

## **PART 1 - GENERAL**

### **1.1 IMPLEMENTATION**

- .1 This contract shall be planned and implemented by the Contractor, such that all work is carried out within the specified time frame. All measures necessary to meet this deadline, shall be considered when bidding for this project.

### **1.2 SITE OF WORK**

- .1 Work will be carried out at the Bedford Institute of Oceanography (BIO), Dartmouth, Nova Scotia in the locations as shown on the accompanying drawings.

### **1.3 DATUM**

- .1 Datum used for this project is as shown on the drawings.

### **1.4 FAMILIARIZATION WITH SITE**

- .1 Before submitting a bid, it is recommended that bidders visit the site and its surroundings to review and verify the form, nature and extent of the work, materials necessary for the completion of the works, the means of access to the site, severity, exposure and uncertainty of weather, soil conditions, any accommodations they may require, and in general shall obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. No allowance shall be made subsequently in this connection on account of error or negligence to properly observe and determine the conditions that will apply. A meeting will be scheduled with Departmental Representative. Please contact Departmental Representative prior to visiting site. Allow 48 hours notice.
- .2 Contractors, bidders or those they invite to site are to review specification Section 01 35 29 - Health and Safety Requirements before visiting site. Take all appropriate safety measures for any visit to site, either before or after acceptance of bid.

### **1.5 CODES AND STANDARDS**

- .1 Perform work in accordance with the following codes and legislative requirements:
    - .1 Environment Act of the Province of Nova Scotia.
    - .2 Environmental Control (Water and Sewer) Regulations of the Province of Nova Scotia.
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- .3 Waste Material Disposal Act of the Province of Nova Scotia.
- .4 Canadian Environmental Protection Act.
- .5 Transportation Dangerous Goods Act.
- .6 Canadian Fisheries Act.
- .7 Canadian Council of Ministers of the Environment (CCME). National Guidelines for Decommissioning Industrial Sites.
- .8 Canada Labour Code Occupational Health and Safety Standards.
- .9 National Building Code of Canada, latest edition.
- .10 National Fire Code of Canada, latest edition.
  
- .11 Nova Scotia Occupational Health and Safety Act and Regulations.
- .12 The Storage and Handling of Gasoline and Associated Products Regulations by the Province of Nova Scotia.
- .13 Any other Federal, Provincial, Municipal and Local Code, Standard, Regulation, Guideline, By-Law or Ordinance having jurisdiction.
  
- .2 Materials and workmanship must meet or exceed requirements of specified standards, codes and referenced documents.

## **1.6 TERMS**

- .1 Unless specifically stated otherwise, the term Engineer where used in the Specifications and on the Drawings shall mean the Departmental Representative (DR) as defined in the General Conditions of the Contract.

## **1.7 SETTING OUT WORK**

- .1 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated or as directed by Departmental Representative.
- .2 Provide devices needed to layout and construct work.
- .3 Supply such devices as straight edges and templates required to facilitate Departmental Representative's inspection of work.
- .4 Supply stakes and other survey markers required for laying out work.

## **1.8 COST BREAKDOWN**

- .1 Before submitting first progress claim submit breakdown of Contract price in detail as directed by Departmental Representative and aggregating contract price.
  - .2 Provide cost breakdown in same format as the numerical and subject title system used in this specification and thereafter sub-divided into major work components as directed by Departmental Representative.
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- .3 Upon approval by Departmental Representative, cost breakdown will be used as basis for progress payment.
- .4 All work items and costs not designated in the unit price table as a measurement for payment, are to be included in the lump sum arrangement, as noted on the Bid and Acceptance Form.

## **1.9 WORK SCHEDULE**

- .1 Submit within five (5) working days of notification of acceptance of bid, a construction schedule showing commencement and completion of all work within the time stated on the bid and acceptance form and the date stated in the bid acceptance letter.
  - .2 Provide sufficient details in schedule to clearly illustrate entire implementation plan, depicting efficient coordination of tasks and resources, to achieve completion of work on time and permit effective monitoring of work progress in relation to established milestones.
  - .3 As a minimum, work schedule to be prepared and submitted in the form of bar (GANTT) charts, indicating work activities, tasks and other project elements, their anticipated durations and planned dates for achieving key activities and major project milestones provided in sufficient details and supported by narratives to demonstrate a reasonable plan for completion of project within designated time (e.g., show target dates for completion of each work item, if applicable). Breakdown elements to indicate target dates for completion of each element. Generally, bar charts derived from commercially available computerized project management systems are preferred but not mandatory.
  - .4 Submit schedule updates on an as-required basis and when requested by Departmental Representative. Provide a narrative explanation of necessary changes and schedule revisions at each update.
  - .5 The schedule, including all updates, shall be to the Departmental Representative's approval. Take necessary measures to complete work within approved time. Do not change schedule without Departmental Representative's approval.
  - .6 All work on the project will be completed within the time indicated on the Bid and Acceptance Form.
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### **1.10 ABBREVIATIONS**

- .1 Following abbreviations of standard specifications have been used in this specification and on the drawings:

CGSB - Canadian Government Specifications Board  
CSA - Canadian Standards Association  
NLGA - National Lumber Grades Authority  
ASTM - American Society for Testing and Materials  
DR - Departmental Representative

- .2 Where these abbreviations and standards are used in this project, latest edition in effect on date of bid call will be considered applicable.

### **1.11 SITE OPERATIONS**

- .1 Arrange for sufficient space adjacent to project site for conduct of operations, storage of materials, etc. Exercise care so as not to obstruct or damage public or private property in area. Do not interfere with normal day-to-day operations in progress at site. All arrangements for space and access will be made by Contractor.
- .2 Remove snow and ice as required to maintain safe access in a manner that does not damage existing structures or interfere with the operations of others.

### **1.12 PROJECT MEETINGS**

- .1 Departmental Representative will arrange project meetings and assume responsibility for setting times and recording minutes.
- .2 Project meetings will take place on site of work unless so directed by Departmental Representative.
- .3 Departmental Representative will assume responsibility for recording minutes of meetings and forwarding copies to all parties present at meetings.
- .4 Have a responsible member of firm present at all Project Meetings.

### **1.13 PROTECTION**

- .1 Store all materials and equipment to be incorporated into work to prevent damage by any means.
- .2 Repair and replace all materials or equipment damaged in transit or storage to the
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satisfaction of the Departmental Representative and at no cost to Crown.

#### **1.14 EXISTING SERVICES**

- .1 Where work involves breaking into or connecting to existing services, carry out work at times directed by governing authorities, with minimum of disturbance to site operations, pedestrian, vehicular traffic, and tenant operations.
- .2 Before commencing work, establish locations and extent of service lines in area of work and notify Departmental Representative of findings.
- .3 Submit schedule to and obtain approval from Departmental Representative for any shutdown or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.
- .4 Provide temporary services to maintain critical facility systems.
- .5 Provide adequate bridging over trenches which cross walkways or roads to permit normal traffic.
- .6 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.
- .7 Protect, relocate or maintain existing active services as required. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction over service. Record locations of maintained, re-routed and abandoned service lines.

#### **1.15 DOCUMENTS REQUIRED**

- .1 Maintain at job site, one (1) 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 Site specific Health and Safety Plan and other safety related documents.
  - .11 Permits and Regulatory Approvals and Requirements.
  - .12 Other documents as stipulated elsewhere in the Contract Documents.

#### **1.16 PERMITS**

- .1 Obtain and pay for all permits, certificates and licenses as required by Municipal, Provincial, Federal and other authorities.
- .2 Provide appropriate notifications of project to Municipal and Provincial inspection authorities.
- .3 Obtain compliance certificates as prescribed by legislative and regulatory provisions of municipal, provincial and federal authorities as applicable to the performance of work.
- .4 Submit to Departmental Representative, copy of application submissions and approval documents received for above referenced authorities.
- .5 Submit to Departmental Representative, copy of quarry permit, if applicable, prior to start of quarry operations.
- .6 Comply with all requirements, recommendations and advice by all regulatory authorities unless otherwise agreed in writing by Departmental Representative. Make requests for such deviations to these requirements sufficiently in advance of related work.

#### **1.17 CUTTING, FITTING AND PATCHING**

- .1 Execute cutting, including excavation, fitting and patching required to make work fit properly.
- .2 Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work. This includes patching of openings in existing work resulting from removal of existing services.
- .3 Do not cut, bore, or sleeve load-bearing members.
- .4 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.

#### **1.18 LOCATION OF EQUIPMENT**

- .1 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
  - .2 Inform Departmental Representative when impending installation conflicts with other new or existing components. Follow directives for actual location.
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- .3 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

### **1.19 ACCEPTANCE**

- .1 Prior to the issuance of the Certificate of Substantial Performance, in company with Departmental Representative, make a check of all work. Correct all discrepancies before final inspection and acceptance.

### **1.20 WORKS COORDINATION**

- .1 Contractor to be responsible for coordinating the work of the various trades, where the work of such trades interfaces with each other.
- .2 Convene meetings between trades whose work interfaces and ensure that they are fully aware of the areas and the extent of where interfacing is required. Provide each trade with the plans and specifications of the interfacing trade, as required, to assist them in planning and carrying out their respective work.
- .3 The Crown will not be responsible for or held accountable for any extra costs incurred as a result of the failure to carry out coordination work. Disputes between the various trades as a result of their not being informed of the areas and extent of interface work shall be the sole responsibility of the General Contractor and shall be resolved at no extra cost to the Crown.

### **1.21 CONTRACTOR'S USE OF SITE**

- .1 Construction operations, including storage of materials, for this contract not to interfere with the operations at this facility.
  - .2 Responsible for arranging the storage of materials on or off site and any materials stored at the site which interfere with any of the day-to-day activities at or near the site will be moved promptly at the Contractor's expense, upon request by the Departmental Representative.
  - .3 Contractor will take adequate precautions to protect existing structures when operating tracked equipment.
  - .4 Exercise care so as not to obstruct or damage public or private property in the area.
  - .5 At completion of work, restore area to its original condition. Damage to ground and property will be repaired by Contractor. Remove all construction materials, residue, excess, etc., and leave site in a condition acceptable to Departmental Representative.
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### **1.22 WORK COMMENCEMENT**

- .1 Mobilization to project site is to commence immediately after acceptance of bid and submission of site specific Safety Plan and insurance documentation, unless otherwise agreed by Departmental Representative.
- .2 Project work on site is to commence as soon as possible with a continuous reasonable workforce unless otherwise agreed by Departmental Representative.
- .3 Weather conditions, short construction season, delivery challenges and the location of the work site may require the use of longer working days and additional workforce to complete the project within the specified completion time.
- .4 Make every effort to ensure that sufficient material and equipment is delivered to site at the earliest possible date after acceptance of bid and replenished as required.

### **1.23 FACILITY SMOKING ENVIRONMENT**

- .1 Comply with smoking restrictions.

### **1.24 INTERPRETATION OF DOCUMENTS**

- .1 Supplementary to the General Conditions, the Division 01 sections of the specifications take precedence over technical specification in other divisions of the specifications.

## **PART 2 - PRODUCTS**

Not applicable

## **PART 3 - EXECUTION**

Not applicable



## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 01 32 16.07 - Construction Progress Schedule - Bar (GANTT) Chart.

### **1.2 ACCESS AND EGRESS**

- .1 Design, construct and maintain temporary “access to” and “egress from “ work areas, including stairs, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

### **1.3 USE OF SITE AND FACILITIES**

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.
- .2 Maintain existing services to building and provide for personnel and vehicle access.
- .3 Where security is reduced by work provide temporary means to maintain security.
- .4 Closures: protect work temporarily until permanent enclosures are completed.

### **1.4 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING**

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

### **1.5 EXISTING SERVICES**

- .1 Extreme caution is to be taken during excavation so as not to damage existing buried utilities in any way. Any damage shall be repaired by the Contractor, at no additional cost to the Departmental Representative. Excavation operations shall be coordinated with the Departmental Representative.
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## **1.6 SPECIAL REQUIREMENTS**

- .1 Submit schedule in accordance with Section 01 32 16.07 - Construction Progress  
Schedule - Bar (GANTT) Chart.
- .2 Ensure that Contractor personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.

## **1.7 SECURITY CLEARANCES**

- .1 Personnel employed on this project will be subject to a security check. Obtain clearance for each individual who will require to enter premises.
- .2 Personnel will be check daily at start of work shift and provided with a pass which must be worn at all times. Pass must be returned at end of work shift and personnel checked out.

## **PART 2 - PRODUCTS**

Not applicable

## **PART 3 - EXECUTION**

Not applicable

**PART 1 - GENERAL**

**1.1 GENERAL REQUIREMENTS**

- .1 The Form of Tender includes one lump sum priced item.
- .2 Additional instructions for measurement and/or payment for items of the work may be contained in specific sections of the Technical Specifications. In the case of a conflict between the instructions for measurement and payment contained in this section with that of any other section, the requirement of this section shall apply.
- .3 The submitted tender price will be inclusive of all costs for the complete supply and installation of all materials, labour and equipment required to complete the work. No separate payment will be made for any testing, inspections and approvals required by Contractor.

**PART 2 - PRODUCTS**

Not applicable

**PART 3 - EXECUTION**

Not applicable

## **PART 1 - GENERAL**

### **1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE**

- .1 Particular requirements for inspection and testing to be carried out by testing laboratory are specified under various sections. The testing laboratory shall be certified by the Canadian Council of Independent Laboratories (CCIL) in accordance with CSA Standard A283.06, and shall require prior approval of the Departmental Representative.

### **1.2 APPOINTMENT AND PAYMENT**

- .1 Contractor will appoint and pay for services of testing laboratory for the following:
  - .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
  - .2 Inspection and testing performed exclusively for Contractor's convenience.
  - .3 Tests specified to be carried out by Contractor under the supervision of Departmental Representative.
  - .4 Tests requested by Departmental Representative to confirm material specifications when the applicable manufacturer's documentation or test results are unavailable.
  - .5 Additional tests specified in paragraph 1.2.2.
- .2 Where test or inspections by designated testing laboratory reveal work not in accordance with contract requirements, Contractor shall pay costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected work.

### **1.3 CONTRACTOR'S RESPONSIBILITIES**

- .1 Furnish labour and facilities to:
    - .1 Provide access to work to be inspected and tested.
    - .2 Facilitate inspections and tests.
    - .3 Make good work disturbed by inspection and test.
    - .4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.
  - .2 Notify Departmental Representative sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.
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- .3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.
- .4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Departmental Representative.

**PART 2 - PRODUCTS**

Not applicable

**PART 3 - EXECUTION**

Not applicable

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## **PART 1 - GENERAL**

### **1.1 DEFINITIONS**

- .1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.
  - .2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.
  - .3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.
  - .4 Construction Work Week: Monday to Friday, inclusive, will provide five (5) day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.
  - .5 Duration: number of work periods (not including holidays or other non-working periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.
  - .6 Master Plan: summary-level schedule that identifies major activities and key milestones.
  - .7 Milestone: significant event in project, usually completion of major deliverable.
  - .8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.
  - .9 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.
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## **1.2 REQUIREMENTS**

- .1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.
- .2 Plan to complete work in accordance with prescribed milestones and time frame.
- .3 Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting.
- .4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

## **1.3 SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Departmental Representative, within 10 days of Award of Contract, Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.
- .3 Submit Project Schedule to Departmental Representative within five (5) working days of receipt of acceptance of Master Plan.
- .4 Should contractor want to work weekends/holidays, a written request must be submitted to the Departmental Representative at least 2 days in advance to allow for scheduling of on-site Departmental Representative.

## **1.4 PROJECT MILESTONES**

- .1 This contract shall be planned and implemented by the Contractor, such that all work is carried out and completed within the specified time frame. All measures necessary to meet this deadline shall be considered as indicated when bidding this project.
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### **1.5 MASTER PLAN**

- .1 Structure schedule to allow orderly planning, organizing and execution of work as Bar Chart (GANTT).
- .2 Departmental Representative will review and return revised schedules with five (5) working days.
- .3 Revise impractical schedule and resubmit within five (5) working days.
- .4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

### **1.6 PROJECT SCHEDULE**

- .1 Develop detailed Project Schedule derived from Master Plan.
- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
  - .1 Award.
  - .2 Shop Drawings.
  - .3 Permits.
  - .4 Mobilization.
  - .5 Major equipment delivery.
  - .6 Building installation.
  - .7 Connections to existing infrastructure.
  - .8 Testing and Commissioning.
  - .9 Restoration.

### **1.7 PROJECT SCHEDULE REPORTING**

- .1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.
  - .2 Include as part of Project Schedule, narrative report identifying work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.
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## **1.8 PROJECT MEETINGS**

- .1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.
- .2 Weather related delays with their remedial measures will be discussed and negotiated.

## **PART 2 - PRODUCTS**

Not applicable

## **PART 3 - EXECUTION**

Not applicable

**PART 1 - GENERAL**

**1.1 SUBMITTAL GENERAL REQUIREMENTS**

- .1 Submit to Departmental Representative for review submittals listed, including shop drawings, samples, certificates and other data, as specified in other sections of the Specifications.
  - .2 Submit with reasonable promptness and in orderly sequence so as to allow for Departmental Representative's review and not cause delay in Work. Failure to submit in ample time will not be considered sufficient reason for an extension of Contract time and no claim for extension by reason of such default will be allowed.
  - .3 Do not proceed with work until relevant submissions are reviewed by Departmental Representative.
  - .4 Present shop drawings, product data and samples in SI Metric units.
  - .5 Where items or information is not produced in SI Metric units, provide soft converted values.
  - .6 Review submittals prior to submission to Departmental Representative. Ensure during review that necessary requirements have been determined and verified, required field measurements or data have been taken, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents.
    - .1 Submittals not stamped, signed, dated and identified as to specific project will be returned unexamined by Departmental Representative and considered rejected.
  - .7 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
  - .8 Verify field measurements and affected adjacent work and coordinate.
  - .9 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
  - .10 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative's review.
  - .11 Submittal format: electronic copies.
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- .12 Make changes or revisions to submissions which Departmental Representative may require, consistent with Contract Documents and resubmit as directed by Departmental Representative. When resubmitting, notify Departmental Representative in writing of any revisions other than those requested.
- .13 Keep one reviewed copy of each submittal document on site for duration of Work.

## **1.2 SHOP DRAWINGS AND PRODUCT DATA**

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work that are specific to project requirements.
  - .2 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 co-ordinated, regardless of Section under which adjacent items will be supplied and installed.
  - .3 Allow five (5) working days for Departmental Representative's review of each submission.
  - .4 Accompany submissions with transmittal letter containing:
    - .1 Date.
    - .2 Project title and number.
    - .3 Contractor's name and address.
    - .4 Identification and quantity of each shop drawing, product data and sample.
    - .5 Other pertinent data.
  - .5 Submissions 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.
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- .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.
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- .6 After Departmental Representative's review, distribute copies.
  - .7 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
  - .8 Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
  - .9 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
    - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
    - .2 Testing must have been within 3 years of date of contract award for project.
  - .10 Submit electronic copies of certificates for requirements requested in specification Sections and as requested by Departmental Representative.
    - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
    - .2 Certificates must be dated after award of project contract complete with project name.
  - .11 Submit electronic copies of manufacturer's instructions for requirements requested in specification Sections and as requested by Departmental Representative.
    - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
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- .12 Submit electronic copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
  - .1 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .13 Submit electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.
- .14 Delete information not applicable to project.
- .15 Supplement standard information to provide details applicable to project.
- .16 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, transparency 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.
- .17 The review of shop drawings by Departmental Representative is for sole purpose of ascertaining conformance with general concept.
  - .1 This review shall not mean that the Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
  - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

### **1.3 SCHEDULES, PERMITS AND CERTIFICATES**

- .1 Upon acceptance of bid, submit to Departmental Representative copy of Work Schedule and various other schedules, permits, certification documents and project management plans as specified in other sections of the Specifications.
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- .2 Submit copy of permits, notices, compliance Certificates received from Regulatory Agencies having jurisdiction and as applicable to the Work.
- .3 Submission of above documents to be in accordance with Submittal General Requirements procedures specified in this section.

## **PART 2 - PRODUCTS**

Not applicable

## **PART 3 - EXECUTION**

Not applicable

## **PART 1 - GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Fire Safety Requirements
- .2 Hot Work Permit

### **1.2 RELATED WORK**

- .1 Section 01 35 25 - Special Procedures on Lockout Requirements.
- .2 Section 01 35 29 - Health and Safety Requirements

### **1.3 REFERENCES**

- .1 Fire Protection Standards issued by Fire Protection Services of Human Resources Development Canada as follows:
  - .1 FCC No. 301-June 1982 Standard for Construction Operations ([http://www.hrsdc.gc.ca/eng/labour/fire\\_protection/policies\\_standards/commissioner/301/page00.shtml](http://www.hrsdc.gc.ca/eng/labour/fire_protection/policies_standards/commissioner/301/page00.shtml)).
  - .2 FCC No. 302-June1982 Standard for Welding and Cutting ([http://www.hrsdc.gc.ca/eng/labour/fire\\_protection/policies\\_standards/commissioner/302/page00.shtml](http://www.hrsdc.gc.ca/eng/labour/fire_protection/policies_standards/commissioner/302/page00.shtml)).

### **1.4 DEFINITIONS**

- .1 Hot Work defined as:
  - .1 Welding work
  - .2 Cutting of materials by use of torch or other open flame devices
  - .3 Grinding with equipment which produces sparks.

### **1.5 SUBMITTALS**

- .1 Submit copy of Hot Work Procedures and sample of hot work permit to Departmental Representative for review, within 14 calendar days after notification of acceptance of bid.
  - .2 Submit in accordance with the Submittal General Requirements specified in Section 01 33 00.
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## **1.6 FIRE SAFETY REQUIREMENTS**

- .1 Implement and follow fire safety measures during work. Comply with following:
  - .1 National Fire Code, latest edition
  - .2 Fire Protection Standards FCC 301 and FCC 302.
  - .3 Federal and Provincial Occupational Health and Safety Acts and Regulations as specified in section 01 35 29.
- .2 In event of conflict between any provisions of above authorities the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on the course of action to be followed.

## **1.7 HOT WORK AUTHORIZATION**

- .1 Obtain Departmental Representative's written "Authorization to Proceed" before conducting any form of Hot Work on site.
  - .2 To obtain authorization and submit to Departmental Representative:
    - .1 Contractor's typewritten Hot Work Procedures to be followed on site as specified below.
    - .2 Description of the type and frequency of Hot Work required.
    - .3 Sample Hot Work permit to be used.
  - .3 Upon review and confirmation that effective fire safety measures will be implemented during performance of hot work, Departmental Representative will provide authorization to proceed as follows:
    - .1 Issue one (1) written "Authorization to Proceed" covering the entire project for duration of work; or
    - .2 Separate work, or segregate certain parts of work, into individual entities. Each entity requiring a separately written "Authorization to Proceed" from Departmental Representative. Follow Departmental Representative's directives in this regard.
  - .4 Requirement for individual authorization based on:
    - .1 Nature or phasing of work;
    - .2 Risk to Facility operations;
    - .3 Quantity of various trades needing to perform hot work on project; or
    - .4 Other situation deemed necessary by Departmental Representative to ensure fire safety on premises.
  - .5 Do not perform any Hot Work until receipt of Departmental Representative's written "Authorization to Proceed" for that portion of work.
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- .6 In tenant occupied facility, coordinate performance of Hot Work with Facility Manager through the Departmental Representative. When directed perform Hot Work only during non-operative hours of Facility. Follow Departmental Representative's directives in this regard.

## **1.8 HOT WORK PROCEDURES**

- .1 Develop and implement safety procedures and work practices to be followed during the performance of Hot Work.
- .2 Procedures to include:
  - .1 Requirement to perform hazard assessment of site and immediate hot work area for each hot work event in accordance with Hazard Assessment and Safety Plan requirements of Section 01 35 29.
  - .2 Use of a Hot Work Permit system for each hot work event.
  - .3 The step-by-step process of how to prepare and issue permit.
  - .4 Permit shall be issued by Contractor's site Superintendent, or other authorized person designated by Contractor, granting permission to worker or sub-contractor to proceed with hot work.
  - .5 Provision of a designated person to carry out a Fire Safety Watch for a minimum of 30 minutes immediately upon completion of the hot work.
  - .6 Compliance with fire safety codes and standards specified herein and occupational health and safety regulations specified in Section 01 35 29.
- .3 Generic procedures, if used, must be edited and supplemented with pertinent information tailored to reflect specific project conditions. Clearly label as being the Hot Work Procedures applicable to this contract.
- .4 Hot Work Procedures shall clearly establish worker instructions and allocate responsibilities of:
  - .1 Worker(s).
  - .2 Authorized person issuing the Hot Work Permit.
  - .3 Fire Safety Watcher.
  - .4 Sub-contractors and Contractor.
- .5 Brief all workers and sub-contractors on Hot Work Procedures and Permit system established for project. Stringently enforce compliance.
  - .1 Failure to comply with the established procedures may result in the issuance of a Non-Compliance Notification at Departmental Representative's discretion with possible disciplinary measures imposed as specified in Section 01 35 29.

## **1.9 HOT WORK PERMIT**

- .1 Hot Work Permit to include, as a minimum, the following data:
  - .1 Project name and project number;
  - .2 Building name, address and specific floor, room or area where hot work will be performed;
  - .3 Date when permit issued;
  - .4 Description of hot work to be performed;
  - .5 Special precautions required, including type of fire extinguisher needed;
  - .6 Name and signature of person authorized issue the permit;
  - .7 Name of worker(s) (clearly printed) to whom the permit is being issued;
  - .8 Time duration that permit is valid (not to exceed 8 hours). Indicate "Start" time & date and "Completion" time & date;
  - .9 Worker signature with date and time upon hot work termination;
  - .10 Specified period of time requiring Safety Watch;
  - .11 Name and signature of person designated as Fire Safety Watcher, complete with time and date when safety watch terminated, certifying that the surrounding area was under continual surveillance and inspection during the full time period specified in permit and commenced immediately upon the completion of Hot Work.
- .2 Permit to be in typewritten form. Industry Standard forms shall only be used if all data specified above is included on form.
- .3 Each Hot Work Permit to be completed in full and signed as follows:
  - .1 Authorized person issuing Permit before hot work commences;
  - .2 Worker(s) upon completion of Hot Work;
  - .3 Fire Safety Watcher upon termination of safety watch and;
  - .4 Returned to Contractor's Site Superintendent for safe keeping.

## **1.10 DOCUMENTS ON SITE**

- .1 Keep Hot Work Permits and hazard assessment documentation on site for duration of work.
- .2 Upon request, make available to Departmental Representative or to authorized safety representative for inspection.

## **PART 2 - PRODUCTS**

Not applicable

## **PART 3 - EXECUTION**

Not applicable

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END

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## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 01 35 24 - Special Procedures on Fire Safety Requirements.
- .2 Section 01 35 29 - Health and Safety Requirements.

### **1.2 REFERENCES**

- .1 CSA C22.1-06 - Canadian Electrical Code, Part 1, Safety Standard for Electrical Installations.
- .2 CAN/CSA C22.3 No. 1-06 - Overhead Systems.
- .3 CAN/CSA C22.3 No. 7-06 - Underground Systems.
- .4 COSH, Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code.

### **1.3 DEFINITIONS**

- .1 Electrical Facility: means any system, equipment, device, apparatus, wiring, conductor, assembly or part thereof that is used for the generation, transformation, transmission, distribution, storage, control, measurement or utilization of electrical energy, and that has an amperage and voltage that is dangerous to persons.
  - .2 Guarantee of Isolation: means a guarantee by a competent person in control or in charge that a particular facility or equipment is isolated.
  - .3 De-energize: in the electrical sense, that a piece of equipment is isolated and grounded, e.g. if the equipment is not grounded, it cannot be considered de-energized (DEAD).
  - .4 Guarded: means that an equipment or facility is covered, shielded, fenced, enclosed, inaccessible by location, or otherwise protected in a manner that, to the extent that is reasonably practicable, will prevent or reduce danger to any person who might touch or go near such item.
  - .5 Isolate: means that an electrical facility, mechanical equipment or machinery is separated or disconnected from every source of electrical, mechanical, hydraulic, pneumatic or other kind of energy that is capable of making it dangerous.
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- .6 Live/alive: means that an electrical facility produces, contains, stores or is electrically connected to a source of alternating or direct current of an amperage and voltage that is dangerous or contains any hydraulic, pneumatic or other kind of energy that is capable of making the facility dangerous to persons.

#### **1.4 COMPLIANCE REQUIREMENTS**

- .1 Perform lockouts in compliance with:
- .1 Canadian Electrical Code.
  - .2 Federal and Provincial Occupational Health and Safety Acts and Regulations as specified in Section 01 35 29.
  - .3 Regulations and code of practice as applicable to mechanical equipment or other machinery being de-energized.
  - .4 Procedures specified herein.
- .2 In event of conflict between any provisions of above authorities the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on the course of action to be followed.

#### **1.5 SUBMITTALS**

- .1 Submit copy of proposed Lockout Procedures and sample form of lockout permit for review.
- .2 Submit documentation within seven (7) calendar days of acceptance of bid. Do not proceed with work until submittal has been reviewed by Departmental Representative.
- .3 Submit above documents in accordance with the submittal requirements specified in Section 01 33 00.
- .4 Resubmit Lockout Procedures with noted revisions as may result from Departmental Representative's review.

#### **1.6 ISOLATION OF EXISTING SERVICES**

- .1 Obtain Departmental Representative's written authorization prior to conducting work on an existing active, energized service or facility required as part of the work and before proceeding with lockout of such services or facility.
- .2 To obtain authorization, submit to Departmental Representative following documentation:
- .1 Written Request for Isolation of the service or facility and;
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- .2 Copy of Contractor's Lockout Procedures.
- .3 Make a Request for Isolation for each event, unless directed otherwise by Departmental Representative, and as follows:
  - .1 Fill-out standard forms in current use at the facility when so directed by Departmental Representative or;
  - .2 Where no form exists at facility, make request in writing identifying:
    - .1 Identification of system or equipment to be isolated, including its location;
    - .2 Time duration, indicating start time and date and completion time and date when isolation will be in effect.
    - .3 Voltage of service feed to system or equipment being isolated.
    - .4 Name of person making the request.
  - .3 Document to be in typewritten format.
- .4 Do not proceed until receipt of written notification from Departmental Representative granting the isolation request and authorization to proceed with the isolation of designated equipment or facility. Departmental Representative may designate other individual at the facility as the person authorized to grant the isolation request.
- .5 Conduct safe, orderly shut down of equipment or facilities, de-energize and isolate power and other sources of energy and lockout items in accordance with requirement of clause 1.8 below.
- .6 Plan and schedule shut down of existing services in consultation with the Departmental Representative and the Facility Manager. Minimize impact and downtime of facility operations.
- .7 Determine in advance, as much as possible, in cooperation with the Departmental Representative, the type and frequency of situations which will require a Request for Isolation. Follow Departmental Representative's directives in this regard.
- .8 Conduct hazard assessment as part of the planning process of isolating existing equipment and facilities. Hazard assessments to conform with requirements of Health and Safety Requirements Section 01 35 29.

## **1.7 LOCKOUTS**

- .1 Isolate and lockout electrical facilities, mechanical equipment and machinery from all potential energy sources prior to starting work on such items.
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- .2 Develop and implement lockout procedures to be followed on site as an integral part of the work.
  - .3 Use energy isolation lockout devices specifically designed and appropriate for type of facility or equipment being locked out.
  - .4 Use industry standard lockout tags.
  - .5 Provide appropriate safety grounding and guards as required.
  - .6 Prepare Lockout Procedures in writing. Describe safe work practices, work functions and sequence of activities to be followed on site to safely isolate all potential energy sources and lockout/tagout facilities and equipment.
  - .7 Include within procedures a system of worker request and issuance of individual lockout permit by a person, employed by Contractor, designated to be "in-charge" and being responsible for:
    - .1 Controlling issuance of permits or tags to workers.
    - .2 Determining permit duration.
    - .3 Maintaining record of permits and tags issued.
    - .4 Submitting a Request for Isolation to Departmental Representative when required in accordance with Clause 1.7 above.
    - .5 Designating a Safety Watcher, when one is required based on type of work.
    - .6 Ensuring equipment or facility has been properly isolated, providing a Guarantee of Isolation to worker(s) prior to proceeding with work.
    - .7 Collecting and safekeeping lockout tags, returned by workers, as a record of the event.
  - .8 Clearly establish, describe and allocate, within procedures, the responsibilities of:
    - .1 Workers.
    - .2 Designated person controlling issuance of lockout tags/permits.
    - .3 Safety Watcher.
    - .4 Subcontractors and General Contractor.
  - .9 Procedures shall meet the requirements of Codes and Regulations specified in clause 1.5 above.
  - .10 Generic procedures, if used, must be edited, supplemented with pertinent information and tailored to reflect specific project conditions. Clearly label as being the procedures applicable to this contract.
    - .1 Incorporate site specific rules and procedures established by Facility Manager and in force at site. Obtain such procedures through Departmental Representative.
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- .11 Procedures to be in typewritten format.
- .12 Submit copy of Lockout Procedures to Departmental Representative, in accordance with submittal requirements of clause 1.6 herein, prior to commencement of work.

## **1.8 CONFORMANCE**

- .1 Ensure that lockout procedures, as established for project on site, are stringently followed. Enforce use and compliance by all workers.
- .2 Brief all persons working on electrical facilities, mechanical and other equipment fed by an energy source on requirements of this section.
- .3 Failure to perform lockouts in accordance with regulatory requirements or follow procedures specified herein may result in the issuance of a Non-Compliance Notification at Departmental Representative's discretion with possible disciplinary measures imposed as specified in Section 01 35 29.

## **1.9 DOCUMENTS ON SITE**

- .1 Post Lockout Procedures on site in common location for viewing by workers.
- .2 Keep copies of Request for Isolation submitted to Departmental Representative and lockout permits or tags issued to workers during the course of work for full project duration.
- .3 Upon request, make such data available to Departmental Representative or to authorized safety representative for inspection.

## **PART 2 - PRODUCTS**

Not applicable

## **PART 3 - EXECUTION**

Not applicable

## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 01 35 24: Special Procedures on Fire Safety Requirements.
- .2 Section 01 35 25: Special Procedures on Lockout Requirements.

### **1.2 DEFINITIONS**

- .1 COSH: Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code.
- .2 Competent Person: means a person who is:
  - .1 Qualified by virtue of personal knowledge, training and experience to perform assigned work in a manner that will ensure the health and safety of persons in the workplace, and;
  - .2 Knowledgeable about the provisions of occupational health and safety statutes and regulations that apply to the Work and;
  - .3 Knowledgeable about potential or actual danger to health or safety associated with the Work.
- .3 Medical Aid Injury: any minor injury for which medical treatment was provided and the cost of which is covered by Workers' Compensation Board of the province in which the injury was incurred.
- .4 PPE: personal protective equipment
- .5 Work Site: where used in this section shall mean areas, located at the premises where Work is undertaken, used by Contractor to perform all of the activities associated with the performance of the Work.

### **1.3 SUBMITTALS**

- .1 Make submittals in accordance with Section 01 33 00.
  - .2 Submit site-specific Health and Safety Plan prior to commencement of Work.
    - .1 Submit within 5 work days of notification of Bid Acceptance. Provide 3 copies.
    - .2 Departmental Representative will review Health and Safety Plan and provide comments.
    - .3 Revise the Plan as appropriate and resubmit within 5 work days after receipt of comments.
    - .4 Departmental Representative's review and comments made of the Plan shall not be construed as an endorsement, approval or implied warranty of any
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kind by Canada and does not reduce Contractor's overall responsibility for Occupational Health and Safety of the Work.

- .5 Submit revisions and updates made to the Plan during the course of Work.
- .3 Submit name of designated Health & Safety Site Representative and support documentation specified in the Safety Plan.
- .4 Submit building permit, compliance certificates and other permits obtained.
- .5 Submit copy of Letter in Good Standing from Provincial Workers Compensation or other department of labour organization.
  - .1 Submit update of Letter of Good Standing whenever expiration date occurs during the period of Work.
- .6 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .7 Submit copies of incident reports.
- .8 Submit WHMIS MSDS - Material Safety Data Sheets.

#### **1.4 COMPLIANCE REQUIREMENTS**

- .1 Comply with Occupational Health and Safety Act for Province of Nova Scotia, and Occupational Health & Safety Regulations made pursuant to the Act.
- .2 Comply with Canada Labour Code - Part II (entitled Occupational Health and Safety) and the Canada Occupational Health and Safety Regulations (COSH) as well as any other regulations made pursuant to the Act.
  - .1 The Canada Labour Code can be viewed at:  
[www.http://laws.justice.gc.ca/en/L-2/](http://laws.justice.gc.ca/en/L-2/)
  - .2 COSH can be viewed at: [www.http://laws.justice.gc.ca/eng/SOR-86-304/n e .html](http://laws.justice.gc.ca/eng/SOR-86-304/n e .html)
  - .3 A copy may be obtained at: Canadian Government Publishing Public Works & Government Services Canada Ottawa, Ontario, K1A 0S9 Tel: (819) 956-4800 (1-800-635-7943) Publication No. L31-85/2000 E or F)
- .3 Observe construction safety measures of:
  - .1 Part 8 of National Building Code
  - .2 Municipal by-laws and ordinances.
- .4 In case of conflict or discrepancy between above specified requirements, the more stringent shall apply.

- .5 Maintain Workers Compensation Coverage in good standing for duration of Contract. Provide proof of clearance through submission of Letter in Good Standing.
- .6 Medical Surveillance: Where prescribed by legislation or regulation, obtain and maintain worker medical surveillance documentation.

## **1.5 RESPONSIBILITY**

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons and environment adjacent to the site to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by all workers, sub-contractors and other persons granted access to Work Site with safety requirements of Contract Documents, applicable federal, provincial, and local by-laws, regulations, and ordinances, and with site-specific Health and Safety Plan.

## **1.6 SITE CONTROL AND ACCESS**

- .1 Control the Work and entry points to Work Site. Approve and grant access only to workers and authorized persons. Immediately stop and remove non-authorized persons.
    - .1 Departmental Representative will provide names of those persons authorized by Departmental Representative to enter onto Work Site and will ensure that such authorized persons have the required knowledge and training on Health and Safety pertinent to their reason for being at the site, however, Contractor remains responsible for the health and safety of authorized persons while at the Work Site.
  - .2 Isolate Work Site from other areas of the premises by use of appropriate means.
    - .1 Erect fences, hoarding, barricades and temporary lighting as required to effectively delineate the Work Site, stop non-authorized entry, and to protect pedestrians and vehicular traffic around and adjacent to the Work and create a safe environment. See Section 01 56 00 for minimum acceptable requirements.
    - .2 Post signage at entry points and other strategic locations indicating restricted access and conditions for access.
    - .3 Use professionally made signs with bilingual message in the 2 official languages or international known graphic symbols.
  - .3 Provide safety orientation session to persons granted access to Work Site. Advise of hazards and safety rules to be observed while on site.
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- .4 Ensure persons granted site access wear appropriate PPE. Supply PPE to inspection authorities who require access to conduct tests or perform inspections.
- .5 Secure Work Site against entry when inactive or unoccupied and to protect persons against harm.

## **1.7 PROTECTION**

- .1 Give precedence to safety and health of persons and protection of environment over cost and schedule considerations for Work.
- .2 Should unforeseen or peculiar safety related hazard or condition become evident during performance of Work, immediately take measures to rectify situation and prevent damage or harm. Advise Departmental Representative verbally and in writing.

## **1.8 FILING OF NOTICE**

- .1 File Notice of Project with pertinent provincial health and safety authorities prior to beginning of Work.
  - .1 Departmental Representative will assist in locating address if needed.

## **1.9 PERMITS**

- .1 Post permits, licenses and compliance certificates, specified in section 01 10 10, at Work Site.
- .2 Where a particular permit or compliance certificate cannot be obtained, notify Departmental Representative in writing and obtain approval to proceed before carrying out applicable portion of work.

## **1.10 HAZARD ASSESSMENTS**

- .1 Perform site specific health and safety hazard assessment of the Work and its site.
  - .2 Carryout initial assessment prior to commencement of Work with further assessments as needed during progress of work.
  - .3 Record results and address in Health and Safety Plan.
  - .4 Keep documentation on site for entire duration of the Work.
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### **1.11 PROJECT/SITE CONDITIONS**

- .1 Following are potential health, environmental and safety hazards at the site for which Work may involve contact with:
  - .1 Known latent site and environmental conditions:
    - .1 Buried utilities.
  - .2 Facility on-going operations:
    - .1 Vehicle traffic from operational parking lot.
  - .3 Building construction hazards:
    - .1 Heavy equipment traffic.
    - .2 Work at heights.
    - .3 Work with electricity.
    - .4 Hot work.
- .2 Above items shall not be construed as being complete and inclusive of potential health and safety hazards encountered during Work.
- .3 Include above items in the hazard assessment of the Work.
- .4 MSDS Data sheets of pertinent hazardous and controlled products stored on site can be obtained from Departmental Representative.

### **1.12 MEETINGS**

- .1 Attend pre-construction health and safety meeting, convened and chaired by Departmental Representative, prior to commencement of Work, at time, date and location determined by Departmental Representative. Ensure attendance of:
  - .1 Superintendent of Work
  - .2 Designated Health & Safety Site Representative
  - .3 Subcontractors
- .2 Conduct regularly scheduled tool box and safety meetings during the Work in conformance with Occupational Health and Safety regulations.
- .3 Keep documents on site.

### **1.13 HEALTH AND SAFETY PLAN**

- .1 Prior to commencement of Work, develop written Health and Safety Plan specific to the Work. Implement, maintain, and enforce Plan for entire duration of Work and until final demobilization from site.
- .2 Health and Safety Plan shall include the following components:
  - .1 List of health risks and safety hazards identified by hazard assessment.
  - .2 Control measures used to mitigate risks and hazards identified.

- .3 On-site Contingency and Emergency Response Plan as specified below.
- .4 On-site Communication Plan as specified below.
- .5 Name of Contractor's designated Health & Safety Site Representative and information showing proof of his/her competence and reporting relationship in Contractor's company.
- .6 Names, competence and reporting relationship of other supervisory personnel used in the Work for occupational health and safety purposes.
- .3 On-site Contingency and Emergency Response Plan shall include:
  - .1 Operational procedures, evacuation measures and communication process to be implemented in the event of an emergency.
  - .2 Evacuation Plan: site and floor plan layouts showing escape routes, marshalling areas. Details on alarm notification methods, fire drills, location of fire fighting equipment and other related data.
  - .3 Name, duties and responsibilities of persons designated as Emergency Warden(s) and deputies.
  - .4 Emergency Contacts: name and telephone number of officials from:
    - .1 General Contractor and subcontractors.
    - .2 Pertinent Federal and Provincial Departments and Authorities having jurisdiction.
    - .3 Local emergency resource organizations.
  - .5 Harmonize Plan with Facility's Emergency Response and Evacuation Plan. Departmental Representative will provide pertinent data including name of Departmental Representative and Facility Management contacts.
- .4 On-site Communication Plan:
  - .1 Procedures for sharing of work related safety information to workers and subcontractors, including emergency and evacuation measures.
  - .2 List of critical work activities to be communicated with Facility Manager which have a risk of endangering health and safety of Facility users.
- .5 Address all activities of the Work including those of subcontractors.
- .6 Review Health and Safety Plan regularly during the Work. Update as conditions warrant to address emerging risks and hazards, such as whenever new trade or subcontractor arrive at Work Site.
- .7 Departmental Representative will respond in writing, where deficiencies or concerns are noted and may request re-submission of the Plan with correction of deficiencies or concerns.
- .8 Post copy of the Plan, and updates, prominently on Work Site.

#### **1.14 SAFETY SUPERVISION**

- .1 Employ Health & Safety Site Representative responsible for daily supervision of health and safety of the Work.

- .2 Health & Safety Site Representative may be the Superintendent of the Work or other person designated by Contractor and shall be assigned the responsibility and authority to:
  - .1 Implement, monitor and enforce daily compliance with health and safety requirements of the Work
  - .2 Monitor and enforce Contractor's site-specific Health and Safety Plan.
  - .3 Conduct site safety orientation session to persons granted access to Work Site.
  - .4 Ensure that persons allowed site access are knowledgeable and trained in health and safety pertinent to their activities at the site or are escorted by a competent person while on the Work Site.
  - .5 Stop the Work as deemed necessary for reasons of health and safety.
- .3 Health & Safety Site Representative must:
  - .1 Be qualified and competent person in occupational health and safety.
  - .2 Have site-related working experience specific to activities of the Work.
  - .3 Be on Work Site at all times during execution of the Work.
- .4 All supervisory personnel assigned to the Work shall also be competent persons.
- .5 Inspections:
  - .1 Conduct regularly scheduled safety inspections of the Work on a minimum bi-weekly basis. Record deficiencies and remedial action taken.
- .6 Cooperate with Facility's Occupational Health and Safety representative should one be designated by Departmental Representative.
- .7 Keep inspection reports and supervision related documentation on site.

### **1.15 TRAINING**

- .1 Use only skilled workers on Work Site who are effectively trained in occupational health and safety procedures and practices pertinent to their assigned task.
  - .2 Maintain employee records and evidence of training received. Make data available to Departmental Representative upon request.
  - .3 When unforeseen or peculiar safety-related hazard, or condition occur 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 and advise Departmental Representative verbally and in writing.
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**1.16 MINIMUM SITE SAFETY RULES**

- .1 Notwithstanding requirement to abide by federal and provincial health and safety regulations; ensure the following minimum safety rules are obeyed by persons granted access to Work Site:
  - .1 Wear appropriate PPE pertinent to the Work or assigned task; minimum being hard hat, safety footwear, safety glasses and hearing protection.
  - .2 Immediately report unsafe condition at site, near-miss accident, injury and damage.
  - .3 Maintain site and storage areas in a tidy condition free of hazards causing injury.
  - .4 Obey warning signs and safety tags.
- .2 Brief persons of disciplinary protocols to be taken for non compliance. Post rules on site.

**1.17 CORRECTION OF NON-COMPLIANCE**

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Departmental Representative will stop Work if non-compliance of health and safety regulations is not corrected in a timely manner.

**1.18 INCIDENT REPORTING**

- .1 Investigate and report the following incidents to Departmental Representative:
  - .1 Incidents requiring notification to Provincial Department of Occupational Safety and Health, Workers Compensation Board or to other regulatory Agency.
  - .2 Medical aid injuries.
  - .3 Property damage.
  - .4 Interruptions to Facility operations.
- .2 Submit report in writing.

**1.19 HAZARDOUS PRODUCTS**

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS).
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- .2 Keep MSDS data sheets for all products delivered to site.
  - .1 Post on site.
  - .2 Submit copy to Departmental Representative.
  - .3 For interior work in an occupied Facility, post additional copy in one or more publically accessible locations.

#### **1.20 BLASTING**

- .1 Blasting or other use of explosives is not permitted on site without prior receipt of written permission and instructions from Departmental Representative.

#### **1.21 CONFINED SPACES**

- .1 Abide by occupational health and safety regulations regarding work in confined spaces.
- .2 Obtain an Entry Permit in accordance with Part XI of the Canada Occupational Health and Safety Regulations for entry into an existing identified confined space located at the Facility or premises of Work.
  - .1 Obtain permit from Facility Manager
  - .2 Keep copy of permit issued.

#### **1.22 SITE RECORDS**

- .1 Maintain on Work Site copy of safety related documentation and reports stipulated to be produced in compliance with Acts and Regulations of authorities having jurisdiction and of those documents specified herein.
- .2 Upon request, make available to Departmental Representative or authorized Safety Officer for inspection.

#### **1.23 POSTING OF DOCUMENTS**

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on Work Site in accordance with Acts and Regulations of Province having jurisdiction.
  - .2 Post other documents as specified herein, including:
    - .1 Site specific Health and Safety Plan
    - .2 WHMIS data sheets
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**PART 2 - PRODUCTS**

Not applicable.

**PART 3 - EXECUTION**

Not applicable.

END

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## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

### **1.2 DEFINITIONS**

- .1 Hazardous Material: Product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to the environment or adversely affect health of persons, animals or plant life when released into the environment.
- .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

### **1.3 SUBMITTALS**

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Prior to commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative. Environmental Protection Plan is to present comprehensive overview of known or potential environmental issues which must be addressed during construction.
  - .3 Address topics at level of detail commensurate with environmental issue and required construction tasks.
  - .4 Environmental protection plan: include:
    - .1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.
    - .2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.
    - .3 Names and qualifications of persons responsible for training site personnel.
-

- .4 Descriptions of environmental protection personnel training program.
- .5 Erosion and sediment control plan which identifies type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
- .6 Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.
- .7 Spill Control Plan: including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
- .8 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
- .9 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off project site.
- .10 Contaminant prevention plan that: identifies potentially hazardous substances to be used on job site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
- .11 Waste water management plan that identifies methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.

#### **1.4 FIRES**

- .1 Fires and burning of rubbish on site not permitted.

#### **1.5 DISPOSAL OF WASTES AND HAZARDOUS MATERIALS**

- .1 Do not bury rubbish and waste materials on site. Dispose at approved landfill sites as specified in Section 01 74 21.
  - .2 Do not dispose of hazardous waste or volatile materials such as mineral spirits, paint thinner, oil or fuel into waterways, storm or sanitary sewers or waste landfill sites.
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- .3 Store, handle and dispose of hazardous materials and hazardous waste in accordance with applicable federal and provincial laws, regulations, codes and guidelines.
- .4 Dispose of construction waste materials and demolition debris, resulting from work, at approved landfill sites only. Carry out such disposal in strict accordance with provincial and municipal rules and regulations. Separate out and prevent improper disposal of items banned from landfills.
- .5 Establish methods and undertake construction practices which will minimize waste and optimize use of construction materials. Separate at source all construction waste materials, demolition debris and product packaging and delivery containers into various recycling abilities of various materials and avoid disposal of debris at landfill site(s) in a "mixed state". Where recycling firms specializing in recycling of specific materials exist, transport such materials to the recycling facility and avoid disposal at landfill sites.
- .6 Communicate with landfill operator prior to commencement of work, to determine what specific construction, demolition and renovation waste materials have been banned from disposal at the landfill and at transfer stations.

#### **1.6 DRAINAGE**

- .1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
- .2 Do not pump water containing suspended materials into waterways, sewer or drainage systems.
- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with governing regulations and requirements.
- .4 Pumped water must meet applicable federal, provincial and municipal standards before it can be discharged to a surface water body. If regulatory guidelines exceedences are noted, the Departmental Representative has the right to issue stop pumping instructions to the Contractor. Contractor will not be compensated for any delays associated with retrofitting equipment to meet guidelines.
- .5 Provide control devices such as filter fabrics, sediment traps and settling ponds to control drainage and prevent erosion of adjacent lands. Maintain in good order for duration of work.

#### **1.7 PERMITS**

- .1 All guidelines and instructions stated on permits must be strictly adhered to.
-

## **1.8 WORK ADJACENT TO WATERWAYS**

- .1 Do not operate construction equipment in waterways.
- .2 Do not use waterway beds for borrow material.
- .3 Do not dump excavated fill, waste material or debris in waterways.
- .4 At borrow sites, design and construct temporary crossings to minimize erosion to waterways in strict conformance with provincial and federal environmental regulations.
- .5 Do not skid logs or construction materials across waterways.
- .6 Do not refuel any type of equipment within 100 m of a water body. Maintain equipment in good working condition with no fluid leaks, loose hoses or fittings.
- .7 Temporary diversion ditches, approved by the Departmental Representative are to be plastic lined.

## **1.9 POLLUTION CONTROL**

- .1 Maintain temporary erosion and pollution control features installed under this contract.
  - .2 Control emissions from equipment and plant to local authorities emission requirements.
  - .3 Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.
  - .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads and around entire construction site.
  - .5 Maintain inventory of hazardous materials and hazardous waste stored on site. List items by product name, quantity and date when storage began.
  - .6 Have emergency spill response equipment and rapid clean-up kit, appropriate to work, at site. Locate adjacent to work and where hazardous materials are stored. Provide personal protective equipment as required for clean-up.
  - .7 Report, to Federal and Provincial Department of the Environment, spills of petroleum and other hazardous materials as well as accidents having potential of polluting the environment. Also notify Departmental Representative and submit a written spill report to Departmental Representative within 24 hours of occurrence.
-

- .8 Provide a floating debris containment boom whenever any of the Contractors methods of work allow for the potential of floating debris.

#### **1.10 WILDLIFE PROTECTION**

- .1 Should nests of migratory birds in wetlands be encountered during work, immediately notify Departmental Representative for directives to be followed.
- .1 Do not disturb nest site and neighbouring vegetation until nesting is completed.
- .2 Minimize work immediately adjacent to such areas until nesting is completed.
- .3 Protect these areas by following recommendations of Canadian Wildlife Service.

#### **PART 2 - PRODUCTS**

Not applicable

#### **PART 3 - EXECUTION**

Not applicable

## **PART 1 - GENERAL**

### **1.1 GENERAL REQUIREMENTS**

- .1 Be aware of security regulations pertaining to control and movement of construction personnel which are in force inside the Departmental Representative's building, and of the special rules applicable to working in the vicinity of the Departmental Representative's operations. It is the Contractor's responsibility to become familiar with and abide by such rules and regulations. Obtain such directives through the Departmental Representative.
  - .1 The Departmental Representative will coordinate a pre-construction meeting between Contractor, Facility Management and Security Personnel.
- .2 Brief all workers and sub-contractors in respect of the security regulations and ensure that they abide by all the rules and directives.
- .3 Any infraction of site security on the part of the Contractor, members of work force or any Subcontractor in his employ, could result in:
  - .1 A fine, to a maximum of \$1,000.00, being levied against the General Contractor.
  - .2 Demand immediate removal of offending party from the site.

### **1.2 PERSONNEL**

- .1 The Departmental Representative will obtain and pay for the services of security personnel, employed by the Canadian Corps of Commissionaires to provide security supervision inside BIO during the work of this contract.
  - .2 Commissionaire to also provide escort function between approved entrance door and to work area.
  - .3 Commissionaire shall report directly to the Departmental Representative. All workers shall follow security directives given by Commissionaire.
  - .4 The Departmental Representative will have the authority to ensure that a minimum of one commissionaire is present at site, however provide additional commissionaires when required to perform supervision or escort function as may be needed due to Contractor's work operations in order that no worker is left unsupervised on inside building.
-

- .5 Commissionaire must stay within the actual construction area for the entire work shift, including time periods before and after while workers are still on the premises, and provide surveillance of all workers ensuring that security rules and requirements are obeyed and to limit movement to approved work areas.
- .6 The contractor is responsible to provide Commissionaire with approved safety hard hat, safety footwear and other personnel protective equipment appropriate to work in accordance with applicable Occupational Health and Safety requirements specified.

### **1.3 SECURITY PASSES**

- .1 Visitor Tags are required for all personnel requiring access inside the building beyond the main public lobby. Such tags will be made available on application to the Security Personnel. All personnel shall sign in and out at the main lobby each day.
- .2 All persons while on site, must wear the ID tag issued to him regardless of daytime or nighttime work hours.
- .3 The Contractor is responsible to obtain visitor tags before work commences, including those required by his Subcontractors, and to continually control their distribution and use by workers. Submit request for tags as early as possible prior to commencement of work.
- .4 For the duration of this contract, anyone not in possession of the visitor tag will not be allowed access on site.
- .5 At end of project, return to Departmental Representative all tags issued to workers and to subcontractors.
- .6 Immediately report any lost, stolen or destroyed passes through the Departmental Representative to the Building's Security Personnel Manager.

### **1.4 SECURITY CONTROL LIST**

- .1 Provide a list of employee names from workforce and from sub-contractor who will be present at site during the course of work.
  - .2 List to include names, addresses and telephone number of all persons.
  - .3 Ensure commissionaire, employed by Contractor keeps list on site at all times.
-



- .4 Submit copy to Departmental Representative and make list available to Building Security.
- .5 Update list as work progresses.
- .6 Ensure that each worker can provide proof of identity upon demand, when requested by Security Personnel or by Facility Management.
- .7 Contractor's security personnel shall not allow access onto site of persons not identified on security control list.

### **1.5 BUILDING ACCESS**

- .1 Keys and door security access cards necessary for access to restricted areas may be issued at the discretion of Security Personnel. Follow all instructions in regards to use, care and disposition of all keys and access cards so issued.
- .2 Keys and security access cards given to the Commissionaire for his sole possession, as determined by Departmental Representative, shall not under any circumstances be given to any worker or sub-contractor.
- .3 Do not, under any circumstances, make or allow workers to make duplicates of keys issued.
- .4 At end of project, return to Departmental Representative all keys and access cards issued.
- .5 Immediately report to Departmental Representative any lost, stolen or destroyed keys and door security access cards.

### **1.6 SITE SECURITY**

- .1 Where work of this contract required use of a permanently locked door, it is Contractor's responsibility to ensure that door is unlocked and locked after each use or provide a competent security guard, posted at door, when door must remain open for an elongated period of time during a particular workshift.
  - .2 Notify Building Security when security doors will be used and stringently follow all directives to ensure building security is effectively maintained.
  - .3 Where work of this contract results in removal of doors or walls (providing security to the exterior or between spaces and suites), erect temporary security hoarding over openings constructed in such a way to provide the same degree of security as doors/walls removed.
-

- .4 When work must be carried out during "off-hours", notify Departmental Representative a minimum of 48 hours in advance and follow all directives regarding access and the circulation of workers. provide notice as soon as possible in order to minimize the impact on Building Security and Tenant operations.

## **PART 2 - PRODUCTS**

Not applicable

## **PART 3 - EXECUTION**

Not applicable

## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 78 00 - Closeout Submittals.

### **1.2 INSPECTION**

- .1 Facilitate Departmental Representative's access to Work. If part of Work is being fabricated at locations other than construction site, make preparations to allow access to such Work whenever it is in progress.
- .2 Give timely notice requesting inspection of Work designated for special tests, inspections or approvals by Departmental Representative or by inspection authorities having jurisdiction.
- .3 If Contractor covers or permits to be covered Work designated for special tests, inspections or approvals before such is made, uncover Work until particular inspections or tests have been fully and satisfactorily completed and until such time as Departmental Representative gives permission to proceed. Pay costs to uncover and make good such Work.
- .4 In accordance with the General Conditions, Departmental Representative may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents.

### **1.3 INDEPENDENT INSPECTION AGENCIES**

- .1 Departmental Representative will engage and pay for service of Independent Inspection and Testing Agencies for purpose of inspecting and testing portions of Work except for the following which remain part of Contractor's responsibilities:
    - .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
    - .2 Inspection and testing performed exclusively for Contractor's convenience.
    - .3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.
    - .4 Mill tests and certificates of compliance.
-

- .5      Tests as specified within various sections designated to be carried out by Contractor under the supervision of Departmental Representative.
- .6      Additional tests specified in Clause 1.4.2.
  
- .2      Where tests or inspections by designated Testing Agency reveal work not in accordance with contract requirements, Contractor shall pay costs for additional tests or inspections as Departmental Representative may require to verify acceptability of corrected work.
  
- .3      Employment of inspection and testing agencies by Departmental Representative does not relax responsibility to perform Work in accordance with Contract Documents.

#### **1.4    ACCESS TO WORK**

- .1      Furnish labour and facility to provide access to the work being inspected and tested.
  
- .2      Cooperate to facilitate such inspections and tests.
  
- .3      Make good work disturbed by inspections and tests.

#### **1.5    PROCEDURES**

- .1      Notify Departmental Representative sufficiently in advance of when work is ready for tests, in order for Departmental Representative to make attendance arrangements with Testing Agency. When directed by Departmental Representative, notify such Agency directly.
  
- .2      Submit representative samples of materials specified to be tested. Deliver in required quantities to Testing Agency. 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 on site. Provide sufficient space on site for Testing Agency's exclusive use to store equipment and cure test samples.

#### **1.6    REJECTED WORK**

- .1      Remove and replace defective Work, whether result of poor workmanship, use of defective or damaged products and whether incorporated in Work or not, which has been identified by Departmental Representative as failing to conform to Contract Documents.
-

- .2 Make good damages to existing or new work, including work of other Contracts, resulting from removal or replacement of defective work.

### **1.7 TESTING BY CONTRACTOR**

- .1 Provide all necessary instruments, equipment and qualified personnel to perform tests designated as Contractor's responsibilities herein or elsewhere in the Contract Documents.
- .2 At completion of tests, turn over two (2) copies of fully documented test reports to Departmental Representative. Additionally, obtain other copies in sufficient quantities to enable one (1) complete set of test reports to be placed in each of the maintenance manuals specified in Section 01 78 00.
- .3 Submit mill test certificates and other certificates as specified in various sections.
- .4 Submit adjustment and balancing reports for mechanical, electrical and building equipment systems specified in trade sections.
- .5 Furnish test results and mix designs as specified in various sections.

### **1.8 EQUIPMENT AND SYSTEMS**

- .1 Submit adjustment and balancing reports for electrical and building equipment systems.
- .2 Refer to Section 01 33 00 – Submittal Procedures and Divisions 25 and 26.

### **PART 2 - PRODUCTS**

Not applicable

### **PART 3 - EXECUTION**

Not applicable

## **PART 1 - GENERAL**

### **1.1 INSTALLATION AND REMOVAL**

- .1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, avenues of ingress/egress to fenced area and details of fence installation.
- .2 Identify areas which have to be gravelled to prevent tracking of mud.
- .3 Indicate use of supplemental or other staging area.
- .4 Provide construction facilities in order to execute work expeditiously.
- .5 Remove from site all such work after use.

### **1.2 CONTRACTOR'S SITE OFFICE**

- .1 Be responsible for and provide own site office, if required, including electricity, heat, lights and telephone. Locate site office as directed by Departmental Representative.

### **1.3 SITE STORAGE/LOADING**

- .1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.
- .2 Do not load or permit to load any part of Work with weight or force that will endanger Work.

### **1.4 CONSTRUCTION PARKING**

- .1 Parking will be permitted on site provided it does not disrupt performance of Work.
  - .2 Provide and maintain adequate access to project site.
  - .3 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads.
-

### **1.5 EQUIPMENT, TOOL AND MATERIALS STORAGE**

- .1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

### **1.6 SANITARY FACILITIES**

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

### **1.7 CONSTRUCTION SIGNS AND NOTICES**

- .1 Contractor or sub-contractor advertisement signboards are not permitted on site.
- .2 Only notices of safety or instructions are permitted on site.
- .3 Safety and Instruction Signs and Notices:
  - .1 Signs and notices for safety and instruction shall be in both official languages. Graphic symbols shall conform to CAN/CSA-Z321-96 (R2001).
- .4 Maintenance and Disposal of Site Signs:
  - .1 Maintain approved signs and notices in good condition for duration of project and dispose of off site on completion of project or earlier if directed by Departmental Representative.

### **1.8 PROTECTION AND MAINTENANCE OF TRAFFIC**

- .1 Provide access and temporary relocated roads as necessary to maintain traffic, including foot traffic.
  - .2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.
  - .3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs
-

- .4 Protect travelling public from damage to person and property.
- .5 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.
- .6 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
- .7 Dust control: adequate to ensure safe operation at all times.
- .8 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.
- .9 Provide snow removal during period of Work.

## **PART 2 - PRODUCTS**

Not applicable

## **PART 3 - EXECUTION**

Not applicable



## **PART 1 - GENERAL**

### **1.1 INSTALLATION AND REMOVAL**

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

### **1.2 GUARD RAILS AND BARRICADES**

- .1 Provide secure, rigid guard rails and barricades around open excavations.
- .2 Provide as required by governing authorities.

### **1.3 ACCESS TO SITE**

- .1 Provide and maintain access roads, crossings, ramps and construct runways as may be required for site access including snow clearing of work areas.

### **1.4 PUBLIC TRAFFIC FLOW**

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

### **1.5 FIRE ROUTES**

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

### **1.6 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.
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**1.7 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 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 REFERENCES**

- .1 Conform to these reference standards, in whole or in part as specifically requested in specifications.
- .2 If there is question as to whether products or systems are in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.
- .3 Cost for such testing will be born by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

### **1.2 QUALITY**

- .1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
  - .2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.
  - .3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
  - .4 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
  - .5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
  - .6 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.
-

### **1.3 AVAILABILITY**

- .1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
- .2 In event of failure to notify Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

### **1.4 STORAGE, HANDLING AND PROTECTION**

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
  - .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
  - .3 Store products subject to damage from weather in weatherproof enclosures.
  - .4 Store cementitious products clear of earth or concrete floors, and away from walls.
  - .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
  - .6 Store sheet materials and lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
  - .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
  - .8 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.
-

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

### **1.5 MANUFACTURER'S INSTRUCTIONS**

- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Departmental Representative in writing of conflicts between specifications and manufacturer's instructions, so that Departmental Representative will establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

### **1.6 QUALITY OF WORK**

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

### **1.7 CO-ORDINATION**

- .1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.
  - .2 Be responsible for coordination and placement of openings, sleeves and accessories.
-

## **1.8 REMEDIAL WORK**

- .1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.
- .2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

## **1.9 LOCATION OF FIXTURES**

- .1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.
- .2 Inform Departmental Representative of conflicting installation. Install as directed.

## **1.10 FASTENINGS**

- .1 Prevent electrolytic action between dissimilar metals and materials.
- .2 Use stainless steel fasteners and anchors for securing exterior work, unless other material is specifically requested in affected specification Section.
- .3 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
- .4 Keep exposed fastenings to a minimum, space evenly and install neatly.
- .5 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

## **1.11 FASTENINGS – EQUIPMENT**

- .1 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 316 stainless steel.
  - .2 Bolts may not project more than one diameter beyond nuts.
  - .3 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.
-

### **1.12 PROTECTION OF WORK IN PROGRESS**

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

### **1.13 EXISTING UTILITIES**

- .1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and/or building occupants.
- .2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

### **PART 2 - PRODUCTS**

Not applicable

### **PART 3 - EXECUTION**

Not applicable

## **PART 1 - GENERAL**

### **1.1 REFERENCES**

- .1 Departmental Representative's identification of existing survey control points and property limits.

### **1.2 QUALIFICATIONS OF SURVEYOR**

- .1 Qualified registered land surveyor, licensed to practice in Place of Work, acceptable to Departmental Representative.

### **1.3 SURVEY REFERENCE POINTS**

- .1 Existing base horizontal and vertical control points are designated on drawings.
- .2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.
- .3 Make no changes or relocations without prior written notice to Departmental Representative.
- .4 Report to Departmental Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- .5 Require surveyor to replace control points in accordance with original survey control.

### **1.4 SURVEY REQUIREMENTS**

- .1 Establish one temporary bench mark on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.
  - .2 Establish lines and levels, locate and lay out, by instrumentation.
  - .3 Stake for grading, fill placement and landscaping features.
  - .4 Stake slopes.
  - .5 Establish pipe invert elevations.
-



- .6 Establish foundation and column locations and floor elevations.
- .7 Establish lines and levels for structural, mechanical and electrical work.

### **1.5 EXISTING SERVICES**

- .1 Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative of findings.

### **1.6 LOCATION OF EQUIPMENT AND FIXTURES**

- .1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Inform Departmental Representative of impending installation and obtain approval for actual location.
- .4 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

### **1.7 RECORDS**

- .1 Maintain a complete, accurate log of control and survey work as it progresses.
- .2 On completion of site works, prepare a certified survey showing dimensions, locations, angles and elevations of Work.
- .3 Record locations of maintained, re-routed and abandoned service lines.

### **1.8 SUBMITTALS**

- .1 Submit name and address of Surveyor to Departmental Representative.
  - .2 On request of Departmental Representative, submit documentation to verify accuracy of field engineering work.
  - .3 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform with Contract Documents.
-

**PART 2 - PRODUCTS**

Not applicable

**PART 3 - EXECUTION**

Not applicable

## **PART 1 - GENERAL**

### **1.1 GENERAL**

- .1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
- .2 Store volatile wastes in covered metal containers, and remove from premises at end of each working day.
- .3 Prevent accumulation of wastes which create hazardous conditions.
- .4 Provide adequate ventilation during use of volatile or noxious substances.

### **1.2 MATERIALS**

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

### **1.3 CLEANING DURING CONSTRUCTION**

- .1 Maintain project grounds, and public properties in a tidy condition, free from accumulation of waste materials and debris. Clean areas on a daily basis.
- .2 Provide on site garbage containers for collection of waste materials and debris.
- .3 Remove waste materials and debris from the site or building each day.

### **1.4 FINAL CLEANING**

- .1 In preparation for acceptance of the Work perform final cleaning.
  - .2 Inspect finishes, fitments and equipment. Ensure specified workmanship and operation.
  - .3 Broom clean exterior paved and concrete surfaces; rake clean other surfaces of grounds.
-

**PART 2 - PRODUCTS**

Not applicable

**PART 3 - EXECUTION**

Not applicable

## **PART 1 - GENERAL**

### **1.1 RELATED SECTIONS**

- .1 Section 01 35 43 - Environmental Procedures.
- .2 Section 03 30 00 - Cast-in-Place Concrete.

### **1.2 WASTE MANAGEMENT PLAN**

- .1 Prior to commencement of work, prepare waste Management Workplan.
- .2 Workplan to include:
  - .1 Waste audit.
  - .2 Waste reduction practices.
  - .3 Material source separation process.
  - .4 Procedures for sending recyclables to recycling facilities.
  - .5 Procedures for sending non-salvageable items and waste to approved waste processing facility or landfill site.
  - .6 Training and supervising workforce on waste management at site.
- .3 Workplan to incorporate waste management requirements specified herein and in other sections of the Specifications.
- .4 Develop Workplan in collaboration with all subcontractors to ensure all waste management issues and opportunities are addressed.
- .5 Submit copy of Workplan to Departmental Representative for review and approval.
  - .1 Make revisions to Plan as directed by Departmental Representative.
- .6 Implement and manage all aspects of Waste Management Workplan for duration of work.
- .7 Revise Plan as work progresses addressing new opportunities for diversion of waste from landfill.

### **1.3 WASTE AUDIT**

- .1 At project start-up, conduct waste audit of:
    - .1 Site conditions identifying salvageable and non-salvageable items and waste resulting from demolition and removal work.
    - .2 Projected waste resulting from product packaging and from material leftover after installation work.
-

- .2 Develop written list. Record type, composition and quantity of various salvageable items and waste anticipated, reasons for waste generation and operational factors which contribute to waste.

#### **1.4 WASTE REDUCTION**

- .1 Based on waste audit, develop waste reduction program.
- .2 Structure program to prioritize actions, with waste reduction as first priority, followed by salvage and recycling effort, then disposal as solid waste.
- .3 Identify materials and equipment to be:
  - .1 Protected and turned over to Departmental Representative when indicated.
  - .2 Salvaged for resale by Contractor.
  - .3 Sent to recycling facility.
  - .4 Sent to waste processing/landfill site for their recycling effort.
  - .5 Disposed of in approved landfill site.
- .4 Reduce construction waste during installation work. Undertake practices which will minimize waste and optimize full use of new materials on site, such as:
  - .1 Use of a central cutting area to allow for easy access to off-cuts;
  - .2 Use of off-cuts for blocking and bridging elsewhere.
  - .3 Use of effective and strategically placed facilities on site for storage and staging of left-over or partially cut materials (such as gypsum board, plywood, ceiling tiles, insulation, etc.) to allow for easy incorporation into work whenever possible avoiding unnecessary waste.
- .5 Develop other strategies and innovative procedures to reduce waste such as minimizing the extent of packaging used for delivery of materials to site, etc.

#### **1.5 MATERIAL SOURCE SEPARATION PROCESS**

- .1 Develop and implement material source separation process at commencement of work as part of mobilization and waste management at site.
  - .2 Provide on-site facilities to collect, handle and store anticipated quantities of reusable, salvageable and recyclable materials.
    - .1 Use suitable containers for individual collection of items based on intended purpose.
    - .2 Locate to facilitate deposit but without hindering daily operations of existing building tenants.
    - .3 Clearly mark containers and stockpiles as to purpose and use.
-

- .3 Perform demolition and removal of existing structure components and equipment following a systematic deconstruction process.
  - .1 Separate materials and equipment at source, carefully dismantling, labelling and stockpiling alike items for the following purposes:
    - .1 Reinstallation into the work where indicated.
    - .2 Salvaging reusable items not needed in project which Contractor may sell to other parties. Sale of such items not permitted on site.
    - .3 Sending as many items as possible to locally available recycling facility.
    - .4 Segregating remaining waste and debris into various individual waste categories for disposal in a "non-mixed state" as recommended by waste processing/landfill sites.
- .4 Isolate product packaging and delivery containers from general waste stream. Send to recycling facility or return to supplier/manufacturer.
- .5 Send leftover material resulting from installation work for recycling whenever possible.
- .6 Establish methods whereby hazardous and toxic waste materials, and their containers, encountered or used in the course work are properly isolated, stored on site and disposed in accordance with applicable laws and regulations from authorities having jurisdiction.
- .7 Isolate and store existing materials and equipment identified for re-incorporation into the Work. Protect against damage.

## **1.6 WORKER TRAINING AND SUPERVISION**

- .1 Provide adequate training to workforce, through meetings and demonstrations, to emphasize purpose and worker responsibilities in carrying out the Waste Management Plan.
  - .2 Waste Management Coordinator: designate full-time person on site, experienced in waste management and having knowledge of the purpose and content of Waste Management Plan to:
    - .1 Oversee and supervise waste management during work.
    - .2 Provide instructions and directions to all workers and subcontractors on waste reduction, source separation and disposal practices.
  - .3 Post a copy of Plan in a prominent location on site for review by workers.
-

### **1.7 CERTIFICATION OF MATERIAL DIVERSION**

- .1 Submit to Departmental Representative, copies of certified weigh bills from authorized waste processing sites and sale receipts from recycling/reuse facilities confirming receipt of building materials and quantity of waste diverted from landfill.
- .2 Submit data at pre-determined project milestones as determined by Departmental Representative.
- .3 Compare actual quantities diverted from landfill with projections made during waste audit.

### **1.8 DISPOSAL REQUIREMENTS**

- .1 Burying or burning of rubbish and waste materials is prohibited.
  - .2 Disposal of waste, volatile materials, mineral spirits, oil, paint, paint thinner or unused preservative material into waterways, storm, or sanitary sewers is prohibited.
  - .3 Do not dispose of preservative treated wood through incineration.
  - .4 Do not dispose of preservative treated wood with other materials destined for recycling or reuse.
  - .5 Dispose of treated wood, end pieces, wood scraps and sawdust at a sanitary landfill.
  - .6 Dispose of waste only at approved waste processing facility or landfill sites approved by authority having jurisdiction.
  - .7 Contact the authority having jurisdiction prior to commencement of work, to determine what, if any, demolition and construction waste materials have been banned from disposal in landfills and at transfer stations. Take appropriate action to isolate such banned materials at site of work and dispose in strict accordance with provincial and municipal regulations.
  - .8 Transport waste intended for landfill in separated condition, following rules and recommendations of Landfill Operator in support of their effort to divert, recycle and reduce amount of solid waste placed in landfill.
-



- .9 Collect, bundle and transport salvaged materials to be recycled in separated categories and condition as directed by recycling facility. Ship materials only to approved recycling facilities.
- .10 Sale of salvaged items by Contractor to other parties not permitted on site.

## **PART 2 - PRODUCTS**

Not applicable

## **PART 3 - EXECUTION**

Not applicable

## **PART 1 - GENERAL**

### **1.1 INSPECTION AND DECLARATION**

- .1 Contractor's Inspection: Contractor and Subcontractors: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
  - .1 Notify Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
  - .2 Request Departmental Representative Inspection.
- .2 Departmental Representative Inspection: Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor to correct Work accordingly.
- .3 Completion: submit written certificate that 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 Representative.
  - .5 Work is complete and ready for final inspection.
- .4 Final Inspection: when items noted above are completed, request final inspection of Work by Departmental Representative and Contractor. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request reinspection.

### **1.2 CLEANING**

- .1 In accordance with Section 01 74 11 - Cleaning.
- .2 Remove waste and surplus materials, rubbish and construction facilities from the site in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## **PART 2 - PRODUCTS**

Not applicable

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**PART 3 - EXECUTION**

Not applicable

END

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**PART 1 - GENERAL**

**1.1 PROJECT RECORD DOCUMENTS**

- .1 Departmental Representative will provide two (2) white print sets of contract drawings and two (2) copies of Specifications Manual specifically for “as-built” purposes.
  - .2 Maintain at site one (1) set of the contract drawings and specifications to record actual as-built site conditions.
  - .3 Maintain up-to-date, real time as-built drawings and specifications in good condition and make available for inspection by the Departmental Representative at any time during construction.
  - .4 As-Built Drawings:
    - .1 Record changes in red ink on the prints. Mark only on one (1) set of prints and at completion of project and prior to final inspection, neatly transfer notations to second set (also by use of red ink). Submit both sets to Departmental Representative. All drawings of both sets shall be stamped “As-built Drawings” and be signed and dated by Contractor.
    - .2 Show all modifications, substitutions and deviations from what is shown on the contract drawings or in specifications.
    - .3 Record following information:
      - .1 Horizontal and vertical location of various elements in relation to Geodetic Datum.
      - .2 Field changes of dimension and detail.
      - .3 All design elevations, sections, and details dimensioned and marked-up to consistently report finished installation conditions.
      - .4 Any details produced in the course of the contract by the Departmental Representative to supplement or to change existing design drawings must also be marked-up and dimensioned to reflect final as-built conditions and appended to the as-built drawing document.
      - .5 All change orders issued over the course of the contract must be documented on the finished as-built documents, accurately and consistently depicting the changed condition as it applies to all affected drawing details.
  - .5 As-built Specifications: legibly mark in red each item to record actual construction, including:
    - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly items substituted from that specified.
    - .2 Changes made by Addenda and Change Orders.
-

- .3 Mark up both copies of specifications; stamp “as-built”, sign and date similarly to drawings as per above clause.
- .6 Maintain As-built documents current as the contract progresses. Departmental Representative will conduct reviews and inspections of the documents on a regular basis. Frequency of reviews will be subject to Departmental Representative’s discretion. Failure to maintain as-builts current and complete to satisfaction of the Departmental Representative shall be subject to financial penalties in the form of progress payment reductions and holdback assessments.

## **1.2 REVIEWED SHOP DRAWINGS**

- .1 Compile two (2) full sets of all reviewed shop drawings.

## **1.3 OPERATIONS AND MAINTENANCE MANUALS**

- .1 Provide three (3) copies of operations and maintenance manuals for all equipment installed in the works as applicable.

## **PART 2 - PRODUCTS**

Not applicable

## **PART 3 - EXECUTION**

Not applicable

## **PART 1 - GENERAL**

### **1.1 DESCRIPTION**

- .1 Demonstrate operation and maintenance of equipment and systems to Departmental Representative two (2) weeks prior to date of final inspection.
- .2 Departmental Representative will provide list of personnel to receive instructions, and will co-ordinate their attendance at agreed-upon times.

### **1.2 QUALITY CONTROL**

- .1 When specified in individual Sections require manufacturer to provide authorized representative to demonstrate operation of equipment and systems, instruct Departmental Representative, and provide written report that demonstration and instructions have been completed.

### **1.3 SUBMITTALS**

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit schedule of time and date for demonstration of each item of equipment and each system two weeks (2) prior to designated dates, for Departmental Representative's approval.
- .3 Submit reports within one week (1) after completion of demonstration, that demonstration and instructions have been satisfactorily completed.
- .4 Give time and date of each demonstration, with list of persons present.

### **1.4 CONDITIONS FOR DEMONSTRATIONS**

- .1 Equipment has been inspected and put into operation.
- .2 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

### **1.5 PREPARATION**

- .1 Verify that conditions for demonstration and instructions comply with requirements.
  - .2 Verify that designated personnel are present.
-

## **1.6 DEMONSTRATION AND INSTRUCTIONS**

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

## **1.7 TIME ALLOCATED FOR INSTRUCTIONS**

- .1 Ensure adequate amount of time allocated for instruction of each item of equipment or system as follows:
  - .1 Division 26 - Electrical System – ½ day.
  - .2 Division 23 – Mechanical/ Fans – 1 day.
  - .3 Division 25 – EMCS – ½ day.

## **PART 2 - PRODUCTS**

Not applicable

## **PART 3 - EXECUTION**

Not applicable

## **PART 1 - GENERAL**

### **1.1 SECTION INCLUDES**

- .1 Includes general requirements for commissioning facilities and facility systems.

### **1.2 RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.

### **1.3 QUALITY ASSURANCE**

- .1 Testing organization: current member in good standing of certified to perform specified services.
- .2 Comply with applicable procedures and standards of the certification sponsoring association.
- .3 Perform services under direction of supervisor qualified under certification requirements of sponsoring association.

### **1.4 REFERENCES**

- .1 ASHRAE Guideline 1 - Commissioning of HVAC Systems.
  - .2 Canadian Standards Association (CSA)
  - .3 National Plumbing Code of Canada (NPC) 2005.
  - .4 Underwriters' Laboratories of Canada (ULC)
  - .5 Public Works and Government Services Canada (PWGSC).
    - .1 PWGSC - Commissioning Manuals/Guidelines - 4th Edition - November 2006.
  - .6 Associated Air Balance Council (AABC): National Standards for Field Measurement and Instrumentation, Total Systems Balance, Air Distribution Hyrdonics Systems.
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**1.5 COMMISSIONING PLAN**

- .1 Refer to attached Commissioning Plan in the Appendix A.
- .2 The Commissioning Plan is to be included as part of the contract.
- .3 Submittals, reports, preparation, procedures, and other responsibilities of the Contractor are listed in the Commissioning Plan.
- .4 Commissioning Plan to be supplemented by commissioning form and test procedures contained in Division 25 Integrated Automation.

**PART 2 - PRODUCTS**

Not applicable.

**PART 3 - EXECUTION**

Not applicable.

## **PART 1 - GENERAL**

### **1.1 SUMMARY**

- .1 Section Includes:
  - .1 General requirements relating to commissioning of project's components and systems, specifying general requirements of system functional performance testing, equipment, sub-systems, systems, and integrated systems.
- .2 Related Sections:
  - .1 Appendix A - Commissioning Plan
  - .2 Section 01 91 00 - Commissioning
  - .3 Section 01 91 51 - Building Management Manual
- .3 Acronyms:
  - .1 BMM - Building Management Manual
  - .2 CPS - Commissioning Plan Schedule
  - .3 ESR - Equipment Start-Up and Acceptance Report
  - .4 O&M - Operation and Maintenance
  - .5 SFPTF - System Functional Performance Test Form
  - .6 SVF - System Verification Form
  - .7 TAB - Testing, Adjusting and Balancing
  - .8 CA - Commissioning Authority
  - .9 CCC - Contractor's Commissioning Coordinator

### **1.2 GENERAL**

- .1 Commissioning is a planned program of tests, procedures and checks carried out systematically on systems and integrated systems of the finished Project. Commissioning is performed after systems and integrated systems are completely installed, functional and Contractor's Performance Verification responsibilities have been completed and approved.
  - .2 Objectives:
    - .1 To bring mechanical and electrical systems from a state of static completion to a state of dynamic operation;
    - .2 To verify conformance to contract requirements;
    - .3 To verify installed equipment, systems and integrated systems operate in accordance with contract documents and design criteria and intent;
    - .4 To ensure that the completed facility meets user stated requirements and effectively train O&M staff; and
    - .5 To ensure appropriate documentation is compiled into the BMM.
-

- .3 The contractor shall assist in commissioning process, operating equipment and systems, troubleshooting and making adjustments as required.
  - .1 Systems to be operated at full capacity under various modes to determine if they function correctly and consistently at peak efficiency. Systems to interact with each other as intended in accordance with Contract Documents and design criteria.
  - .2 During these checks, adjustments to be made to enhance performance to meet environmental or user requirements.
- .4 Design Criteria:
  - .1 To meet Project functional and operational requirements.

### **1.3 COMMISSIONING OVERVIEW**

- .1 For commissioning responsibilities refer to Appendix A - Commissioning Plan.
- .2 Commissioning to be a line item of Contractor's cost breakdown.
- .3 Commissioning activities supplement field quality and testing procedures described in relevant technical sections.
- .4 Commissioning is conducted in concert with activities performed during stage of project delivery. Commissioning identifies issues in Planning and Design stages which are addressed during construction and commissioning 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. Commissioning activities includes transfer of critical knowledge to facility operational personnel.
- .5 Departmental Representative will issue Interim Acceptance Certificate when:
  - .1 Completed commissioning documentation has been received, reviewed for suitability and approved by Departmental Representative;
  - .2 Equipment, components and systems have been commissioned; and
  - .3 O&M training has been completed.

### **1.4 NON-CONFORMANCE TO PERFORMANCE VERIFICATION REQUIREMENTS**

- .1 Should equipment, system components, and associated controls be incorrectly installed or malfunction during commissioning, correct deficiencies, re-verify equipment and components within the un-functional system, including related systems as deemed required by Departmental Representative and CA, to ensure effective performance.
- .2 The costs for corrective work, additional tests and inspections required to determine the acceptability and proper performance of such items to be borne by

the Contractor. The above costs shall be in the form of progress payment reductions or hold-back assessments.

### **1.5 PRE-COMMISSIONING REVIEW**

- .1 Before Construction:
  - .1 Review contract documents and confirm in writing to Departmental Representative and/or CA for the following:
    - .1 Adequacy of provisions for commissioning; and
    - .2 Aspects of design and installation pertinent to success of commissioning.
  - .2 During Construction:
    - .1 Co-ordinate provision, location and installation of provisions for commissioning.
  - .3 Before Start of Commissioning:
    - .1 Have completed Commissioning Plan up-to-date;
    - .2 Ensure installation of related components, equipment, systems and sub-systems is complete;
    - .3 Fully understand commissioning requirements and procedures;
    - .4 Have commissioning documentation shelf-ready;
    - .5 Understand completely the design criteria and intent and special features;
    - .6 Submit complete start-up documentation to CA and Departmental Representative;
    - .7 Have commissioning schedules up-to-date;
    - .8 Ensure systems have been cleaned thoroughly;
    - .9 Complete TAB procedures on systems and submit TAB reports to Departmental Representative and CA for review and approval; and
    - .10 Ensure "As-Built" system schematics are available.
  - .4 Inform CA and Departmental Representative in writing of discrepancies and deficiencies on finished works.

### **1.6 CONFLICTS**

- .1 Report conflicts between requirements of this section and other sections to CA and Departmental Representative before start-up and obtain clarification.
- .2 Failure to report conflict and obtain clarification will result in application of most stringent requirement.

### **1.7 SUBMITTALS**

- .1 Submittals: in accordance with Section 01 33 00 Submittal Procedures.
  - .2 Submit no later than 3 weeks after award of Contract:
    - .1 Name of Contractor's Commissioning Authority;
-

- .2 Draft commissioning documentation; and
- .3 Preliminary commissioning schedule.
- .3 Request in writing to CA and Departmental for changes to submittals and obtain written approval at least 12 weeks prior to start of commissioning.
- .4 Submit proposed commissioning procedures to CA and Departmental Representative where not specified and obtain written approval at least 12 weeks prior to start of commissioning.
- .5 Provide additional documentation relating to Commissioning process required by CA and Departmental Representative.

### **1.8 COMMISSIONING DOCUMENTATION**

- .1 Refer to Appendix A - Commissioning Plan for System Verification Forms (SVF), Equipment Start-Up and Acceptance Reports (ESR) and System Functional Performance Test Forms (SFPTF) for requirements and instructions for use.
- .2 CA and Departmental Representative to review and approve commissioning documentation.
- .3 Provide completed and approved commissioning documentation to CA and Departmental Representative.

### **1.9 COMMISSIONING SCHEDULE**

- .1 The General Contractor and/or the CCC shall prepare and coordinate the CPS with the construction schedule, and the commissioning schedule prepared and submitted by the contractor.
- .2 The CPS will be updated every month. Copies of this schedule and updates will be distributed to:
  - .1 CA 1 copy
  - .2 PM 2 copies
  - .3 DPC 1 copy
  - .4 GC 1 copy
- .3 Contractor to provide detailed commissioning schedule as part of the construction schedule in accordance with Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart

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

#### **1.10 COMMISSIONING MEETINGS**

- .1 Purpose: to resolve issues, monitor progress, identify deficiencies relating to commissioning.
- .2 Meetings shall be regularly scheduled by the CA (generally every two weeks) in order to plan, discuss, and review commissioning activities. Continue commissioning meetings on regular basis until commissioning deliverables have been addressed.
- .3 Meetings shall take place until work has been completed.
- .4 The construction schedule, commissioning plan schedule, and the commissioning plan shall be reviewed and updated as required. Upcoming tests and equipment start-ups shall be reviewed and completed test results will be evaluated.
- .5 The CA will take minutes of meetings and distribute copies to all team members within one week of a meeting.
- .6 At 60 % construction completion stage CA and/or Departmental Representative to call a separate commissioning scope meeting to review progress, discuss schedule of equipment start-up activities and prepare for commissioning. Issues at the meeting to include:
  - .1 Review duties and responsibilities of Contractor and subcontractors, addressing delays and potential problems; and
  - .2 Determine the degree of involvement of trades and manufacturer's representatives in the commissioning process.
- .7 Meeting will be chaired by CA (Commissioning Authority) who will record and distribute minutes.
- .8 Ensure subcontractors and relevant manufacturer representatives are present at 60 % and subsequent commissioning meetings and as required.

#### **1.11 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.
-

### **1.12 WITNESSING OF STARTING AND TESTING**

- .1 Provide 14 days notice prior to commencement.
- .2 CA and CCC to witness start-up and testing.
- .3 Contractor's Commissioning Authority to be present at tests performed and documented by sub-trades, suppliers and equipment manufacturers.

### **1.13 MANUFACTURER'S INVOLVEMENT**

- .1 Factory testing:
  - .1 Equipment manufacturer to:
    - .1 Coordinate time and location of testing;
    - .2 Provide testing documentation for approval by Departmental Representative and/or CA ;
    - .3 Arrange for CA and CCC to witness tests; and
    - .4 Obtain written approval of test results and documentation from Departmental Representative before delivery to site.
- .2 Obtain manufacturers installation, start-up and operations instructions prior to start-up of components, equipment and systems and review with Departmental Representative and CA.
- .3 Compare completed installation with manufacturer's published data, record discrepancies, and review with manufacturer.
- .4 Modify procedures detrimental to equipment performance and review same with manufacturer before start-up.
- .5 Integrity of warranties:
  - .1 Use manufacturers' 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.
- .6 Qualifications of manufacturer's personnel:
  - .1 Experienced in design, installation and operation of equipment and systems;
  - .2 Ability to interpret test results accurately; and
  - .3 To report results in clear, concise, logical manner.

### **1.14 PROCEDURES**

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

- .2 Conduct start-up and testing in following distinct phases:
  - .1 Included in delivery and installation:
    - .1 Verification of conformity to specification, approved shop drawings and completion of SVF; and
    - .2 Visual inspection of quality of installation;
  - .2 Equipment Start-Up: follow accepted start-up procedures.
  - .3 Operational testing: document equipment performance.
  - .4 System Functional Performance Testing: include repetition of tests after correcting deficiencies.
  - .5 Post-substantial performance verification: to include fine-tuning.
- .3 Correct deficiencies and obtain approval from CA and Departmental Representative after distinct phases have been completed and before commencing next phase.
- .4 Document required tests on approved SFPTF forms.
- .5 Failure to follow accepted start-up procedures will result in re-evaluation of equipment by an independent testing agency selected by Departmental Representative. If results reveal that equipment start-up was not in accordance with requirements, and resulted in damage to equipment, implement following:
  - .1 Minor equipment/systems: implement corrective measures approved by Departmental Representative.
  - .2 Major equipment/systems: if evaluation report concludes that damage is minor, implement corrective measures approved by Departmental Representative.
  - .3 If evaluation report concludes that major damage has occurred, Departmental Representative shall reject equipment.
    - .1 Rejected equipment to be removed from site and replaced with new.
    - .2 Subject new equipment or systems to specified start-up procedures.

#### **1.15 START-UP DOCUMENTATION**

- .1 Assemble start-up documentation and submit to CA and Departmental Representative for approval before commencement of commissioning.
- .2 Start-up documentation to include:
  - .1 Factory and on-site test certificates for specified equipment;
  - .2 Pre-start-up inspection reports;
  - .3 Signed installation/start-up check lists;
  - .4 Start-up reports; and
  - .5 Step-by-step description of complete start-up procedures, to permit Departmental Representative to repeat start-up at any time.



**1.16 OPERATION AND MAINTENANCE OF EQUIPMENT AND SYSTEMS**

- .1 After start-up, operate and maintain equipment and systems as directed by equipment/system manufacturer.
- .2 With assistance of manufacturer develop written maintenance program and submit to Departmental Representative for approval before implementation.
- .3 Operate and maintain systems for length of time required for commissioning to be completed.
- .4 After completion of commissioning, operate and maintain systems until issuance of certificate of interim acceptance.

**1.17 TEST RESULTS**

- .1 If start-up, testing and/or SFPTF produce unacceptable results, repair, replace or repeat specified starting and/or SFPTF procedures until acceptable results are achieved.
- .2 Provide manpower and materials and assume costs for re-commissioning.

**1.18 START OF COMMISSIONING**

- .1 Notify Departmental Representative and CA at least 28 days prior to start of commissioning.
- .2 Commence commissioning after elements of building affecting start-up and performance verification of systems have been completed.

**1.19 INSTRUMENTS / EQUIPMENT**

- .1 Submit to CA and Departmental Representative for review and approval:
  - .1 Complete list of instruments proposed to be used; and
  - .2 Listed data including serial number, current calibration certificate, calibration date, calibration expiry date and calibration accuracy.
- .2 Provide all equipment and supplies as required.

**1.20 COMMISSIONING PERFORMANCE VERIFICATION**

- .1 Carry out Commissioning:
    - .1 Under actual or accepted simulated operating conditions, over entire operating range, in all modes; and
    - .2 On independent systems and interacting systems.
-

- .2 Commissioning procedures to be repeatable and reported results are to be verifiable.
- .3 Follow equipment manufacturer's operating instructions.
- .4 BAS trending to be available as supporting documentation for performance verification.

#### **1.21 WITNESSING COMMISSIONING**

- .1 CA and CCCC to witness activities and verify results.

#### **1.22 AUTHORITIES HAVING JURISDICTION**

- .1 Where specified start-up, testing or commissioning procedures duplicate verification requirements of Authority Having Jurisdiction, arrange for authority to witness procedures so as to avoid duplication of tests and to facilitate expedient acceptance of facility.
- .2 Obtain certificates of approval, acceptance and compliance with rules and regulation of Authority Having Jurisdiction.
- .3 Provide copies to Departmental Representative, CA and CCC within 5 days of test and with commissioning report.

#### **1.23 COMMISSIONING CONSTRAINTS**

- .1 Since access into secure or sensitive areas will be very difficult after occupancy it is necessary to complete commissioning of occupancy, weather, and seasonal sensitive equipment and systems in these areas before issuance of the Interim Certificate, using, if necessary, simulated thermal loads.

#### **1.24 EXTRAPOLATION OF RESULTS**

- .1 Where commissioning of weather, occupancy, or seasonal-sensitive equipment or systems cannot be conducted under near-rated or near-design conditions, extrapolate part-load results to design conditions when approved by Departmental Representative in accordance with equipment manufacturer's instructions, using manufacturer's data, with manufacturer's assistance and using approved formulae.

#### **1.25 EXTENT OF VERIFICATION**

- .1 Provide manpower and instrumentation to verify up to 100 % of reported results.
  - .2 Number and location to be at discretion of the Departmental Representative or CA.
-

- .3 Conduct tests repeated during verification under same conditions as original tests, using same test equipment and instrumentation.
- .4 Review and repeat commissioning of systems if inconsistencies are found in more than 20 % of reported results.
- .5 Perform additional commissioning until results are acceptable to Departmental Representative and CA.

#### **1.26 REPEAT VERIFICATIONS**

- .1 Assume costs incurred by Departmental Representative for third and subsequent verifications where:
  - .1 Verification of reported results fail to receive approval.
  - .2 Repetition of second verification again fails to receive approval; and
  - .3 Departmental Representative deems Contractor's request for second verification was premature.

#### **1.27 CHECKS AND ADJUSTMENTS**

- .1 Make adjustments and changes which become apparent as commissioning proceeds.
- .2 Perform static and operational checks as applicable and as required.

#### **1.28 DEFICIENCIES, FAULTS, DEFECTS**

- .1 Correct deficiencies found during start-up and commissioning to satisfaction of Departmental Representative and CA.
- .2 Report problems, faults or defects affecting commissioning to Departmental Representative and CA in writing. Stop commissioning until problems are rectified. Proceed with written approval from Departmental Representative or CA.

#### **1.29 COMPLETION OF COMMISSIONING**

- .1 Upon completion of commissioning leave systems in normal operating mode.
  - .2 Except for warranty and seasonal verification activities specified in commissioning specifications, complete commissioning prior to issuance of Interim Certificate of Completion.
  - .3 Commissioning to be considered complete when contract commissioning deliverables have been submitted and accepted by Departmental Representative.
-

### **1.30 ACTIVITIES UPON COMPLETION OF COMMISSIONING**

- .1 When changes are made to baseline components or system settings established during commissioning process, provide updated commissioning form for affected items.

### **1.31 TRAINING**

- .1 In accordance with Appendix A - Commissioning Plan.

### **1.32 MAINTENANCE MATERIALS, SPARE PARTS, SPECIAL TOOLS**

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

### **1.33 OCCUPANCY**

- .1 Cooperate fully with Departmental Representative and CA during stages of acceptance and occupancy of facility.

### **1.34 INSTALLED INSTRUMENTATION**

- .1 Use instruments installed under contract for TAB and System Functional Performance Testing if:
  - .1 Accuracy complies with these specifications; and
  - .2 Calibration certificates have been deposited with Departmental Representative and/or CA.
- .2 Calibrated EMCS sensors may be used to obtain performance data provided that sensor calibration has been completed and accepted.

### **1.35 SYSTEM FUNCTIONAL PERFORMANCE TESTING 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 to be of higher order of magnitude than equipment or system being tested
  - .3 Measurement tolerances during verification:
    - .1 Unless otherwise specified actual values to be within +/- 2 % of recorded values.
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**1.36 DEPARTMENTAL REPRESENTATIVE PERFORMANCE TESTING**

- .1 Performance testing of equipment or systems by Departmental Representative will not relieve Contractor from compliance with specified start-up and testing procedures.

**PART 2 - PRODUCTS**

Not applicable.

**PART 3 - EXECUTION**

Not applicable.

## **PART 1 - GENERAL**

### **1.1 SUMMARY**

- .1 Section Includes:
  - .1 This section is limited to portions of the Building Management Manual (BMM) provided to Departmental Representative and/or Commissioning Authority (CA) by Contractor.
- .2 Related Sections:
  - .1 Section 01 78 00 - Closeout Submittals.
  - .2 Commissioning Plan in Appendix A.
  - .3 Section 01 91 00 - Commissioning.
  - .4 Section 01 91 13 - General Commissioning (Cx) Requirements.
- .3 Acronyms:
  - .1 BMM - Building Management Manual.
  - .2 Cx - Commissioning.
  - .3 HVAC - Heating, Ventilation and Air Conditioning.
  - .4 PI - Product Information.
  - .5 PV - Performance Verification.
  - .6 TAB - Testing, Adjusting and Balancing.
  - .7 WHMIS - Workplace Hazardous Materials Information System.
  - .8 CA - Commissioning Authority.

### **1.2 GENERAL REQUIREMENTS**

- .1 Standard letter size paper 216 mm x 279 mm.
  - .2 Methodology used to facilitate updating.
  - .3 Drawings, diagrams and schematics to be professionally developed.
  - .4 Electronic copy of data to be in a format accepted and approved by Departmental Representative and/or CA.
  - .5 Two (2) hard copies and two (2) soft copies of BMM documentation to be provided to Departmental Representative and/or Cx Authority by Contractor.
  - .6 Use 50 mm three-ring D-ring binders having clear vinyl pockets on front and spine. Identify each binder with the name of the building, manual name, part number and volume number. Each binder shall be prefaced with a complete Table of Contents. Binders shall not be more than two-thirds full. Cross-reference binders and sections as necessary.
  - .7 Use of BMM during training sessions. The BMM will be available for use during training of O&M Personnel.
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- .8 BMM is to be developed at start of construction, and once given interim approval by Departmental Representative is to be kept in Contractor's trailer until ready for delivery for final acceptance by Departmental Representative.
- .9 Departmental Representative and/or CA may inspect contents and progress of BMM at regular project or Cx meetings, and may take possession of binder periodically for purposes of updating and adding documentation.

### **1.3 APPROVALS**

- .1 Prior to commencement, co-ordinate requirements for preparation, submission and approval with Departmental Representative and/or CA. Contractor and subs is subject to approval by Cx Authority prior to incorporation into the BMM.
- .2 Approval of interim BMM is by Departmental Representative upon substantial completion of project.
- .3 Final approval of BMM is by Departmental Representative upon end of warranty period.

### **1.4 GENERAL ORGANIZATION OF THE BUILDING MANAGEMENT MANUAL**

- .1 The BMM shall be organized as follows:
  - .1 List of Contents
    - .1 General Project Description
      - .1 Section 1.1: List of major project participants
      - .2 Section 1.2: General description of project
      - .3 Section 1.3: List of commissioned systems
    - .2 Design Criteria, Design Intent, Description of Building and Systems
      - .1 Section 2.1: Basis of Design Report
      - .2 Section 2.2: Design of Intent Report
    - .3 Systems Operation and Maintenance
      - .1 Section 3.1: Standard operating procedures (SOP) manual
      - .2 Section 3.2: Sequence of operations
      - .3 Section 3.3: Operating and Maintenance (O&M) Manual (provided by Subs)
    - .4 Building Management
      - .1 Section 4.1: Building documentation, cross-referenced where necessary to avoid redundancy
      - .2 Section 4.2: Maintenance and service contracts (cross reference to O&M manual)
    - .5 As-Built Manual
      - .1 Section 5.1: "As-built" construction documents, including control schedules and setpoints (cross reference to O&M manual)
      - .2 Section 5.2: Final Commissioning Reports (including Cx Plan, completed forms which are approved and signed by CA and Departmental Representative
      - .3 Recommissioning instruction forms, including list of commissioned systems, blank prefunctional and FPT test forms, recommend schedule for recommissioning.

- .6 Training manual
  - .1 Training Plan (completed and signed by all participants of training)
- .7 Life Safety Compliance (LSC) Manual
  - .1 Please refer to Section 1.6 of this specification for specific content

## **1.5 GENERAL INFORMATION**

- .1 Provide Departmental Representative the following for insertion into appropriate Part and Section of BMM:
  - .1 Complete list of names, addresses, telephone and fax numbers of contractor, sub-contractors that participated in delivery of project - as indicated in Section 1.2 of BMM.
  - .2 Summary of architectural, structural, fire protection, mechanical and electrical systems installed and commissioned - as indicated in Section 1.4 of BMM.
    - .1 Including sequence of operation as finalized after commissioning is complete as indicated in Section 2.0 of BMM.
  - .3 Description of building operation under conditions of heightened security and emergencies as indicated in Section 2.0 of BMM.
  - .4 System, equipment and components Maintenance Management System (MMS) identification - Section 2.1 of BMM.
  - .5 Information on operation and maintenance of architectural systems and equipment installed and commissioned - Section 2.0 of BMM.
  - .6 Information on operation and maintenance of fire protection and life safety systems and equipment installed and commissioned - Section 2.0 of BMM.
  - .7 Information on operation and maintenance of mechanical systems and equipment installed and commissioned - Section 2.0 of BMM.
  - .8 Operating and maintenance manual - Section 3.2 of BMM.
  - .9 Final commissioning plan as actually implemented.
  - .10 Completed commissioning checklists.
  - .11 Commissioning test procedures employed.
  - .12 Completed Product Information (PI) and Performance Verification (PV) report forms, approved and accepted by Departmental Representative.
  - .13 Commissioning reports.

## **1.6 CONTENTS OF OPERATING AND MAINTENANCE MANUAL**

- .1 For detailed requirements refer to Section 01 78 00 - Closeout Submittals.
  - .2 Departmental Representative to review and approve format and organization within 12 weeks of award of contract.
  - .3 Include original manufactures brochures and written information on products and equipment installed on this project.
  - .4 Record and organize for easy access and retrieval of information contained in BMM.
  - .5 Include completed PI report forms, data and information from other sources as required.
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- .6 Inventory directory relating to information on installed systems, equipment and components.
- .7 Approved project shop-drawings, product and maintenance data.
- .8 Manufacturer's data and recommendations relating: manufacturing process, installation, commissioning, start-up, O&M, shutdown and training materials.
- .9 Inventory and location of spare parts, special tools and maintenance materials.
- .10 Warranty information.
- .11 Inspection certificates with expiration dates, which require on-going re-certification inspections.
- .12 Maintenance program supporting information including:
  - .1 Recommended maintenance procedures and schedule.
  - .2 Information to removal and replacement of equipment including, required equipment, points of lift and means of entry and egress.

#### **1.7 LIFE SAFETY COMPLIANCE (LSC) MANUAL**

- .1 Samples of LSC Manual will be available from Departmental Representative and/or CA.
- .2 Content of Manual:
  - .1 All possible Emergency situations modes including: presence of fire and smoke, power failure, lose of water or pressure, chemical spills and refrigerant release.
  - .2 Failure of elevators and escalators.
  - .3 HVAC emergencies and fuel supply failures.
  - .4 Intrusion and security breach.
  - .5 Emergency provisions for natural disasters, bomb threats and other disruptive situations.
  - .6 Dedicated emergency generators for high security projects, medical facilities and computer systems.
  - .7 Emergency control procedures for fire, power and major equipment failure.
  - .8 Emergency contacts and numbers.
  - .9 Manual to be readily available and comprehensible to non- technical readers.

#### **1.8 SUPPORTING DOCUMENTATION FOR INSERTION INTO BUILDING MANAGEMENT MANUAL**

- .1 Provide Departmental Representative and/or CA supporting documentation relating to installed equipment and system, including:
    - .1 General:
      - .1 Finalized commissioning plan.
      - .2 WHMIS information manual.
      - .3 Approved "as-built" drawings and specifications.
      - .4 Procedures used during commissioning.
      - .5 Cross-Reference to specification sections.
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- .2 Architectural and structural:
    - .1 Inspection certificates, construction permits.
    - .2 Roof anchor log books.
    - .3 PV reports.
  - .3 Fire prevention, suppression and protection:
    - .1 Test reports.
    - .2 Smoke test reports.
    - .3 PV reports.
  - .4 Mechanical:
    - .1 Installation permits, inspection certificates.
    - .2 Piping pressure test certificates.
    - .3 Ducting leakage test reports.
    - .4 TAB and PV reports.
    - .5 Charts of valves and steam traps.
    - .6 Copies of posted instructions.
  - .5 Electrical:
    - .1 Installation permits, inspection certificates.
    - .2 TAB and PV reports.
    - .3 Electrical work log book.
    - .4 Charts and schedules.
    - .5 Locations of cables and components.
    - .6 Copies of posted instructions.
  - .6 Additional information identified in Appendix A - Commissioning Plan.
- .2 Assist Departmental Representative and/or CA with preparation of BMM.

## **1.9 IDENTIFICATION OF FACILITY**

- .1 When submitting information to Departmental Representative and/or Cx Authority for incorporation into BMM, use following system for identification of documentation, provided by Departmental Representative and/or CA.

## **1.10 USE OF CURRENT TECHNOLOGY**

- .1 Use current technology for production of documentation. Emphasis on ease of accessibility at all times, maintain in up-to-date state, compatibility with user's requirements.
- .2 Obtain Departmental Representative's and/or CA's approval before starting Work.

## **PART 2 - PRODUCTS**

Not applicable.

## **PART 3 - EXECUTION**

Not applicable.