

SPECIFICATION

**Puffin Island Fuel Tank Replacement
Bonavista Bay, NL
PN: F6879-209223**

ISSUED FOR TENDER


MECHANICAL CONSULTANT

Crosbie Engineering Limited
1243 Kenmount Road, Suite 102
Paradise, NL A1L 0V8

DATE

January 8, 2021

MECHANICAL PERMIT

	PROVINCE OF NEWFOUNDLAND
	PERMIT HOLDER Class "A" This Permit Allows CROSBIE ENGINEERING LIMITED
To practice Professional Engineering in Newfoundland and Labrador Permit No. as issued by PEG-NL <u>D0123</u> which is valid for the year <u>2021</u> .	

MECHANICAL STAMP



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Section 01 11 00 – Summary of Works

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PART 1 **GENERAL**

1.1 **SECTION INCLUDES**

- .1 Contractor use of premises.
- .2 Owner occupancy.

1.2 **WORK COVERED BY CONTRACT DOCUMENTS**

- .1 Work of this Contract is as outlined here and also in the contract drawings and specifications. The work generally comprises of replacement of the three fuel tanks, dispensing cabinet and associated piping, controls, electrical. Plus any other work as indicated in the tender documents. Further description of the work follows below.
- .2 The scope of this project includes, but is not limited to, the following elements:
 - .1 Three fuel tanks are being replaced in this contract.
 - .1 A 6819L diesel tank c/w a cabinet housing a hose reel, fuel transfer pump, controls all in a cabinet. This tank also has an external overfill alarm connected to it along with an emergency pump shut off. This tank is located on a large concrete pad adjacent to the generator building. This tank has the bulk diesel fuel that from time to time is transferred to the dwelling diesel tank and the day tank using the hose and reel.
 - .2 A 900L diesel tank adjacent to the lighthouse keepers dwelling. This tank serves the furnace in the dwelling.
 - .3 A 900L diesel ‘day tank’ that serves the generators. This day tank is located outside on the large concrete pad adjacent to the generator building
 - .2 As part of the demolition of the tanks services to the site must be maintained. The contractor is to take all steps ensuring services are maintained and coordination with the owner is paramount. The contractor is to sequence the work to ensure the dwelling heat is maintained, and a generator daytank is always available.
 - .3 As part of the demolition the fuel must be disposed of meeting all provincial and federal regulations, and disposal forms and a log of the disposal must be provided to the owner or engineer.
 - .4 The three new tanks will be provided as follows:
 - .1 The new 6819L diesel tank is to be STAINLESS STEEL CONSTRUCTION. Double wall. Spill containment tray. Other features as outlined in the drawings and specifications. Tank is to be c/w a cabinet housing a hose reel, fuel transfer pump, and dispensing safeties and controls. This tank also has an external overfill alarm connected to it along with an emergency pump shut off. This tank is to be located on

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- a large concrete pad adjacent to the generator building. This tank will be filled with fuel after successful installation by the OWNER.
- .2 A new 900L diesel tank adjacent to the lighthouse keepers dwelling. Tank is to be STAINLESS STEEL CONSTRUCTION. Double wall. Spill containment tray. Other features as outlined in the drawings and specifications. This tank will be filled with fuel after successful installation by the CONTRACTOR.
- .3 A new 900L diesel ‘day tank’ that serves the generators. This day tank is to be FIBREGLASS Construction. Double wall. Spill containment tray. Other features as outlined in the drawings and specifications. The tank will be installed in a new location, it will be moved inside the generator building adjacent to the generators. See drawings and specifications. This tank will be filled with fuel after successful installation by the CONTRACTOR.
- .5 Plus any and all other work as outlined through the drawings and specifications.
- .3 During the course of construction the contractor is to provide a temporary fuel supply to suit the Puffin Island Site operations as needed to ensure no loss of services.
- .4 Accommodations onsite are to be coordinated with the Canadian Coast Guard site manager.
- Contractors are permitted to reside in the “Prefab building” located on the site. Contractor responsible for all food and any needs related to the accommodation building that is provided as-is where-is. Building is equipped with lights and electricity, toilet, sinks (kitchen & bathroom), shower stall, hot water boiler. Building is not connected to power or site generator (contractor will need to bring their own generator).
- Contractor also responsible for commissioning, cleaning, and decommissioning of “Prefab building” as outlined in Appendix B herein.
- .5 Contractor shall be in good standing with WHSCC.
- .6 All of the Contractor’s work and associated safety plan documentation is to be included in a Site Specific Safety Plan (SSSP). The SSSP shall also address mechanical work in accordance with OHS regulations and include all relevant requirements of CSA Standard latest edition. Lockout tag-out regulatory requirements must be followed. Contractor should note mechanical workers for this project shall be provided in accordance with the provincial regulations in the ratios required for journeyman and apprentice. Contractor shall provide information on workers on site for the project as requested.
- No work is to commence until the SSSP is reviewed by the Project Manager and deemed to meet the intent of the tender documents.
- .7 Schedule is to be noted as critical under this contract. Time is of the essence:
- .1 All work may be completed during regular work hours.

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- .2 Integrity of all life safety systems must be maintained at all times.
 - .1 Cleaning of all floors, walls, ceilings, and removal of all debris and construction tools and materials at the end of each shift;
- .3 COVID 19
 - .1 Due to the COVID-19 pandemic all provincial safety and personal guidelines must be adhered to.
- .4 Dust Control Procedures: provide and maintain Dust Control Barriers as required.
- .5 The Contractor must attain any and all permits required by the Authorities Having Jurisdiction (AHJs) - Municipal/Service NL/Fire Commissioner.

1.3 CONTRACTOR USE OF PREMISES

- .1 Contractor has restricted use of site.
- .2 Coordinate use of premises under direction of Departmental'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 Departmental's Representative.

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.

1.5 RELATED WORK

- .1 The following specification sections are referenced to indicate work responsibilities as specified and carried in other versions.
 - .1 Section 23 05 00 – Common Work Results for HVAC.
 - .2 Division – Utilities

1.6 ON-SITE DOCUMENTS

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

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1.7 CONTRACT DOCUMENTS

- .1 Legends and schedules in the Issued for Tender Drawings take precedence over the Technical Specifications with respect to products and materials identified.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

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Section – 01 14 00 Work Restrictions

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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 – Construct Progress Documentation.
- .2 Section 01 56 00 - Temporary Barriers and Enclosures.

1.3 EXISTING SERVICES

- .1 Notify Owner’s Representative of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Departmental’s Representative a notice of three (3) working days for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions to a minimum.
- .3 Provide for pedestrian and vehicular traffic as required.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

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Section 01 31 00 - Project Management and Coordination

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PART 1 **GENERAL**

1.1 **SECTION INCLUDES**

- .1 Coordination work with other contractors and subcontractors under administration of Departmental's Representative.
- .2 Scheduled project meetings.

1.2 **RELATED SECTIONS**

- .1 Section 01 11 00 - Summary of Work.

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 Departmental's Representative.

1.4 **PROJECT MEETINGS**

- .1 Project meetings to be held at times and locations as determined by Departmental's Representative.
- .2 Departmental's Representative will arrange project meetings.
- .3 Contract Admin. Consultant to record and distribute minutes.

1.5 **CONSTRUCTION ORGANIZATION AND START-UP**

- .1 Within ten (10) working 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 in accordance with Section 01 33 00 - Submittal Procedures.
 - .4 Delivery schedule of specified equipment in accordance with Section 01 32 00 - Construction Progress Documentation.
 - .5 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, and administrative requirements.

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- .6 Record drawings in accordance with Section 01 78 00 - Closeout Submittals.
 - .7 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
 - .8 Take-over procedures, acceptance, and warranties in accordance with Section 01 77 00 - Closeout Procedures and 01 78 00 - Closeout Submittals.
 - .9 Monthly progress claims, administrative procedures, photographs, and holdbacks.
 - .10 Appointment of inspection and testing agencies or firms in accordance with Section 01 45 00 - Quality Control.
- .4 Comply with Departmental's Representative's allocation of mobilization areas of site; for field offices, for access, traffic, and parking facilities.
 - .5 During construction coordinate use of site and facilities through Departmental's Representative's procedures for intra-project communications: Submittals, reports and records, schedules, coordination of drawings, recommendations, and resolution of ambiguities and conflicts.

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 Departmental's Representative coordinated with Departmental's Representative'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 Departmental's Representative.

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1.8 SUBMITTALS

- .1 Make submittal to Departmental's Representative for review.
- .2 Submit preliminary shop drawings and product data 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 Departmental's Representative.
- .3 Submit requests for payment for review to Departmental's Representative.
- .4 Submit requests for interpretation of Contract Documents, and obtain instructions through Departmental's Representative.
- .5 Process change orders through Departmental's Representative.
- .6 Deliver closeout submittals for review by Departmental's Representative.

1.9 COORDINATION DRAWINGS

- .1 Provide information required by Departmental's Representative for preparation of coordination drawings.
- .2 Review and approve revised drawings for submittal to Departmental's Representative.
- .3 Departmental's Representative 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 Departmental's Representative when Work is considered ready for Substantial Performance.
- .2 Accompany Departmental's Representative on preliminary inspection to determine items listed for completion or correction.
- .3 Comply with Departmental's Representative's instructions for correction of items of Work listed in executed certificate of Substantial Performance and for access to Owner-occupied areas.
- .4 Notify Departmental's Representative of instructions of items of Work determined in Departmental's Representative's final inspection.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

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 Product Delivery Schedule.
 - .4 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 Departmental's Representative.
- .4 Departmental's Representative will review schedule and return review copy within ten (10) working days after receipt.
- .5 Resubmit finalized schedule within seven (7) working days after return of review copy.
- .6 Submit revised progress schedule with each application for payment.
- .7 Distribute copies of revised schedule to:
 - .1 Subcontractors.
 - .2 Other concerned parties.

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Section 01 32 00 - Construction Progress Documentation

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- .8 Instruct recipients to report to Contractor within ten (10) working 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.
- .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 and product data.
- .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.

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 and product data to Departmental's Representative for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for 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 Departmental's Representative.
- .3 Present shop drawings and product data 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 Departmental's Representative. 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 as to specific project will be returned without being examined and shall be considered rejected.
- .6 Notify Departmental's Representative, 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 Departmental's Representative's review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental's Representative review of submission, unless Departmental's Representative gives written acceptance of specific deviations.

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- .10 Make any changes in submissions which Departmental's Representative may require consistent with Contract Documents and resubmit as directed by Departmental's Representative. When resubmitting, notify Departmental's Representative in writing of revisions other than those requested.
- .11 Notify Departmental's Representative, in writing, when resubmitting, of any revisions other than those requested by Departmental's Representative.
- .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 ten (10) working days for Departmental's Representative review of each submission.
- .5 Adjustments made on shop drawings by Departmental's Representative are not intended to change contract price. If adjustments affect value of Work, state such in writing to Departmental's Representative 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 Structural Attachments:
 - .1 Make changes in shop drawings as Departmental's Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental's Representative in writing of revisions other than those requested.
- .7 Accompany submissions with transmittal letter, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.

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- .5 Other pertinent data.
- .8 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.
- .9 After Departmental's Representative review, distribute copies.
- .10 Submit 3 prints plus one electronic copy in PDF format of shop drawings for each requirement requested in specification Sections and as Departmental's Representative may reasonably request.
- .11 Submit electronic copy in PDF format of product data sheets or brochures for requirements requested in Specification Sections and as requested by Departmental's Representative where shop drawings will not be prepared due to standardized manufacture of product.
- .12 Delete information not applicable to project.
- .13 Supplement standard information to provide details applicable to project.
- .14 Cross-reference product data information to applicable portions of Contract Documents.
- .15 If upon review by Departmental's Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and

installation of work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of work may proceed.

- .16 Submit drawings stamped and signed by Professional Engineer registered or licensed in the Province of Newfoundland and Labrador as required.

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 Departmental's Representative is for the sole purpose of ascertaining conformance with the general concept. This review shall not mean that Departmental's Representative 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 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 Canadian Standards Association (CSA)
 - .1 CAN/CSA-Z259.1 Body Belts and Saddles for Work Positioning and Travel Restraint.
 - .2 CAN/CSA-Z259.10 Full body Harnesses.
 - .3 CAN/CSA-Z259.11 Energy Absorbers and Lanyards.
 - .4 CAN/CSA-Z259.2.1 Fall Arresters, Vertical Lifelines and Rails.
 - .5 FCC No. 301 Standard for Construction Operations.
 - .6 CSA Z797, Code of Practice for Access Scaffold.
- .2 FCC No. 302 Standard for Welding and Cutting.
- .3 Transportation of Dangerous Goods Act Regulations.
- .4 Newfoundland Occupational Health and Safety Act, Amended
- .5 Consolidated Newfoundland and Regulations 1149 WMIS Regulations Under the Occupational Health and Safety Act
- .6 Consolidated Newfoundland and Regulations Occupational Health and Safety Regulations under the Occupational Health and Safety Act.
- .7 Canada Labour Code, Part 2.
- .8 National Building Code of Canada.
- .9 Department of Transportation and Works Occupational Health and Safety Manual.

1.2 **RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 41 00 - Regulatory Requirements.

1.3 **SUBMITTALS**

- .1 At least 10 (ten) working days prior to commencing any site work: submit to Departmental's Representative copies of:
 - .1 A complete Site Specific Health and Safety Plan.
 - .2 If work entails confined space, submit the following:

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Section 01 35 29.06 – Health and Safety Requirements

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- .1 Copies of current confined space entry training certificates acceptable to WHSCC, as well as copies of confined space entry programs, confined space assessment, safe work practices and rescue plans.
- .2 Acceptance of the Site Specific Health and Safety Plan and other submitted documents by the Departmental's Representative shall only be viewed as acknowledgement that the contractor has submitted the required documentation under this specification section.
- .3 Departmental's Representative makes no representation and provides no warranty for the accuracy, completeness and legislative compliance of the Site Specific Health and Safety Plan and other submitted documents by this acceptance.
- .4 Responsibility for errors and omissions in the Site Specific Health and Safety Plan and other submitted documents is not relieved by acceptance by Departmental's Representative.

1.4 OCCUPATIONAL HEALTH AND SAFETY (SITE SPECIFIC HEALTH AND SAFETY 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 Site Specific Health and Safety Plan that 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 Site Specific Health and Safety Plan upon request to Occupational Health and Safety Branch, Services NL, Province of Newfoundland and Labrador and the Departmental's Representative.
- .4 The written Site Specific Health and Safety Plan shall incorporate the following:
 - .1 Hazard assessment results.
 - .2 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.
 - .3 An organizational structure which shall establish the specific chain of command and specify the overall responsibilities of contractor's employees at the work site.
 - .4 A comprehensive work plan 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.
 - .5 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.

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- .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.
- .6 An emergency response procedure, refer to Clause 1.5 Supervision and Emergency Response Procedure of this section for requirements.
- .7 A hazard communication program for informing workers, visitors and individuals outside of the work area as required. This will include but not be limited to a visitor safety and orientation policy and program that will include education on hazards, required PPE and accompaniment while on site.
- .8 A complete listing of employee names, their driver's license classification, expiry date, endorsements and the type of equipment that they are qualified to operate for the complete scope of work for this project. The Driver's License Number should not be provided as this is confidential information. Provision of the License Number may breach *PIPEDA* - the Personal Information Protection and Electronic Documents Act. (Federal Act) or *ATIPPA - Access to Information and Protection of Privacy Act* - Part IV. (Provincial Act of Newfoundland and Labrador). This shall also include documentation where required of certification in power line hazards.
- .9 A health and safety training program which includes a safety training matrix.
- .10 General safety rules.
- .5 Periodically review and modify as required each component of the Site Specific Health and Safety Plan when a new hazard is identified during completion of work and when an error or omission is identified in any part of the Site Specific Health and Safety Plan.
- .6 Review the completeness of the hazard assessment 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, evaluating and managing any report of actual or potential hazards.
 - .2 Clearly define accident incident investigation procedures.
 - .3 Clearly define policy and processes for early and safe return to work.
 - .4 Retain copies of all completed hazard assessments at the project site and make available to the Departmental's Representative immediately upon request.
- .7 Implement all requirements of the Site Specific Health and Safety Plan.
 - .1 Ensure that every person entering the project site is informed of requirements under the Site Specific Health and Safety Plan.
 - .2 Take all necessary measures to immediately implement any engineering controls, administrative controls, personal protective equipment required or termination of work procedures to ensure compliance with the Site Specific Health and Safety Plan.

1.5 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.
 - .1 Any person assigned to supervisory duties shall not conduct significant work in relation to the contract that inhibits them from the ability to properly supervise the work site.
- .3 Provide a suitable means of communications and check-in 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 Occupational Health and Safety First Aid Regulations.

1.6 CONTRACTORS SAFETY OFFICER

- .1 The contractor shall employ a Contractor's Safety Officer (CSO) who shall have as a minimum successfully completed the following training, and must have current credentials for those that have expiration dates:
 - .1 Training in hazardous materials management and response/protocols.
 - .2 Training in the use, maintenance of fall protection systems certified by WHSCC at a minimum.
 - .3 Training in the inspection of scaffolding in accordance with CSA Z797.
 - .4 Training in confined space entry protocols, techniques and rescue plans, certified by WHSCC at a minimum.
 - .5 Supervisory training.
 - .6 Training in records and statistics.
 - .7 Training in hazard identification, inspections, analysis and control.
 - .8 Training in WHMIS.
 - .9 Training in health and safety program content.
 - .10 Training in investigations and reporting.
 - .11 Training in occupational health/hygiene.
 - .12 Training in employee training and communication.
 - .13 Training in Emergency Preparedness and First Aid.
 - .14 A working knowledge of, and experience satisfactory to the Department, using the occupational safety and health legislation and regulations specific to Newfoundland and Labrador.
 - .15 Experience, satisfactory to the Department, with the safe work practices required for execution of the work and operation of equipment specific to the project.
 - .16 Experience, satisfactory to the Department, in developing and monitoring site safety and housekeeping policies.
 - .17 Experience, satisfactory to the Department, in developing and monitoring a preventative maintenance and inspection program for Construction Site Equipment.
- .2 The CSO shall:
 - .1 Be responsible to review Emergency Response Plan.
 - .2 Be responsible for developing, implementing, daily enforcement, monitoring and updating of the Site Specific Health and Safety Plan.
 - .3 Be responsible for the delivery of the site safety orientation and ensure that the personnel who have not been orientated are not permitted to enter the site. This applies to workers, inspectors and visitors.
 - .4 Report directly to and be under direction of the Site Superintendent or Contractor's Project Manager.

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- .5 Prior to mobilization on-site, hold an orientation meeting with the contractors, subcontractors and Departmental's Representative to review project occupational health and safety. Include but not limit meeting to a review of:
 - .1 Site Specific Health and Safety Plan.
 - .2 Construction Safety Measures.
 - .3 Supervision and Emergency Rescue Procedures.
 - .4 Hazard Assessments
- .6 Maintain a daily log of inspections, meetings, infractions and mitigating measures. Log is to be filed daily and copies to be provided to the Site Superintendent and Departmental's Representative.

1.7 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.

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.
- .3 Where safety risks exist, the contractor must stop the work until such time as the risk can be mitigated to a safe level.
- .4 Take appropriate steps to ensure that the hazards are mitigated to a safe level, workers are notified of the hazards and how to protect themselves. As well, workers must be provided with any new safe work practices or information regarding mitigation of the risk.

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 Departmental's Representative 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:

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- .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 Departmental's Representative 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 Site Specific Health and Safety 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.
 - .6 Accompanied while on site, and provided with the appropriate PPE.
 - .5 All workers will be instructed and trained on the hazards associated with work they will perform and how to protect themselves. This will include a review of all safe work practices, the reporting and documentation of hazards, reporting accidents and injuries as well as, formal training in areas of high risk (i.e. fall protection, power line hazards, traffic control persons training).
 - .6 The work site shall have the appropriate number of persons trained in emergency and Standard First Aid according to the First Aid Regulations.

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 Compensation Commission and Municipal Authority provided that in any case of conflict or discrepancy more stringent requirements shall apply.

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- .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 Specific Health and Safety Plan.
- .3 Provide Departmental's Representative with copies of all orders, directions and any other documentation, issued by the Occupational Health and Safety Branch, Services NL, 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 Departmental's Representative.

1.14 HEALTH AND SAFETY MONITORING

- .1 Periodic inspections of the contractor's work may be carried out by the Departmental's Representative 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 Occupational Health and Safety Branch, Services NL 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 Site Specific Health and Safety 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 Departmental's Representative.
- .2 Provide Departmental's Representative with written report of action taken to correct non-compliance of health and safety issues identified within ten (10) working days.
- .3 Departmental's Representative may stop work if non-compliance of health and safety regulations is not corrected.

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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 Departmental's Representative. 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. All MSDS should be located in accessible locations for all workers and visitors throughout the site, bound and organized in binders.
- .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 and WHMIS.
- .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 The Contractor's Full Time CSO and/or Site Superintendent shall 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, inspect, operate, modify, and dismantle scaffolding in accordance with CSA Z797, the OH&S Act and Regulations, and the scaffold manufacturer's written instructions.

- .2 Provide trained and certified Competent Scaffold Erectors for all scaffold erection, modification and dismantling. Training certification must be valid at time of erection, modification and dismantling of scaffold.
- .3 Conduct and document daily inspections of scaffolding by trained and certified Competent Scaffold Inspectors or Erectors. Training certification must be valid at the time of inspection.
- .4 Provide a scaffold tagging system as described in CSA Z797.
- .5 Ensure that all industry best practices for safe scaffold usage, including fall protection, proper loading, safe access, electrical hazards, exit door management and other concerns are strictly adhered to.

1.21 WORKING AT HEIGHTS

- .1 Ensure that fall restraint or fall arrest devices are used by all workers working at elevations greater than 3.05 meters above grade or floor level in accordance with CSA Z259, where alternate fall protection systems are not provided in accordance with Occupational Health and Safety Act and Regulations.
- .2 All workers performing work at height and who will be required to utilize a fall arrest system must be trained in a fall protection program certified by the WHSCC. Training must be current and valid at the time of use.
- .3 Prior to working at height workers shall be instructed in a Contractor Safe Work Practice for working at height and associated Rescue Plan for working at heights, developed specific to the work to be performed, locations and risks.

1.22 PERSONAL PROTECTIVE EQUIPMENT

- .1 Ensure workers on the jobsite use personal protective equipment appropriate to the hazards identified in the Site Specific Health and Safety 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. PPE must also be fitted for the worker.
- .3 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.
- .4 Provide workers and up to five (5) visitors to the site with CSA approved hard hats meeting the CSA Z94.1.

- .5 Provide high visibility apparel as defined in Occupational Health and Safety Regulations.
- .6 Provide CSA approved safety boots meeting CSA Z195.
- .7 Provide other personal protective equipment, as may be required by the owner, depending on duties being performed.

1.23 CONFINED SPACE WORK

- .1 Comply with the Newfoundland and Labrador Occupational Health and Safety Regulations.
- .2 Ensure a hazard assessment has been conducted related to the confined space and the work to be performed within the space.
- .3 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.
- .4 Ensure all required PPE is provided to the workers and workers are trained in its use, care and selection.
- .5 Develop a confined space entry (CSE) 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. This shall include training on the CSE permit system, rescue plan, testing, communication equipment and all equipment and safe work procedures conducted in and around the confined space.
 - .1 Ensure that personal protective equipment and emergency rescue equipment appropriate to the nature of the work being performed is provided and used.
- .6 Provide and maintain training of workers through a provider certified by the WHSCC.
- .7 Provide Departmental’s Representative with a copy of an “Entry Permit” for each entry into the confined space to ensure compliance Provincial Legislation.

1.24 HAZARDOUS MATERIALS

- .1 Should material resembling hazardous materials (e.g. asbestos/mould) not previously identified/documentated be encountered during the execution of work, stop work and notify Departmental’s Representative. Do not proceed until written instructions have been received from Departmental’s Representative.
- .2 Unless otherwise noted the services of a recognized Environmental Consultant to provide all air monitoring and testing services required by regulatory requirements for hazardous materials abatement and repair.

1.25 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 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

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 Departmental's Representative. Do not proceed until written instructions have been received from Departmental's Representative. 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 Departmental's Representative. Do not proceed until written instructions have been received from Departmental's Representative.

1.3 **BUILDING SMOKING ENVIRONMENT**

- .1 Comply with smoking restrictions.

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 Departmental's Representative and await Departmental's Representative's written instructions before proceeding with work in this area.
- .3 Relics, antiquities and items of historical or scientific interest remain Government of Canada property.

PART 2 **PRODUCTS (NOT APPLICABLE)**

PART 3 **EXECUTION (NOT APPLICABLE)**

PART 1 **GENERAL**

1.1 **RELATED DOCUMENTS**

- .1 Drawings and general provisions of this contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

1.2 **INDUSTRY STANDARDS**

- .1 Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made part of the Contract Documents by reference.
- .2 All construction industry standards referenced in this specification to meet the edition of the standard referenced by the National Building Code of Canada (NBC). If the construction industry standard is not referenced in the National Building Code of Canada (NBC), the latest edition of the standard shall apply.
- .3 Each entity engaged in construction on this Project must be familiar with construction industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Construction Documents.
 - .1 Where copies of construction industry standards are needed to perform a required construction activity, obtain copies directly from publication source and make them available upon request.

1.3 **ABBREVIATIONS AND ACRONYMS FOR INDUSTRY ORGANIZATIONS**

- .1 Where abbreviations and acronyms are used, they shall mean the recognized name of the entities in the following list. Names are believed to be accurate and up-to-date as of the date of the Contract Documents.
- .2 Industry Organizations:
 - .1 Air Conditioning and Mechanical Contractors Association (AMCA).
 - .2 Air Conditioning and Refrigeration Institute (ARI).
 - .3 Air Movement and Control Association (AMCA).
 - .4 American National Standards Institute (ANSI).
 - .5 American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE).
 - .6 American Society of Mechanical Engineers (ASME).
 - .7 American Welding Society (AWS).
 - .8 Canada Green Building Council (CaGCB).
 - .9 Canada Labour Code.
 - .10 Canadian Environmental Protection Act (CEPA).

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- .11 Canadian Standards Association (CSA).
- .12 Department of Justice Canada (Jus).
- .13 Electrical and Electronic Manufacturers' Association of Canada (EEMAC).
- .14 Environment Canada (EC).
- .15 Health Canada - Workplace Hazardous Materials Information System (WHMIS).
- .16 Hydraulics Institute (HI).
- .17 Institute of Electrical and Electronics Engineers (IEEE).
- .18 Institute for Research in Construction (IRC).
- .19 Insulated Cable Engineers Association (ICEA).
- .20 International Standards Organization (ISO).
- .21 National Energy Code of Canada for Buildings (NECB).
- .22 National Building Code of Canada (NBC).
- .23 National Bureau of Standards/Products Standard (NBS/PS).
- .24 National Electrical Manufacturers Association (NEMA).
- .25 National Environmental Balancing Bureau (NEBB).
- .26 National Fire Code of Canada (NFC).
- .27 National Fire Protection Association (NFPA).
- .28 National Research Council Canada (NRC).
- .29 Newfoundland Occupational Health and Safety Act.
- .30 Plumbing and Drainage Institute (PDI).
- .31 Province of Newfoundland and Labrador Building Accessibility Regulations.
- .32 Sheet Metal and Air Conditioning Contractors' National Association (SMACNA).
- .33 Transport Canada (TC).
- .34 Treasury Board of Canada (TB).
- .35 Underwriters' Laboratories Inc. (UL).
- .36 Underwriter's Laboratories of Canada (ULC).

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 Mock-ups.
- .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 Departmental's Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental's Representative 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 Departmental's Representative 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, Departmental's Representative shall pay cost of examination and replacement.

1.4 **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.

1.5 **PROCEDURES**

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

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Section 01 45 00 – Quality Control

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- .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.

1.6 REJECTED WORK

- .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental's Representative 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 Departmental's Representative 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 Departmental's Representative.

1.7 REPORTS

- .1 Submit 3 copies of inspection and test reports to Departmental's Representative, 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.

1.8 EQUIPMENT AND SYSTEMS

- .1 Submit adjustment and balancing reports for mechanical and building equipment systems.
- .2 Mechanical – coordinate with mechanical division.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

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Section 01 56 00 Temporary Barriers and Enclosures

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PART 1 GENERAL

1.1 SECTION INCLUDES

- .1 Barriers.

1.2 INSTALLATION AND REMOVAL

- .1 Provide temporary controls in order to execute Work expeditiously.
- .2 Remove from site all such work after use.

1.3 GUARD RAILS AND BARRICADES

- .1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs.
- .2 Provide as required by governing authorities.

1.4 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Be responsible for damage incurred.

1.5 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 Departmental's Representative 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)

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 Departmental's Representative based upon requirements of Contract Documents.
- .4 Within seven (7) working days of written request by Departmental's Representative, 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,

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.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 Departmental's Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of work.

.2 In event of failure to notify Departmental's Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental's Representative 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 Remove and replace damaged products at own expense and to satisfaction of Departmental's Representative.

.4 Touch-up damaged factory finished surfaces to Departmental's Representative 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.

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- .2 Notify Departmental's Representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental's Representative may establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental's Representative 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 Departmental's Representative if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. Departmental's Representative reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental's Representative, 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 all new conduits, pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.
- .2 Before installation, inform Departmental's Representative if there is interference. Install as directed by Departmental's Representative.

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 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-

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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 Departmental's Representative's approval before using explosive actuated fastening devices. If approval is obtained comply with CSA Z166.

1.14 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.

1.15 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 Departmental's Representative.

1.16 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 Departmental's Representative 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 Departmental's Representative and confirm findings in writing.

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- .5 Remove abandoned services lines within 2m of structures. Cap or otherwise seal lines at cut-off points as directed by Departmental's Representative.

1.17 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 Departmental's Representative 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 Departmental's Representative, obtain from manufacturer an independent laboratory reporting, showing that material or equipment meets or exceeds the specified requirements.

1.18 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. Departmental's Representative will inform all prospective bidders of decision by addendum, issued at least 5 days prior to the tender closing date.
- .2 **After Contract award** substitutions of material or equipment, other than as selected by Contractor from those specified, will be considered by Departmental's Representative 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

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- .3 alternative material or equipment to those specified, provided they are determined by the Departmental's Representative to be equivalent to or better than 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 Departmental's Representative and the Contract amount will be reduced accordingly.

PART 2 **PRODUCTS (NOT APPLICABLE)**

PART 3 **EXECUTION (NOT APPLICABLE)**

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Section 01 73 00 – Execution

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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.

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- .5 Provide protection from elements for areas which may be exposed by uncovering work; maintain excavations free of water.
- .6 Obtain Departmental's Representative's approval before cutting, boring or sleeving load-bearing members.

1.5 EXECUTION

- .1 Execute cutting, fitting, and patching to complete Work.
- .2 Fit several parts together, to integrate with other Work.
- .3 Uncover Work to install ill-timed Work.
- .4 Remove and replace defective and non-conforming Work.
- .5 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, 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, conduits, 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.

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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

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Section 01 74 11 – Cleaning

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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.

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 Departmental Representative 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 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .7 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

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.

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- .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 Departmental's Representative. Do not burn waste materials on site.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Leave the work broom clean before the inspection process commences.
- .8 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .9 Clean equipment to a sanitary condition; clean or replace filters of mechanical equipment.

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

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PART 1 GENERAL

1.1 SECTION INCLUDES

- .1 Text, schedules and procedures for systematic Waste Management Program for construction, deconstruction, demolition, and renovation projects, including:
 - .1 Diversion of Materials.
 - .2 Waste Audit (WA) - Schedule A.
 - .3 Waste Reduction Workplan (WRW) - Schedule B.
 - .4 Demolition Waste Audit (DWA) - Schedule C.
 - .5 Cost/Revenue Analysis Workplan (CRAW) - Schedule D.
 - .6 Materials Source Separation Program (MSSP).
 - .7 Canadian Governmental Responsibility for the Environment Resources - Schedule E.

1.2 DEFINITIONS

- .1 Demolition Waste Audit (DWA): Relates to actual waste generated from project.
- .2 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.
- .3 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.
- .4 Recycle: Process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .5 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.
- .6 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.
- .7 Salvage: Removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
- .8 Separate Condition: Refers to waste sorted into individual types.

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- .9 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.

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

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 Departmental's Representative.

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.

3.3 DIVERSION OF MATERIALS

- .1 From following list, separate materials from general waste stream and stockpile in separate piles or containers, as reviewed by Departmental's Representative and consistent with applicable fire regulations.
 - .1 Mark containers or stockpile areas.

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- .2 Provide instruction on disposal practices.
- .2 On-site sale or distribution of salvaged materials to third parties is not permitted.

END OF SECTION

PART 1 **GENERAL**

1.1 **RELATED SECTIONS**

- .1 Section 01 74 11 - Cleaning.
- .2 Section 01 78 00 - Closeout Submittals.

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 Departmental's Representative in writing of satisfactory completion of the Contractor's Inspection and that corrections have been made. Request a Departmental's Representative's Inspection.
- .2 Departmental's Representative's Inspection: Departmental's Representative 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 Operation of systems have been demonstrated to Departmental's personnel.
 - .5 Work is complete and ready for Final Inspection.
- .4 Final Inspection: When items noted above are completed, request final inspection of Work by the Departmental's Representative and the Contractor. If Work is deemed incomplete by the Departmental's Representative, complete outstanding items and request a reinspection.
- .5 Declaration of Substantial Performance: When the Departmental's Representative 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 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 Departmental's Representative 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

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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 Departmental's Representative 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 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.

1.2 **RELATED SECTIONS**

- .1 Section 01 33 00 – Submittal Procedures.
- .2 Section 01 45 00- Quality Control.
- .3 Section 01 77 00 - Closeout Procedures.

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 Departmental's Representative'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 Departmental's Representative, 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 Division 01.

1.6 AS-BUILTS AND SAMPLES

- .1 In addition to requirements in General Conditions, maintain at the site for Departmental's Representative one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to the Contract.
 - .5 Reviewed shop drawings and product data.
 - .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 available for inspection by Departmental's Representative.

1.7 RECORDING ACTUAL SITE CONDITIONS

- .1 Record information on set of blue line opaque drawings, provided by Departmental's Representative.
- .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 locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .2 Field changes of dimension and detail.
 - .3 Changes made by change orders.
 - .4 Details not on original Contract Drawings.
 - .5 References to related shop drawings and modifications.
- .5 Specifications: legibly mark each item to record actual construction, including:

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- .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. Transfer recorded information to AutoCAD 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 updated panelboard directories to reflect all changes during construction.
- .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 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- .9 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.
- .10 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .11 Include test and balancing reports
- .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 Departmental's Representative. 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 Departmental's Representative. 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 Departmental's Representative. 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 Departmental's Representative.

1.14 WARRANTIES

- .1 Provide copy of warranty and include in Operation and Maintenance Manuals.

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 O&M – Operation and Maintenance.
 - .4 PV – Performance Verification.
 - .5 GC – General Contractor
 - .6 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.

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- .4 Section 01 91 33 - Commissioning (Cx) Forms.
- .5 Section 01 91 41 - Commissioning (Cx) Training.

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 occupancy. The process focuses upon verifying and documenting that the facility and all of its systems 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.
- .6 Take responsibility to:
 - .1 Review the Cx manual with the commissioning team.
 - .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.
 - .7 Update the documentation manuals prior to each project meeting.
- .7 The Substantial Completion Certificate will not be issued until the commissioning process is completed and the final reports and commissioning documentation are received.
- .8 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 Department Representative(s):
 - .1 Construction Manager (CM).
 - .2 Project Coordinator (PC).
 - .3 Engineer/Architect/Consultant (AE).
 - .4 Technical Services Inspectors (TSI).
 - .2 User Representatives/Owner.
 - .3 General Contractor (GC):
 - .1 Mechanical 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 CM.
 - .2 Records all comments as history for the project commissioning.
 - .3 Produces the Commissioning Manual for review by the CM and DC, and modifies based on their comments as necessary.
 - .4 Provides “Issued for Construction” Commissioning Manual to the CM.
 - .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.

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- .17 Verifies that seasonal or deferred Commissioning is completed.
- .18 Coordinates ten (10) month building review and issues occupant survey.

- .2 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 Departmental 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.

- .3 BM (Building Manager):
 - .1 Reviews the Basis of Design developed by the DC and provides comments to the CM.
 - .2 Reviews all design documents and provides comments to the CM.
 - .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.

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- .8 Attends commissioning meetings as necessary.

- .4 GC (General Contractor):
 - .1 Maintains as-built drawings on site during construction.
 - .2 Submits shop drawing in accordance with the specifications.
 - .3 Ensures the Cx Manual is on site and being completed and kept up to date by all sub-trades.
 - .4 Executes the Cx process ensuring that sub-trades perform their responsibilities and integrate Cx into the construction process.
 - .5 Ensures equipment manufacturers and vendors provide documentation to facilitate the Commissioning work and perform startups.
 - .6 Coordinates and schedules Cx activities, submits schedule for review and comment by TW staff.
 - .7 Conducts Installation Verification and signs off checklists.
 - .8 Provides written confirmation all systems are operational prior to start of Performance Verification.
 - .9 Conducts Performance Verification with all required Commissioning Team members present.
 - .10 Ensures that all required personal are available for the verification.
 - .11 Maintains an up to date version of the Cx manual on site with checklists completed on installed/operational systems.
 - .12 Provides all required training.
 - .13 Coordinates location, schedule.
 - .14 Provides facilities (location, materials).
 - .15 Ensures qualified factory trained technicians are available to facilitate training.
 - .16 Provides copies of all training material.
 - .17 Obtains occupancy approvals/permits.
 - .18 Submits completed manual to CM.
 - .19 Provides the following information for inclusion in the Commissioning Summary Report.
 - .20 Training Records.
 - .21 Operation and Maintenance Manuals.
 - .22 Warranties.
 - .23 Completed commissioning Checklists.
 - .24 List of spare parts turned over.
 - .25 Supplies maintenance materials and tools as per specification.
 - .26 Attends all commissioning meetings.

- .5 PC (Project Coordinator):
 - .1 If there is no PC assigned to the project, then these duties are completed by the CM.

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- .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.
- .6 TSI (Technical Services Inspector):
- .1 Attends Installation Verification and Performance Verification for equipment within their discipline.
 - .2 Signs off on commissioning checklists within their discipline.
 - .3 Attends training sessions as necessary and directed by the CM.
 - .4 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 CM.
 - .2 Produces the Basis of Design and submits to the CM 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 CM.
 - .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.

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- .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 Develops and submits 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 CM.
- .2 Reviews the Basis of Design developed by the DC and provides comments to the CM.
- .3 Reviews all design documents and provides comments to the CM.
- .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.

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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 start-up documentation to CxA for review.
 - .2 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.

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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:

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- .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.
- .2 Contractor to provide and have available at time of commissioning excess fuel to test tank overflow alarm. Once testing has been completed the contractor shall be responsible to remove excess fuel from the tank in order to satisfy alarm condition

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:

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- .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.

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- .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 Notify CxA at least twenty eight (28) days prior to start of Performance Verifications.
- .2 Start Performance Verification after elements of building affecting start-up and performance verification of systems have been completed.
- .3 Conduct performance verification once identified pre-requisite activities are completed for a system and approved by the CxA.

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- .4 Test all new building systems including mechanical and electrical components and operating procedures by challenging these systems to realistic operating conditions and train operational staff.
- .5 Run systems through all sequences of operation and verify response of components.
- .6 Notwithstanding all-inclusive requirements specified in this section, additional separate commissioning may be required at a later date for equipment and systems whose full operation is dependent on seasonal conditions. Job conditions for Peak Performance Verification are as follows:
 - .1 Summer sequence commissioning to take place between June 1st and September 15th when outside ambient temperatures are at least 22°C;
 - .2 Winter sequence commissioning to take place between November 1st and March 31st when outside ambient temperature is no greater than minus 10°C.
- .7 Carry out Cx:
 - .1 Under actual operating conditions, over entire operating range, in all modes.
 - .2 On independent systems and interacting systems.
- .8 Cx procedures to be repeatable and reported results are to be verifiable.
- .9 Follow equipment manufacturer's operating instructions.

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 If the CxA is not available to witness, the certificates of approval from the Authority Having Jurisdiction will be accepted as adequate.
- .3 Obtain certificates of approval, acceptance and compliance with rules and regulation of authority having jurisdiction.
- .4 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.

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.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 Evaluation of operating condition of the systems at the time of functional test completion.
 - .2 Deficiencies that were discovered and measures taken to correct them.
 - .3 Functional test procedures and results.
 - .4 Documentation of all commissioning field activities as they progressed.
 - .5 Description and estimated schedule of required deferred testing.
- .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.

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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.

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 CxA will develop and provide to the contractor the required project specific Cx Manual which will include the Installation Verification check lists.
- .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 CxA will develop and provide to the Contractor the required project specific Cx Manual including the Performance Verification check lists.
- .2 Completed Performance Verification Checklists to be submitted to CxA for review and approval.
- .3 Strategy for Use:

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- .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 Verify operation in specified normal and emergency modes and under specified load conditions.
 - .5 Record analytical and substantiating data.
 - .6 Verify reported results.
 - .7 Form to bear signatures of recording technician and reviewed and signed off by General Contractor, Installing Contractor, Consultant, DTW Representative, and the Commissioning Agent.
 - .8 Reported results in true measured SI (metric) unit values.
 - .9 Maintain copy on site during start-up, testing and commissioning period.
 - .10 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.

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- .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.

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- .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

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PART 1 **GENERAL**

1.1 **OUTLINE OF WORK**

- .1 Comply with the requirements of this Section when performing the following work:
 - .1 Removing Aboveground Storage Tank Systems Containing Petroleum Products and Allied Petroleum Products.
 - .2 Contractor is to account for tanks being 75% full when bidding, planning and executing the project.

1.2 **REFERENCES**

- .1 Canadian Federal Legislation
 - .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
 - .1 Storage Tank System for Petroleum Products and Allied Petroleum Products Regulations, 2008, SOR/2008-197.
 - .2 Canadian Environmental Assessment Act (CEAA), 1992, c. 37.
 - .3 Canada Labour Code (R.S. 1985, c. L-2).
- .2 Transport Canada (TC).
 - .1 Transportation of Dangerous Goods Act, (TDGA).
- .3 National Research Council/Institute for Research in Construction.
 - .1 NRCC 38727, National Fire Code of Canada (NFC).
- .4 Canadian Council of Ministers of the Environment (CCME).
 - .1 CCME PN 1326, Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum Products and Allied Petroleum Products.
 - .2 CCME PN 1299, Canadian Environmental Quality Guidelines.
- .5 Underwriters' Laboratories of Canada (ULC).
 - .1 ULC/ORD-C142.23, Aboveground Waste Oil Tanks.
 - .2 ULC-S601, Shop Fabricated Steel Aboveground Horizontal Tanks for Flammable and Combustible Liquids.
 - .3 ULC-S602, Aboveground Steel Tanks for Fuel Oil and Lubricating Oil.
 - .4 ULC-S652, Tank Assemblies for Collection of Used Oil.
- .6 Canadian Standards Association
 - .1 CSA-B139 Series: 19, Installation Code for Oil Burning Equipment.
- .7 American National Standards Institute (ANSI).
 - .1 ANSI/NFPA-329, Handling Underground Releases of Flammable and Combustible Liquids.
 - .2 ANSI/API 650, Welded Steel Tanks for Oil Storage.

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- .8 American Petroleum Institute (API).
 - .1 API STD 653, Tank Inspection, Repair, Alteration, and Reconstruction.
- .9 Province of Newfoundland and Labrador
 - .1 Storage and Handling of Gasoline and Associated Products Regulations.

1.3 SUBMITTALS

- .1 Provide Departmental Representative with documented plan for removal of tanks before executing work. Plan to conform to all jurisdictional and environmental regulations.
- .2 Provide Departmental Representative with copy of vapour removal test results in accordance with Division 01.
- .3 Provide Departmental Representative with proof of fuel/sludge disposal and tank, including photos.

1.4 QUALITY ASSURANCE

- .1 Contractor and workers must be licensed by TSSA for removal of underground storage tanks.
 - .1 Regulatory Requirements: ensure Work is performed in compliance with TDGA, the Technical Standards and Safety Act 2000, and other applicable Provincial statutes and regulations.

1.5 CONTRACTORS RESPONSIBILITY

- .1 Be familiar with the regulations, codes and standards of Federal, Provincial and local Authorities which dictate the procedures for excavating and disposing of fuel tanks, tank contents and contaminated soils and materials.
- .2 Ensure that employees and sub-contractors know and understand all governing codes and regulations prior to their start of work.
- .3 Be responsible for any actions taken by authorities to remediate conditions caused by improper procedures, including hauling and dumping.

1.6 SPILL REPORTING

- .1 Contractor must follow the site EERP (Environmental Emergency Response Plan) provided by DFO that includes spill reporting procedures specific to a federal site.
- .2 Contractor to request EERP upon award of project.
- .3 Additional guidelines to be followed which may be superseded by the EERP:

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- .1 Leaking tanks are to be treated as an emergency with the potential of fire and explosion.
- .2 Take any measures necessary and as directed by the authorities having jurisdiction to stop and contain the spill.
- .3 Notify the Departmental Representative immediately upon the discovery or suspicion of possible leakage.
- .4 Notify the authority having jurisdiction immediately and provide the information requested.
- .5 Keep a log book detailing all measures.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION

3.1 PREPARATION SAFETY AND SECURITY

- .1 Conform to or exceed Federal and Provincial codes, local municipal by-laws, and codes and regulations of utility authorities having jurisdiction.
- .2 Prior to commencement of tank removal work, the following shall be completed:
 - .1 Provide temporary protection for safe-movement of personnel and traffic.
 - .2 Disconnect or remove all sources of ignition near the tank.
 - .3 Cut metal only in monitored areas established to be free of ignitable vapour concentrations. Do not proceed with hot metal work without approval of Departmental Representative.
 - .4 Ground and bond metal equipment, including tanks and transfer pipes, before operating equipment or transferring flammable materials.
 - .5 Use non-sparking tools and intrinsically safe electrical equipment.
 - .6 Smoking is not permitted.
 - .7 Implement any additional precautions necessary to safeguard personnel or building users in or near the job site.

3.2 REMOVAL OF TANK CONTENTS

- .1 Tank and piping contents shall be removed as thoroughly as practical.
- .2 Drain and flush piping liquid into tanks and clear any product that may be left in lines. Remove tank contents and tank flush water in accordance with governing regulations.
- .3 Dispose of fuel product, waste tank water and waste tank sludge in accordance with local and provincial regulations.

3.3 EXPLOSIVE VAPOUR REMOVAL

- .1 Use one of the following methods for purging explosive vapours from both tanks and all connected piping.
 - .1 Inversion
 - .1 Displace oxygen to levels below necessary to sustain combustion using carbon dioxide gas.
 - .2 Verify with combustible gas meter.
 - .2 Dry Ice
 - .1 Add 1.85 gm of solid carbon dioxide (dry ice) for each 100 litre capacity.
 - .2 Crush and distribute ice evenly over greatest area to secure rapid evaporation. Avoid skin contact.
 - .3 Verify dry ice has vapourized.
 - .4 Verify with combustible gas meter.
- .2 Combustible Vapour Target: purge vapours to less than 6% of lower explosive limit (LEL) as verified using a combustible gas meter prior to excavation.
- .3 Precautions shall be exercised with the displaced vapours to avoid ignition and to safeguard personnel in area of adverse health effects.

3.4 EXCAVATION AND REMOVAL OF BURIED TANKS

- .1 Disconnect piping at the tanks. Remove and dispose of all fill piping including overflow valves, grade-level spill containers, and grade-level fill pipe boxes. Remove and dispose of all vent piping including the vent risers. Plug all openings in both tanks except for one (1) vent opening for each tank. Install existing vent weather hoods removed from the vent risers along with a threaded steel pipe nipple and other fittings as needed onto each tank.

3.5 FUEL PRODUCT PIPING TRENCH

- .1 Remove and dispose of sacrificial anode test station and all associated wire.
- .2 Remove and dispose of any fuel product piping, including any valves and other fittings.

3.6 SECURING AND REMOVAL FROM SITE

- .1 Check explosive vapour levels in both tanks and all piping prior to transport.
 - .1 Remove explosive vapours if required.
- .2 Dispose of both tanks and all fuel piping in accordance with local, Provincial and Federal regulations.
- .3 Fuel tank removals:
 - .1 Secure tanks for disposal off the island and transport to disposal site. Where choppers are used, perform work in accordance with governing regulations.
 - .2 Cut suitable openings in both ends of both tanks to render each tank unusable.

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- .4 Dispose of tanks, piping, sumps and all other tank-related appurtenances in accordance with regulations.

Report. Photograph excavation prior to backfilling and provide photographs to the Departmental Representative.

3.7 SITE FINISHING

- .1 Contractor is responsible for the complete restoration of the site.

END OF SECTION

PART 1 **GENERAL**

1.1 **RELATED SECTIONS**

- .1 Section 01 74 11 – Cleaning.
- .2 Section 01 74 21 – Construction / Demolition Waste Management and Disposal

1.2 **WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal, paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Divert unused metal materials from landfill to metal recycling facility approved by Departmental's Representative.

1.3 **QUALITY ASSURANCE**

- .1 Installers to be certified to journeyperson.

PART 2 **PRODUCTS (NOT USED)**

PART 3 **EXECUTION**

3.1 **CONNECTIONS TO EQUIPMENT**

- .1 In accordance with manufacturer's instructions unless otherwise indicated.
- .2 Use valves and either unions or flanges for isolation and ease of maintenance and assembly.
 - .1 Unions are not required in installations using grooved mechanical couplings (The couplings shall serve as unions).
- .3 Use double swing joints when equipment mounted on vibration isolation and when piping subject to movement.
- .4 The flexible type grooved joint couplings may be used in lieu of a flexible connector at equipment connections for vibration attenuation and stress relief. Couplings shall be placed in close proximity to the source of the vibration, as per manufacturer's recommendations.

3.2 CLEARANCES

- .1 Provide clearance around systems, equipment and components for observation of operation, inspection, servicing, maintenance and as recommended by manufacturer.
- .2 Provide space for disassembly, removal of equipment and components as recommended by manufacturer or as indicated (whichever is greater) without interrupting operation of other system, equipment, components.

3.3 PIPEWORK INSTALLATION

- .1 Installation by certified journeyman.
- .2 Protect openings against entry of foreign material.
- .3 Slope piping, except where indicated, in direction of flow for positive drainage and venting.

3.4 EXISTING SYSTEMS

- .1 Connect into existing piping systems at times approved by Departmental's Representative. Work to be coordinated with DFO Representative/Owner.
- .2 Request written approval ten (10) working days minimum, prior to commencement of work.
- .3 Be responsible for damage to existing plant by this work.
- .4 Ensure daily clean-up of existing areas.

END OF SECTION

PART 1 **GENERAL**

1.1 **SUMMARY**

- .1 Section includes:
 - .1 Materials and installation for light fuel oil piping from oil tanks to boilers or engines.

1.2 **RELATED SECTIONS**

- .1 Section 01 33 00 – Submittal Procedures.
- .2 Section 01 45 00 – Quality Control.
- .3 Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
- .4 Section 01 78 00 - Closeout Submittals.
- .5 Section 23 05 05 – Installation of Pipework.
- .6 Section 33 56 13 – Aboveground Fuel Storage Tanks.

1.3 **REFERENCES**

- .1 American Society of Mechanical Engineers (ASME)
 - .1 ASME-B16.3, Malleable-Iron Threaded Fittings.
 - .2 ASME-B16.9, Factory-Made Wrought Steel Buttwelding Fittings.
- .2 American Society for Testing and Materials (ASTM)
 - .1 ASTM A47/A47M, Standard Specification for Ferritic Malleable Iron Castings.
 - .2 ASTM A53/A53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless.
 - .3 ASTM B61, Standard Specification for Steam or Valve Bronze Castings.
 - .4 ASTM B75M, Standard Specification for Seamless Copper Tube.
- .3 Canadian Standards Association (CSA)
 - .1 CAN/CSA-B139, Installation Code for Oil Burning Equipment.
 - .2 CAN/CSA-B140.0, General Requirements for Oil Burning Equipment.
- .4 Health Canada/Workplace Hazardous Materials Information Systems
 - .1 Material Safety Data Sheets (MSDS)
- .5 Manufacturers Standardization Society of the Valve and Fitting Industry (MSS)
 - .1 MSS-SP-80, Bronze Gate, Globe, Angle and Check Valves.

1.4 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 – Submittal Procedures
- .2 Product Data
 - .1 Submit manufacturer’s printed product literature, specifications and datasheet for piping, fittings and equipment.
 - .1 Indicate on manufacturer’s catalogue literature the following: valves
- .3 Submit WHMIS MSDS in accordance with Division 02. Indicate VOC’s for adhesive and solvents during application and curing.
- .4 Test Reports: submit certified test reports from approved independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties.
- .5 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .6 Instructions: submit manufacturer’s installation instructions.
- .7 Closeout submittals: submit maintenance and engineering data for incorporation into manual specified in Section 01 78 00 – Closeout Submittals

1.5 QUALITY ASSURANCE

- .1 Pre-Installation Meeting:
 - .1 Convene pre-installation meeting one week prior to beginning work of this Section and on-site installations.
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions
 - .3 Co-ordination with other building subtrades.
 - .4 Review manufacturer’s installation instructions and warranty requirements.
- .2 Health and Safety:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06– Health and Safety Requirements.
- .3 Trades people to have journeyman qualifications.

1.6 DELIVERY, STORAGE AND HANDLING

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

- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan (WMP).
- .4 Separate for reuse and recycling and place in designated containers, steel, metal, plastic waste in accordance WMP.
- .5 Place materials defined as hazardous or toxic in designated containers.
- .6 Handle and dispose of hazardous materials in accordance with Canadian Environmental Protection Act (CEPA), Transportation of Dangerous Goods Act (TDGA), Regional and Municipal regulations.
- .7 Divert unused metal materials from landfill to metal recycling facility as approved by Departmental's Representative.
- .8 Unused paint, coating materials must be disposed of at official hazardous material collection site as approved by Departmental's Representative.
- .9 Unused sealant materials must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

PART 2 **PRODUCTS**

2.1 **FILL, VENT AND CARRIER PIPE (ABOVE GROUND)**

- .1 Steel: to ASTM A53/A53M, Schedule 40, continuous weld or electric resistance welded, screwed.

2.2 **STEEL PIPE COATING**

- .1 Bituminous paint: in accordance with manufacturer's recommendations for exterior above ground or galvanized.

2.3 **JOINTING MATERIAL**

- .1 Screwed fittings: Teflon or pulverized lead paste. In accordance with manufacturers recommendations.

2.4 **FITTINGS**

- .1 Steel:
 - .1 Malleable iron: screwed, banded, Class 150 to ASME-B16.3.
 - .2 Unions: malleable iron, brass to iron, ground seat, screwed, to ASTM A47/A47M.
 - .3 Nipples: Schedule 40, to ASTM A53/A53M.

PART 3 **EXECUTION**

3.1 **PIPING**

- .1 Install oil piping system in accordance with CAN/CSA-B139 and CAN/CSA-B140.0.
- .2 Slope piping down in direction of storage tank unless otherwise indicated.

END OF SECTION

PART 1 **GENERAL**

1.1 **SUMMARY**

- .1 Section includes:
 - .1 Materials and installation for aboveground oil storage tanks.

1.2 **RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .3 Section 01 78 00 - Closeout Submittals.
- .4 Section 23 11 13 - Facility Fuel-Oil Piping.

1.3 **REFERENCES**

- .1 American National Standards Institute (ANSI).
 - .1 ANSI/NFPA-329, Handling Underground Releases of Flammable and Combustible Liquids.
 - .2 ANSI/API 650, Welded Steel Tanks for Oil Storage.
- .2 American Petroleum Institute (API).
 - .1 API STD 653, Tank Inspection, Repair, Alteration, and Reconstruction.
- .3 Canadian Council of Ministers of the Environment (CCME).
 - .1 CCME-PN1326, Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products.
- .4 Department of Justice Canada (Jus).
 - .1 Canadian Environmental Protection Act, (CEPA).
- .5 Canadian Standards Association (CSA)/CSA International.
 - .1 CAN/CSA-B139, Installation Code for Oil Burning Equipment.
- .6 National Research Council/Institute for Research in Construction.
 - .1 NRCC 38727, National Fire Code of Canada (NFC).
- .7 Transport Canada (TC).
 - .1 Transportation of Dangerous Goods Act, (TDGA).

- .8 Underwriters' Laboratories of Canada (ULC).
 - .1 ULC/ORD-C142.23, Aboveground Waste Oil Tanks.
 - .2 ULC-S601, Shop Fabricated Steel Aboveground Horizontal Tanks for Flammable and Combustible Liquids.
 - .3 ULC-S602, Aboveground Steel Tanks for Fuel Oil and Lubricating Oil.
 - .4 ULC-S652, Tank Assemblies for Collection of Used Oil.
- .9 Province of Newfoundland and Labrador
 - .1 Storage and Handling of Gasoline and Associated Products Regulations.

1.4 SUBMITTALS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate details of construction, appurtenances, installation, leakage detection system.
- .3 Shop drawings to detail and indicate following as applicable to project requirements. Submit manufacturer's product data to supplement shop drawings.
 - .1 Size, materials and locations of ladders, ladder cages, catwalks and lifting lugs.
 - .2 Tanks capacity.
 - .3 Size and location of fittings.
 - .4 Environmental compliance package accessories.
 - .5 Decals, type, size and location.
 - .6 Accessories: provide details and manufacturers product data.
 - .7 Size, material and location of manholes.
 - .8 Size, materials and locations of railings, stairs, ladders and walkways.
 - .9 Finishes.
 - .10 Electronic accessories: provide details and manufacturers product data.
 - .11 Insulation types, locations and RSI values.
 - .12 Identification, name, address and phone numbers of corrosion expert where applicable. Note: Grading drawings to be stamped by licenced corrosion expert.
 - .13 Piping, valves and fittings: type, materials, sizes, piping connection details, valve shut-off type and location.
 - .14 Spill containment: provide description of methods and show sizes, materials and locations for collecting spills at connection point between storage tank system and delivery truck, or vessel.
 - .15 Anchors: description, material, size and locations.
 - .16 Concrete: type, composition and strength.
 - .17 Size and location of site pads.
 - .18 Level gauging: type and locations, include:
 - .1 Reporting systems, types of reports and report frequency.

- .2 Maximum number of tanks to be monitored.
- .3 Number of probes required and sizes.
- .4 Provide details and manufacturer's product data.
- .19 Ancillary devices: provide details and manufacturer's product data.
- .20 Leak detection system, type and locations, and alarm system.
- .21 Grounding and bonding: provide details of design, type, materials and locations.
- .22 Corrosion protection: provide details of design, type, materials and locations.
- .23 Field-erected overfill-protection systems: provide details of design, type, materials and locations.
- .24 Containment system for spills, overfills and storm runoff water: provide details, materials used, and locations.
- 4 Provide maintenance data for tank appurtenances and leakage detection system for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of all packaging materials and appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Separate for reuse and recycling and place in designated containers Steel, Metal and Plastic waste in accordance with Waste Management Plan.
- .5 Place Materials defined as hazardous or toxic in designated containers.
- .6 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .7 Clearly label location of salvaged material's storage areas and provide barriers and security devices.
- .8 Ensure emptied containers are sealed and stored safely.
- .9 Divert unused metal materials from landfill to metal recycling facility as approved by Owner's Representative.
- .10 Divert unused concrete materials from landfill to local quarry facility as approved by Owner's Representative.

- .11 Dispose of unused paint or coating materials at an official hazardous material collections site as approved by Owner's Representative.
- .12 Do not dispose of unused paint, thinners, solvents, etc. into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.
- .13 Fold up metal banding, flatten and place in designated area for recycling.

PART 2 **PRODUCTS**

2.1 **ABOVE GROUND FUEL OIL STORAGE TANK (DOUBLE WALL)**

- .1 Provide packaged, factory fabricated and tested fuel oil storage tank, as specified, including double walled steel tank welded to steel support saddle, skid and transfer area spill pan.
- .2 Tank Construction:
 - .1 Horizontal cylindrical double walled (300°-360° secondary containment) fabricated and certified to ULC S 601.
 - .2 Material:
 - .1 6819 L Tank – Stainless Steel
 - .2 900 L Dwelling Tank – Stainless Steel
 - .3 900L Day Tank – Fibreglass Tank Construction
 - .3 Exterior coating: factory-applied, primer coat to CAN/CGSB-1.181 Ready Mix Organic Zinc-Rich Coating, two (2) coats of suitable corrosion resistant epoxy paint, and one (1) top coat of suitable polyurethane paint. Color as directed by owner.
 - .4 Fittings: vent opening c/w vent pipe (size and length as required) with 180° close bend, fill opening c/w fill tube, locking cap, and spill containment device, 50 mm diameter tapping for each suction, 50 mm for return, one 100 mm tapping for level gauge, one 100 mm diameter spare tapping (threaded and plugged), vacuum gauge tapping.
 - .5 Vacuum applied to interstitial space with vacuum gauge and pressure switch for connection to monitoring system.
- .3 Tank Support:
 - .1 Two steel support saddles welded to tank drilled for hold down anchor bolts.
 - .2 Tank mounted on skid.
- .4 Accessories:
 - .1 Access stairs/platform c/w handrail for filling and inspection of tanks.
 - .2 Spill containment device on fill pipe c/w locking 50 mm tight fill cap, collar and drain valve.

- .3 Level gauge: Type as indicated on the drawings complete with metal cover.
 - .4 Emergency vent device.
 - .5 Vacuum gauge (tank mounted) c/w switch.
 - .6 Dipstick and gauge chart. Dipstick to be tank mounted in lockable enclosure.
 - .7 Lifting lugs.
 - .8 Grounding lug.
 - .9 Pipe support bracket on end of tank.
 - .10 Overfill protection to CCME, see below.
 - .11 Fuel transfer area spill protection pan on ground under fill pipe.
- .5 Size: as indicated on drawings.
- .6 Anchored to concrete base with four anchor bolts.

2.2 GROUNDING AND BONDING

- .1 Reconnect existing grounding to tank. Provide additional wiring as needed.

2.3 ANTI-SIPHON VALVE

- .1 Automatic shut-off to prevent spillage in the event of line rupture, cast or ductile iron body, adjustable hydrostatic pressure, brass trim, corrosion-resistant steel spring, fluorocarbon seal, sized for application, built-in thermal expansion pressure relief valve.

2.4 FILL SIGNAL DEVICE

- .1 Vent whistle, whistles when tank is being filled and stops whistling when tank is full. Install on vent pipe at tank.

2.5 LEVEL GAUGING

- .1 Tank gauging stick to manufacturer's standard.
- .2 Manual level gauge type: pneumatic, hand-pump operated, accuracy 2%, dial selected to suit tank.

2.6 LEAKAGE DETECTION SYSTEM

- .1 To ANSI/NFPA 329.
- .2 Provide electrical power, wiring, controls to interface with existing alarm/strobe, and emergency shutoff of transfer pumps, Contractor to include all electrical, circuit, breaker etc and wiring to make good.
- .3 Leak detection sensors:
 - .1 Interstitial space vacuum monitoring.

- .2 Tank sensor: pressure sensor/switch for continuous monitoring of fuel tank interstitial space.

2.7 FUEL TRANSFER PUMP CABINET AND ASSEMBLY

- .1 150 LPM capacity, 120 V/1/60, equal to GPS M-3130-RDP.
- .2 Remote dispenser, litre calibration, digital meter equal to GPS MR5-30-RD.
- .3 Vacuum breaker equal to GPI M-3130-RDP.
- .4 Hose reel, 40 mm, 60 m long, motorized return.
- .5 Connect to existing emergency shutoff button on site.

PART 3 EXECUTION

3.1 INSTALLATION

- .1 Install tank(s) and all piping, fittings, accessories and associated systems in accordance with National Fire code of Canada, CCME – “Code of Practice”, CSA B139 (as applicable), provincial regulations and manufacturer’s recommendations.
- .2 Position tank(s) using lifting lugs and hooks, and where necessary use spreader bars. Do not use chain in contact with tank walls.
- .3 Provide all registrations and permits as required by Provincial regulations and as required by DFO.

3.2 FIELD QUALITY CONTROL

- .1 Test tank(s) for leaks to requirements of authority having jurisdiction and in presence of authority having jurisdiction.
- .2 Commissioning in accordance with Division 01.

3.3 TOUCH-UP

- .1 Where coating is damaged touch-up original coating material.
- .2 Shield capillary and tubing connections in heavy-duty 50 mm polyethylene pipe.
- .3 The cover for the reset, acknowledge controls.

3.4 LEVEL GAUGE SYSTEM

- .1 Provide leak and vapour proof caulking at connections.

- .2 Shield capillary and tubing connections in heavy-duty 50 mm polyethylene pipe.
- .3 Calibrate system.

3.5 LEAK DETECTION SYSTEM

- .1 Install in accordance with manufacturer's recommendations.

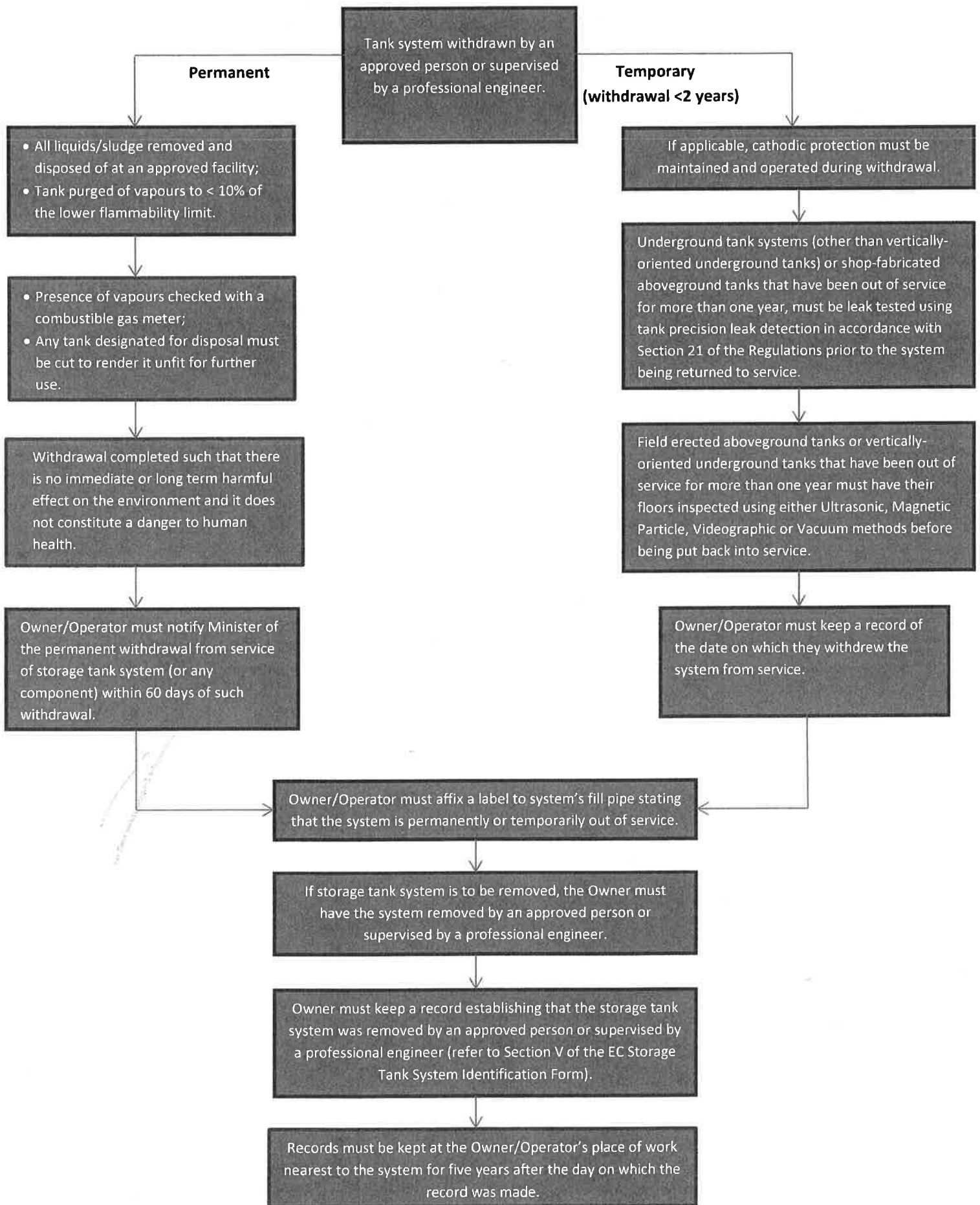
END OF SECTION

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Appendix "A"

Environment Procedure - Tank Withdraw Flowchart

Storage Tank System Withdrawal from Service and Removal Form

TANK WITHDRAWAL FLOWCHART





PART V: STORAGE TANK SYSTEM WITHDRAWAL FROM SERVICE AND REMOVAL
(Refer to Section 42-45 of Regulations)

*Owner's Tank System Identification Number:

EC Tank System Identification Number (One ID per system):

Tank and Piping Status:
NOTE: Permanent withdrawal and removal from service (must notify EC within 60 days)

		Tank 1	Tank 2	Tank 3	Tank 4	Tank 5
Owner's Tank Identification Numbers						
Components permanently withdrawn from service	Tank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Piping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Date(s): Permanently withdrawn from service (MM/DD/YYYY)	Tank					
	Piping					
Components removed from site (check all that apply)	Tank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Piping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Date(s): Removed from site and disposed of (MM/DD/YYYY)	Tank					
	Piping					

• Permanent Withdrawal Completed in Accordance with Section 42-44 of Regulations

	YES	NO
Withdrawn by approved person	<input type="checkbox"/>	<input type="checkbox"/>
Withdrawal records kept	<input type="checkbox"/>	<input type="checkbox"/>
Liquids/sludge removed and disposed of	<input type="checkbox"/>	<input type="checkbox"/>
Vapors purged	<input type="checkbox"/>	<input type="checkbox"/>
No long-term harmful effects	<input type="checkbox"/>	<input type="checkbox"/>
Fill pipe labeled	<input type="checkbox"/>	<input type="checkbox"/>

• Removal Completed in Accordance with Section 45 of Regulations

	YES	NO
Removed by approved person	<input type="checkbox"/>	<input type="checkbox"/>
Removal records kept	<input type="checkbox"/>	<input type="checkbox"/>

*Certification number of system remover:

*Additional Information:



Please note that all records related to the federal regulatory requirements, such as visual inspections and withdrawal and removal reports, must be kept for five years after the record was made.

PART VI: OWNER'S CERTIFICATION

This section must be signed by the storage tank system owner or the owner contact or it may sent electronically from or cc'd to the email address of the storage tank system owner or their delegated representative.

I hereby certify that the information provided with respect to the identification of tank system(s) under section 28 of the Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations is accurate and complete.

Name and Title (Type or Print)

Signature

_____/_____/_____

Date

Puffin Island Fuel Tank Replacement
Bonavista Bay, NL
PN: F6879-209223
Appendix "B"

Commissioning and Decommissioning of Prefab Building

Commissioning of building

1. Connect suction line to water tank
2. Close all drain valves in building.
3. Turn water valves to on position on water supply tank
4. Prime pump:
 - 4a. Open valve below funnel and fill pump with water.
 - 4b. Close valve below funnel.
5. Connect pump to power
 - 5a. Pump should build pressure and cut out on 50 PSI. If pump does not cut out at 50 PSI repeat step 4a and 4b.
6. Open water valves on to building to Pressurize water distribution system.
7. Turn water on to all sinks & check for leaks.
8. Fill hot water heater
9. Open hot water tap on a sink let run until all air is removed & water is flowing freely from hot water tap with no air left in line.
10. Turn breaker on too hot water heater
11. Water should be hot after a few hours – if not inspect hot water heater

Decommissioning of building

1. Disconnect power to pump and water boiler.
2. Open all drain valves.
3. Disconnect suction line between tank and building.
4. Drain hot water heater – open drain valve on bottom of the boiler.
5. Drain water tank by opening valve on bottom
6. Open all faucets
7. Remove plug from p-traps or use plumbing antifreeze in all traps

Maintenance

Pump:

Inspect yearly. Check air pressure in tank, adjust to 28lbs and check for leaks. During commissioning and decommissioning of building.

Toilet:

Refer to electrical O&M Manual (attached) electrician may be required to maintenance toilet.

Plumbing fixtures and faucets:

Inspect yearly. Checking for leaks, during commissioning and decommissioning of building.

Water heater:

Inspect yearly. Checking for corrosion and leaks, during commissioning and decommissioning of building.

***** Recommend*** change anodes rod once a year**

Puffin Island Fuel Tank Replacement
Bonavista Bay, NL
PN: F6879-209223
Appendix "C"

Covid-19 Protocols



Canadian
Construction
Association

COVID-19 - Standardized Protocols for All Canadian Construction Sites

Version 7
April 19, 2021

For inquiries: Contact Mary Ghobrial
at mghobrial@cca-acc.com

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COVID-19 - STANDARDIZED PROTOCOLS FOR ALL CANADIAN CONSTRUCTION SITES

The Standardized Protocols for All Canadian Construction Sites outlines the best practices for construction sites in order to maintain the health and safety of all workers required to perform duties during the COVID-19 crisis. The protocols, which include prevention, detection and response measures, will minimize the impacts of the crisis and ensure business continuity in the construction industry. This is not a legal document. Some provinces and municipalities have implemented stricter measures than those found in this document, and contractors are responsible for compliance with the rules, regulations and practices required by the applicable authorities. At the end of this document, there are links to information from some of our partner associations and other industry stakeholders that are further tailored to province specific requirements.

The objectives of the Standardized Protocols are to:

- Prioritize the health and safety of workers and of their surrounding communities;
- Apply recommendations and best practices from federal, provincial, and municipal public health authorities to construction site procedures;
- Establish and maintain a common COVID-19 Pandemic Response Plan across construction sites; and
- Foster open communication amongst stakeholders and ensure a respectful work environment.

Standardized Protocols for All Canadian Construction Sites

Prevention measures

Communication and awareness

- Clear signage is posted at entry points on the construction site and outline the commitment of the contractor to maintain health and safety measures during the COVID-19 crisis, with relevant updates from appropriate jurisdictions' public health authorities and self-identification screening tools.
- Worksite policies as they relate to the COVID-19 crisis are communicated to workers and made available on site.
- All workers exercise the following recommended practices for reducing the risk of transmission as identified by the Public Health Agency of Canada (PHAC), Health Canada, and Centers for Disease Control and Prevention, as well as provincial authorities:
 - o Avoid touching eyes, nose and mouth with unwashed hands;
 - o When coughing or sneezing:
 - Cough or sneeze into a tissue or the bend of your arm, not your hand;
 - Dispose of any tissues you have used as soon as possible in a lined waste basket and wash your hands afterwards;
 - o Clean and disinfect frequently touched objects and surfaces, including all reusable personal protective equipment (PPE);



- o Do not share personal items or supplies such as phones, pens, notebooks, tools, PPE, etc.;
- o Use and remove PPE with care, being mindful of which surfaces may be contaminated. Individuals must clean their hands after handling any used PPE;
- o Avoid common physical greetings, such as handshakes;
- o Maintain a minimum physical distance of two metres from others; and
- o Wash hands often with soap and water for at least 20 seconds after using the washroom, before handling food, after blowing nose, coughing, or sneezing, and before smoking. If hands are not visibly soiled, and soap and water are unavailable, alcohol-based hand sanitizer can be used.

Use of face masks

- All individuals on the site have facial respirators on hand at all times. N95 respirator masks, or the commercial-grade equivalent, should be worn as a potential mitigant to catching and transmitting the virus, but are not to be treated as substitutes for proper handwashing, physical distancing, and other protective measures. Masks should not be worn where they put an individual at risk (e.g. when it may get caught in machinery), however, physical distancing should be practiced in the alternative, whenever possible. Individuals working around an unmasked person without a shielding barrier should wear PPE.
- Such face masks are worn whenever individuals are:
 - o Unable to maintain two-metre distancing;
 - o Moving between zones, work areas, or other facilities;
 - o Indoors; or
 - o In non-open air environments or other areas with limited airflow.
- Individuals wash or sanitize their hands before and after applying, removing, or otherwise touching their face mask.
- Single-use facial respirators are disposed after use.

Business-related travel

- Non-essential business travel is not authorized. Business travel is limited and on an exceptional basis only.
- All individuals returning from out of country must undergo a 14-day self-isolation period, as mandated by the federal government and outlined here: Mandatory quarantine or isolation – [Travel restrictions in Canada – Travel.gc.ca](#).
- As some provincial governments impose similar restrictions for inter-provincial travel, any such requirements for self-isolation must be obeyed as applicable.

Working remotely

- Where practical, all office employees supporting a project work remotely. Meetings are held through teleconferencing or videoconferencing.
- Some provincial governments have imposed mandatory remote-working for employees, except for work that cannot be done remotely. Any such provincial requirements must be obeyed as applicable.



Access and movement to/from construction site

- Wherever possible, workers travel to site using individual modes of transportation (e.g., personal vehicle or bicycle). Additional parking arrangements are made as required.
- Whenever possible, workers should travel alone in their vehicles in order to practice physical distancing. Alternatively, the number of individuals inside a vehicle should be limited, and the number of trips should be increased to allow for physical distancing.
- If physical distancing within a vehicle cannot be respected, workers are encouraged to wear PPE.
- Workers are encouraged to change out of work clothes before entering their vehicle at the end of their shift. Work clothes should be handled carefully and washed upon arriving home.
- Entering and exiting of the worksite is monitored and controlled to ensure that the minimum physical distancing is not broken when shifts begin and end. Shift start and end times are staggered in five-minute intervals to accommodate this if needed.
- All non-essential individuals are not permitted access to the site.

Monitoring the status of workers

- Detailed tracking of worker's status on-site and off-site are kept at all times (e.g. fit to work, sick, off-work for family caring duties, etc.). A list of all quarantined workers is updated daily, with their privacy maintained.
- Records are kept of which individuals work together and when.
- Provide information, instruction, and supervision to workers to protect their health and safety.

Construction site and site trailer cleaning protocols

- All offices and jobsites implement additional cleaning measures of common areas. All door handles, railings, ladders, switches, controls, eating surfaces, shared tools and equipment, taps, toilets, and personal workstation areas are wiped down at least twice a day with a disinfectant, such as disinfectant wipes. Individuals are responsible for cleaning and disinfecting their workstations.
- Additional sanitary measures are implemented on site: hand washing stations with a posted hand washing protocol, hand sanitizer stations, provision of disinfectant wiping products. These types of facilities are made available at site entries, exits, washrooms, eating areas, offices, and any other areas with commonly touched surfaces.
- Commonly touched surfaces on vehicles and equipment are thoroughly cleaned and disinfected at the end of shifts and between users.
- All cleaning and disinfecting is carried out per PHAC's recommendations here: [COVID-19: Cleaning and disinfecting - Canada.ca](#).
- Offices and jobsites are also encouraged to develop a Cleaning and Disinfecting Program, as per CCOHS's recommendations at: [CCOHS: COVID-19 Health and Safety Resources](#).

Limiting and removing internal touch point areas

- Limit access and use of shared devices like coffee machines, water fountains, microwave ovens, and similar; and wash hands after handling such items. Means to clean and disinfect such devices between uses is to be provided.



- Limit use of common pens for sign-in sheets to construction sites. Supervisors are encouraged to sign-in for workers, or have workers sign-in through SMS, email, or other electronic means..
- Washroom modifications - Install more sinks and sinks with physical separation between users where feasible. Change out taps, paper towel dispensers and garbage cans to hands-free models.
- Remove doors/door handles - Look at all reasonable opportunities to remove doors or replace handles with hands-free options, such as foot-pull devices.
- Where touch points like door handles and water coolers remain, paper towels are provided to allow users to avoid skin contact.
- Gloves are worn whenever possible while on the worksite, but are treated the same as bare hands in terms of minimizing unnecessary touching of anything on site and the user's face.

Compartmentalization

- The construction site is to be segregated to the extent possible in zones or other methods to keep different crews/trades physically separated at all times. This promotes physical distancing and supports the containment of propagation should it arise.
- Eating is restricted to clearly identified dedicated eating areas with handwashing stations, cleaning and disinfectant materials, and adequate space to maintain minimum physical distancing.
- Upper limits are put on the number of people allowed in each zone and in facilities like washrooms, trailers, and eating areas at once to allow for the recommended minimum physical distancing.
- One-way staircases are established wherever practical to minimize worker contact.
- Freight elevators are operated/occupied by only one individual at a time or where feasible, by respecting the minimum physical distancing guidelines.

Working in close proximity

- Alternate arrangements are made as necessary to ensure workers avoid breaking the minimum physical distance with others for prolonged periods. Where this is not possible due to task-specific safety risks, a risk assessment is done to identify controls to protect the health and safety of workers. This can include methods to minimize the duration or proximity of the task, use of physical controls (such as the use of clear plastic barriers), and wearing of PPE.
- A record is kept of all tasks requiring close-proximity work, including the task-specific safety risks that justify close-proximity and all the control measures implemented to protect workers from the risk of infection. The record should be reviewed regularly to determine if there are any additional safety measures that can be implemented for each task.
- Whenever possible, allow for increased ventilation, including but not limited to keeping windows and doors open as much as possible, using portable ventilation fans, and continuing ventilation and air exchange after regular work hours.

Site operation

- The number of in person meetings is minimized. If required, meetings should involve only necessary individuals and include six people or fewer. Minimum physical distancing is maintained, and meetings are held in open



spaces when possible. If needed, 'Toolbox Talks' and similar meetings/updates are held in multiple sessions to accommodate this.

- The worksite is rearranged to reduce high-traffic areas and allow for the minimum physical distancing. Travel paths on worksites should be designated to account for physical distancing requirements.
- Site teams are encouraged to put forward split/alternating shifts to avoid extensive intermingling. Voluntary shift offset and implementing time gaps between shifts are highly encouraged.
- Vehicles, equipment, and tools are assigned to a single individual, or, to the minimum number of operators needed for safe use.
- Where work is done in crews, the work is planned to minimize or eliminate the crossover of workers between crews.
- Project teams stagger break and lunch schedules to minimize the number of people in close proximity to one another. Enclosed lunchrooms are only made available during inclement weather.
- Work schedules are adjusted to provide time for proper cleaning and disinfecting as required.

Deliveries

- Delivery zones are clearly identified and limited to receivers and deliverers only.
- When possible, nothing is passed between the deliverer and the receiver (e.g. shipment documents and pens for signatures). Deliveries are unloaded solely by receivers using proper PPE, while deliverers remain in their vehicles.

Work in occupied spaces

- When working in spaces currently occupied (e.g. private residences), the minimum physical distancing with any occupants is strictly enforced. Where possible, workers and occupants are segregated in different rooms.
- Non-emergency work should not be done in any occupied spaces where an occupant is suspected to have contracted COVID-19 or is under self-isolation (per the directions of the applicable authorities). Emergency work can be carried out provided workers are equipped with nitrile gloves, Tyvek suits or coveralls, and facial/respiratory protection.
- Hands and tools are thoroughly cleaned before entering the workplace and after leaving, and any surfaces or equipment in the occupied space are disinfected before work is done on them.

Protocol auditing

- The jobsite's safety officer is responsible for ensuring appropriate health and safety measures have been implemented, and that directions of the appropriate health authorities are followed with respect to workers returning to work following a presumed or confirmed case of COVID-19.
- Contractors are to conduct periodic audits (frequency to be determined based on project scale and scope) to verify that the appropriate measures have been implemented and are maintained.
- Display signage to reinforce health and safety policies and control measures on worksites.

Other

- Any other measures deemed to increase the safety or limit the propagation of the virus.



Detection measures

Screening at entry of construction site

- Before entering the site, individuals must confirm that:
 - o They are not currently exhibiting flu-like symptoms such as fever, tiredness, coughing, or congestion;
 - o They have not returned from outside of Canada within the past 14 days;
 - o To the best of their knowledge, they have not been in contact with someone with a confirmed or probable case of COVID-19; and
 - o They have not been working on a site that was shut down due to the virus.
 - Individuals who are at increased risk of serious illness (due to age, pregnancy or other medical condition) are not to be permitted on site.
 - Any responses or results of any screening measures, whether they permit an individual on site or not, are to be kept private and treated as sensitive medical information.
 - Workers who are not authorized to access the site are to be safely transported directly back home, or to a preferred location of self-isolation. When unable to do so themselves, a vehicle and driver will be arranged for them.
 - When transporting a potentially ill individual, both driver and passenger are to be given masks and nitrile gloves. The passenger is to sit in the backseat, and the driver is to open and close the doors for them.
-

Response measures

Possible cases of COVID-19

- Individuals who have been potentially exposed to the virus, or who are exhibiting flu-like symptoms such as fever, tiredness, coughing, or congestion are instructed to:
 - o Not come to work;
 - o Contact their supervisor and/or human resources department;
 - o Stay at home and self-isolate; and
 - o Contact local health authorities for further direction.

Such individuals are required to follow the directions of the local health authority and may not return to work until given approval by the proper health authorities.
 - Individuals who begin to display flu-like symptoms on site are instructed to avoid touching anything, take extra care to contain coughs and sneezes, and return home immediately to undergo self-isolation as directed by the local health authority.
 - All areas on site potentially infected by a confirmed or probable case are barricaded to keep individuals two metres away until the area is properly cleaned and disinfected.
-



- Employers must inform other workers that they may have been exposed to COVID-19 in the workplace, including details regarding the date and time of the potential exposure and where it took place. However, information that might identify the infectious person should not be shared.

Response plans

- All contractors are to complete an integrated continuity plan to respond to partial or complete shutdown of construction sites or in the case of a severe limitation of site operations.

Other

- Refer to canada.ca/en/public-health/services/diseases/coronavirus-disease-covid-19.html for the latest information.

The situation related to COVID-19 is changing rapidly. This Protocol will be updated on an as required basis to reflect the latest broadly adopted measures.

For province specific guidance, please review the resources linked below. Questions on province-specific health and safety matters can be directed to the listed contacts.

British Columbia

British Columbia Construction Association

bccassn.com/media/Guidance%20to%20Construction%20Sites%20Operating%20During%20COVID19.pdf

BC Construction Safety Alliance

Mike Mckenna, Executive Director mmckenna@bccsa.ca

Tammy Oliver, Senior Director toliver@bccsa.ca

Alberta

Alberta Construction Association

albertaconstruction.net/wp-content/uploads/2020/04/PANDEMIC-PLANNING-FOR-THE-CONSTRUCTION-INDUSTRY.pdf

Alberta Roadbuilders and Heavy Construction Association

279e5ecb-ae4a-4a97-bda5-1b2fe77f0894.filesusr.com/ugd/77f1bc_683524748e3c482aac8a8f59e5a86218.pdf?index=true

Alberta Construction Safety Association

Dan MacLennan, CEO dmaclennan@youracsa.ca

Tammy Hawkins, COO thawkins@youracsa.ca



Saskatchewan

Saskatchewan Construction Association

scaonline.ca/third-party-information-bulletins.html

Saskatchewan Construction Safety Association

Thomas Archer, VP of Operations thomasa@scsaonline.ca

Collin Pullar, President collinp@scsaonline.ca

Heavy Construction Safety Association of Saskatchewan

Al Goldstone, Safety Director alg@hcsas.sk.ca

Manitoba

Winnipeg Construction Association

togetherwebuild.ca/

Construction Safety Association of Manitoba

Sean Scott, Executive Director sean@constructionsafety.ca

Derek Pott, Director of Operations derek@constructionsafety.ca

Manitoba Heavy Construction Association

Don Hurst, Director don@mhca.mb.ca

Ontario

ORBA / OGCA / RESCON / OSPE / OHBA

orba.org/wp-content/uploads/2020/03/ORBA-branded-COVID19-resource-and-best-management-practices-document-Final.pdf

Infrastructure Health & Safety Association

Enzo Garritano, President egarritano@ihsa.ca

Paul Casey, Vice President pcasey@ihsa.ca

Quebec

L'Association de la construction du Québec

acq.org/coronavirus/sante-securite-du-travail/

Commission des normes, de l'équité, de la santé et de la sécurité du travail

cnesst.gouv.qc.ca/salle-de-presse/covid-19/Pages/trousse.aspx?utm_source=CNESST&utm_medium=Carrousel-accueil&utm_campaign=Trousse_doutils

ASP Construction

Sylvie L'Heureux, Executive Director slheureux@asp-construction.org



New Brunswick

New Brunswick Construction Association

nbcsa.ca/wp-content/uploads/2020/04/Construction-Site-COVID-19-Prevention-Procedures.pdf

New Brunswick Construction Safety Association

Roy Silliker, CEO rsilliker@nbcsa.ca

Shelley Poirier, Senior Safety Advisor spoirier@nbcsa.ca

Nova Scotia

Construction Association of Nova Scotia

cans.ns.ca/covid-19-managing-covid-19-on-the-worksite/

Construction Safety Association of Nova Scotia

MJ MacDonald, CEO mmacdonald@constructionsafetyns.ca

Damon Alcock, Chief Safety Officer dalcock@constructionsafetyns.ca

Prince Edward Island

Construction Association of PEI

capei.ca/member_access/LiveEditor/images/Public%20Health%20Order%20-%20March%202020.pdf

Newfoundland and Labrador

Newfoundland and Labrador Construction Association

nlca.ca/critical-information-covid-19/

Newfoundland and Labrador Construction Safety Association

Jackie Manuel, CEO jmanuel@nlcsa.com

Yukon

Northern Safety Network Yukon

Sheila Sergy, Executive Director sheila@yukonsafety.com

Northwest Territories and Nunavut

Northern Construction Safety Association

Chris Johnston, Executive Director chris@nsa-nt.ca

