractor at completion of the Commissioning Process.

.6 Use of check lists will be considered part of commissioning process.

1.4 PERFORMANCE VERIFICATION CHECK LISTS

.1 The contractor will develop and provide to the CxA the required project specific Cx Manual including the Performance Verification check lists for review and approval.

.2 Completed Performance Verification Checklists to be submitted to CxA for review and approval.

.3 Strategy for Use:

.1 Contractor will provide required shop drawings information and verify correct installation and operation of items indicated on these forms.

.2 Confirm operation as per design criteria and intent.

.3 Identify variances between design and operation and reasons for variances.

.4 Record analytical and substantiating data.

.5 Verify reported results.

.6 Form to bear signatures of recording technician and reviewed and signed off by General Contractor, Installing Contractor, Consultant, DTW Representative, and the Commissioning Agent.

.7 Maintain copy on site during start-up, testing and commissioning period.

.8 Forms to be both hard copy and electronic format.

.4 Upon completion of Performance Verification the contractor shall submit all completed checklists to the CxA.

.5 Final submittal shall include all Installation Verification, Performance Verification check lists, training records, maintenance materials transmittals, written warranties and a list of all Cx activities postponed due to seasonal, climatic, occupancy, or other reasons beyond the contractor's control.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES:

.1 This Section specifies roles and responsibilities of Commissioning Training.

1.2 RELATED SECTIONS:

.1 Section 01 78 00 – Closeout Submittals.

.2 Section 01 91 13 – Commissioning (Cx) Requirements.

.3 Section 01 91 33 – Commissioning (Cx) Forms.

1.3 TRAINEES

.1 Trainees: personnel selected for operating and maintaining this facility including, but not limited to, Facility Manager, building operators, maintenance staff, security staff, and technical specialists as required.

.2 Trainees may be available for training during any stage of construction.

1.4 INSTRUCTORS

.1 The Cx Manual will contain:

.1 Descriptions of systems.

.2 Instruction on design philosophy, design criteria, and design intent.

.2 Contractor and certified factory-trained manufacturers' personnel: to provide instruction on the following:

.1 Start-Up, operation, shut-down and maintenance of equipment, components and systems.

.2 Control features and reasons for, results of, implications on associated systems of adjustment of set points of control and safety devices.

.3 Instructions on servicing, maintenance and adjustment of systems, equipment and components.

.4 Training to be completed after Installation and Performance Verification are completed.

1.5 TRAINING OBJECTIVES

.1 Training to be detailed and of sufficient duration to ensure:

.1 Safe, reliable, cost-effective, energy-efficient operation of systems in normal and emergency modes under all conditions.

.2 Effective on-going inspection, measurements of system performance.

.3 Proper preventive maintenance, diagnosis, trouble-shooting and maintenance.

.4 Ability to update documentation.

.5 Ability to operate equipment and systems under emergency conditions until appropriate qualified assistance arrives.

1.6 TRAINING MATERIALS

.1 Instructors to be responsible for content and quality. Provide copies for all those in attendance.

.2 Training materials to include:

.1 "As-Built" Contract Documents.

.2 Operating Manual.

.3 Maintenance Manual.

.4 Testing, adjusting and balancing and performance verification reports where applicable.

.3 Owner's Representative will review training manuals.

.4 Training materials to be in a format that permits future training procedures to the same degree of detail with or without the instructor.

1.7 SCHEDULING

.1 Contractor to include in schedule time for training. Provide a detailed commissioning schedule indicating all Cx tasks and training.

.2 Deliver training during regular working hours, training sessions to be determined in Commissioning meetings.

.3 Training to be completed prior to Substantial Completion.

1.8 RESPONSIBILITIES

.1 Be responsible for:

.1 Implementation of training activities,

.2 Coordination among instructors,

.3 Quality of training, training materials,

.2 Owner's Representative will evaluate training and materials.

.3 Upon completion of training, provide written report, signed by Instructors, witnessed by Owner's Representative. Include list of those in attendance. The Cx manual will provide templates for these submittals.

1.9 TRAINING CONTENT

.1 Training to include demonstrations by Instructors using the installed equipment and systems.

.2 Content includes:

.1 Review of facility and occupancy profile.

.2 Functional requirements.

.3 System philosophy, limitations of systems and emergency procedures.

.4 Review of system layout, equipment, components and controls.

.5 Equipment and system start-up, operation, monitoring, servicing, maintenance and shut-down procedures.

.6 System operating sequences, including step-by-step directions for starting up, shut-down, operation of valves, dampers, switches, adjustment of control settings and emergency procedures.

.7 Maintenance and servicing.

.8 Trouble-shooting diagnosis.

.9 Inter-Action among systems during integrated operation.

.10 Review of O&M documentation.

.3 Provide specialized training as specified in relevant Technical Sections of the construction specifications.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION