



PSPC

AAFC Fredericton Substation Electrical Upgrades

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PART 1 - GENERAL

1.1 DESCRIPTION OF
WORK

- .1 The Work takes place at the AAFC main research facility at 850 Lincoln Road in Fredericton, New Brunswick. In general, the Work of this contract consists of:
 - .1 The construction of underground and overhead electrical distribution infrastructure including poles, overhead wiring, primary and secondary grounding, roadway lighting, concrete encased ductbanks and manholes, reinstatement of all disturbed surfaces to pre-construction condition and all other work as shown on the project drawings and as specified herein.

1.2 FAMILIARIZATION
WITH SITE

- .1 Before submitting a bid, it is recommended that bidders visit the site to review and verify the form, nature and extent of the work, materials needed, the means of access and the temporary facilities required to perform the Work.
- .2 Obtain prior permission from the Departmental Representative before carrying out such site inspection.

1.3 CODES AND
STANDARDS

- .1 Perform work in accordance with the National Building Code of Canada (NBC), the Fire Code of Canada (NFC) and NFPA 101 Life Safety Code, and any other code of provincial or local application, including all amendments up to bid closing date, provided that in any case of conflict or discrepancy, the more stringent requirement shall apply.
- .2 Materials and workmanship must meet or exceed requirements of specified standards, codes and referenced documents.

1.4 INTERPRETATION
OF DOCUMENTS

- .1 For Federal Government projects, Division 01 Sections take precedence over technical specification sections in other Divisions of this Specification.

1.5 COST BREAKDOWN

- .1 Before submitting first progress claim submit breakdown of Contract Amount in detail as directed by the Departmental Representative and aggregating contract amount. Required forms will be provided for application of progress payment.
- .2 List items of work numerically following the same division/section number system of the specification manual and thereafter sub-divide into major work components and building systems as directed by the Department Representative.
- .3 Upon approval, cost breakdown will be used as basis for progress payment.

1.6 DOCUMENTS
REQUIRED

- .1 Maintain at job site, one (1) copy each of the following:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda and amendments.
 - .4 Reviewed Shop Drawings.
 - .5 List of outstanding shop drawings.
 - .6 Change Orders.
 - .7 Other modifications to Contract.
 - .8 Field Test Reports.
 - .9 Copy of Approved Work Schedule.
 - .10 Health and Safety Plan and other safety related documents.
 - .11 Other documents as stipulated elsewhere in the Contract Documents.

1.7 PERMITS

- .1 In accordance with the General Conditions, obtain and pay for building permit, certificates, licenses and other permits as required by municipal, provincial and federal 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.

1.7 PERMITS
(Cont'd)

- .4 Submit to Departmental Representative a copy of application forms and approval documents received from above referenced authorities.

1.8 ALTERATIONS,
ADDITIONS OR
REPAIRS TO EXISTING
BUILDING

- .1 Execute work with least possible interference or disturbance to building operations, occupants, public and normal use of premises. Arrange with the Departmental Representative to facilitate execution of work.
- .2 Where security has been reduced by work of Contract, provide temporary means to maintain security.
- .3 Provide temporary dust screens, barriers, warning signs in locations where renovation and alteration work is adjacent to areas which will be operative during such work.

1.9 ROUGHING-IN

- .1 Be responsible for obtaining manufacturer's literature and for correct roughing-in and hook-up of equipment, fixtures and appliances.

1.10 CUTTING,
FITTING AND
PATCHING

- .1 Confirm cutting and patching required by all trades is included in total bid amount submitted for the Work.
- .2 Execute cutting, fitting and patching required to make work fit properly.
- .3 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.
- .4 Do not cut, bore, or sleeve load-bearing members, except where specifically approved by Departmental Representative.
- .5 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.
- .6 Fit work airtight to pipes, sleeves ducts and conduits.

1.11 LOCATION OF
FIXTURES

- .1 Location of equipment, fixtures and outlets, shown or specified shall be considered as approximate. Actual location shall be as required to suit conditions at time of installation and as is reasonable.
- .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 the Departmental Representative when impending installation conflicts with other new or existing components. Follow directives for actual location.
- .4 Submit field drawings to indicate relative position of various services and equipment when required by the Departmental Representative.

1.12 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 tenant operations.
- .2 Before commencing work, establish location and extent of service lines in area of work and notify the Departmental Representative of findings.
- .3 Submit schedule to and obtain approval from the Departmental Representative for any shut-down or closure of active service or facility. This includes disconnection of electrical power and communication services to tenant's operational areas. Adhere to approved schedule and provide notice to affected parties.
- .4 Provide temporary services, when directed by the Departmental Representative, to maintain critical building and tenant systems.
- .5 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.
- .6 Where unknown services are encountered, immediately advise the Departmental Representative and confirm findings in writing.

1.12 EXISTING
SERVICES
(Cont'd)

- .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.

1.13 BUILDING
SMOKING ENVIRONMENT

- .1 Comply with smoking restrictions.

1.14 PHOTOGRAPHS

- .1 Prior to the commencement of the Work, the Departmental Representative may arrange for photographs to be taken of the site of the work and those properties adjacent to the site of the work. Be present or have an authorized representative present during the taking of photographs to make any comments on the conditions of the site. These photographs, together with the written report on the condition of existing roads, trees etc. as determined by mutual agreement between the Contractor and Departmental Representative, will be retained by the Departmental Representative as a record of site conditions prior to commencement of Work.

1.15 TRAFFIC
CONTROL

- .1 Provide traffic control in accordance with Work Area Traffic Control Manual - New Brunswick.
- .2 In urban areas, consult with local authorities having jurisdiction for possible additional or special requirements.
- .3 Meet with local authorities having jurisdiction prior to start of construction to determine allowable diversion of vehicle and pedestrian traffic, and access to construction area.
- .4 Provide traffic control personnel, signals, lights and other traffic control methods where required.
- .5 Provide and maintain signs, delineators, barricades, barriers, and miscellaneous warning devices to indicate construction activities or other temporary and unusual conditions.

PART 1 - GENERAL

1.1 SUBMITTALS

- .1 Upon acceptance of bid and prior to commencement of work, submit to Departmental Representative the following work management documents:
 - .1 Work Schedule as specified herein.
 - .2 Shop Drawing Submittal Schedule specified in section 01 33 00.
 - .3 Waste Management Plan specified in section 01 74 22.
 - .4 Health and Safety Plan specified in section 01 35 29.
 - .5 Lockout Procedures specified in section 01 35 25.
 - .6 Dust Control Plan specified in section 01 50 00.
 - .7 List of workers requiring security clearance and those to be placed on Site Security Control list as specified in section 01 35 54.

1.2 WORK SCHEDULE

- .1 Upon acceptance of bid submit:
 - .1 Preliminary work schedule within seven (7) calendar days of contract award.
 - .2 Detailed work schedule within twenty-one (21) calendar days of contract award.
- .2 Schedule to indicate all calendar dates from commencement to completion of all work within the time stated in the accepted bid.
- .3 Provide sufficient details in preliminary 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.
- .4 Preliminary work schedule content to include as a minimum the following:
 - .1 Bar (GANTT) Charts, indicating all work activities, tasks and other project elements, their anticipated durations, planned dates for achieving key activities and major project milestones supported with;

1.2 WORK SCHEDULE
(Cont'd)

- .4 (Cont'd)
 - .2 Written narrative on key elements of work illustrated in bar chart, providing sufficient details to demonstrate a reasonable implementation plan for completion of project within designated time.
 - .3 Generally Bar Charts derived from commercially available computerized project management system are preferred but not mandatory.
- .5 Detailed Work Schedule:
 - .1 Prepare by use of Critical Path Method (CPM) indicating:
 - .1 Complete and detailed sequence of all construction activities. Show projected start and completion dates for each activity.
 - .2 Number of calendar days required to carryout each activity.
 - .3 Critical path items with resulting critical dates, non-critical activities and resulting float time.
 - .4 Actual workdays from non-working days such as weekend and statutory days etc.
 - .5 Projected and actual percentage of work completed for each major work activity.
 - .2 Prepare CPM schedule by use of well recognized and widely used electronic software. Submit copy of schedule in paper format and one electronic version on diskette for each submission.
 - .3 Accompany CPM with written narrative as required and in sufficient detail to fully describe work and demonstrate a reasonable implementation plan for completion of project within designated time.
- .6 Work schedule must take into consideration and reflect the work phasing, required sequence of work, special conditions and operational restrictions as specified below and indicated on drawings.
- .7 Schedule work in cooperation with the Departmental Representative. Incorporate within Detailed Work Schedule, items identified by Departmental Representative during review of preliminary schedule.

1.2 WORK SCHEDULE
(Cont'd)

- .8 Completed schedule shall be approved by Departmental Representative. When approved, take necessary measures to complete work within scheduled time. Do not change schedule without Departmental Representative's approval.
- .9 Confirm all subtrades and subcontractors are made aware of the work restraints and operational restrictions specified.
- .10 Schedule Updates:
 - .1 Submit when requested by Departmental Representative.
 - .2 Provide information and pertinent details explaining reasons for necessary changes to implementation plan.
 - .3 Identify problem areas, anticipated delays, impact on schedule and proposed corrective measures to be taken.
- .11 Departmental Representative will make interim reviews and evaluate progress of work based on approved schedule. Frequency of such reviews will be as decided by Departmental Representative. Address and take corrective measures on items identified by reviews and as directed by Departmental Representative. Update schedule accordingly.
- .12 In every instance, change or deviation from the Work Schedule, no matter how minimal the risk or impact on safety or inconvenience to tenant or public might appear, will be subject to prior review and approval by the Departmental Representative.

1.3 FACILITY
RESTRICTIONS

- .1 Be aware that Facility must be kept operational for the full duration of work of this contract. Building services to areas under use by tenants must also be maintained at all times during the Facility's operational hours and as specifically defined in operational restrictions specified in this section.
- .2 The electrical installation is to be clean and commissioned at the end of each shift so that the area is fully operational.

1.4 OPERATIONAL
RESTRICTIONS

- .1 Perform the work with utmost regard to the safety and convenience of building occupants and users. All work activities must be planned and scheduled with this in mind. The Contractor will not be permitted to disturb any portion of the building without providing temporary facilities as necessary to ensure safe and direct passage through disturbed or otherwise affected areas.
- .2 Contractor to meet with the Departmental Representative on a weekly basis to identify intended work areas, activities and scheduling for the coming week.
- .3 To assure that construction work may proceed productively without risk to safety of building occupants and the public, and due to the nature of the tenant's operation be aware that certain work of this contract must be carried out during "Off-Hours".
- .4 All Work requiring electrical shut down must be completed during off-hours and must be coordinated through the Departmental Representative.
- .5 Off Hours: means a period of time which is outside the daily operational hours of the tenants of the Facility. For the purposes of this contract, Off-Hours are defined as follows:
 - .1 Weeknight Off-Hours: between the hours of 18:00 and 06:00 for each weekday Monday to Thursday inclusive.
 - .2 Weekend Off-Hours: between the hours of 18:00 Friday evening to 06:00 Monday morning.
 - .3 Dependent on the nature and location of the construction activity and due to an unanticipated operational requirement of the Tenant, certain off-hour periods may be redefined by adjusting the start and end time periods or cancellation of a specific off-hour workshift during the course of the Work.
- .6 Departmental Representative reserves the right to stop certain daytime work activities, if the nature of that activity generates excessive noise or dust and have Contractor re-schedule that particular work to be performed during the Off-Hour period.

1.4 OPERATIONAL
RESTRICTIONS
(Cont'd)

- .7 Make all trades are aware of the "Off-Hour" requirements of this Contract and ensure that any extra costs incurred as a result is included in the Contractor's bid amount for the work. No extra cost will be paid due to failure by General Contractor or their sub-contractors to recognize the off-hour requirements and other restrictions specified herein and to include all necessary allowances within their bids.
- .8 See Section 01 35 54 in regards to:
 - .1 Special security requirements which must be observed in the course of work.
 - .2 Provision of security personnel by Contractor as part of the Work.
- .9 Safety Signage:
 - .1 Provide on site, and erect as required during progress of work, proper bilingual, gender neutral signage, mounted on self-supporting stands, warning the public and building occupants of construction activities in progress and alerting need to exercise caution in proceeding through disturbed areas of the facility, and directing building occupants through any detours which may be required.
 - .2 Signage to be professionally printed and mounted on wooden backing, coloured and to express messages as directed by the Departmental Representative.
 - .3 Generally maximum size of sign should be in the order of 1.0 square meters. Number of signs required will be dependent on number of areas in facility under renovation at any one time.
 - .4 Include costs for the supply and installation of these signs in the bid amount.
- .10 Dust and Dirt Control:
 - .1 See Section 01 50 00 and 01 74 11 for dust control and cleaning requirements.
 - .2 Effectively plan and implement dust control measures and cleaning activities as an integral part of all construction activities. Review all measures with the Departmental Representative before undertaking work, especially for major dust generating activities.
 - .3 Do not allow demolition debris and construction waste to accumulate on site and contribute to the propagation of dust.

1.4 OPERATIONAL
RESTRICTIONS
(Cont'd)

- .10 (Cont'd)
- .4 As work progresses, maintain construction areas in a tidy condition at all times. Remove gross dust accumulations by cleaning and vacuuming immediately following the completion of any major dust generating activity.
 - .5 Immediately remove all debris and dust from within occupied areas as generated by work therein during a given workshift.
 - .6 Avoid situations and practices which results in dust and dirt being brought from the construction areas or from the exterior and tracked into other areas off-site.
 - .7 Inform workers and make them sensitive to the need for dust and dirt control. Stringently enforce rules and regulations, immediately address non-compliance.
 - .8 Keep access doors to work areas closed at all times. Use only designated doors for entry or egress.

1.5 PROJECT
MEETINGS

- .1 Schedule and administer project meetings, held on a minimum of every two (2) weeks, for entire duration of work and more often when directed by the Departmental Representative as deemed necessary due to progress of work or particular situation.
- .2 Prepare agenda for meetings.
- .3 Notify participants in writing four (4) days in advance of meeting date.
 - .1 Ensure attendance of all subcontractors.
 - .2 Departmental Representative will provide list of other attendees to be notified.
- .4 Hold meetings at project site or where approved by Departmental Representative.
- .5 Preside at meetings and record minutes.
 - .1 Indicate significant proceedings and decisions. Identify action items by parties.
 - .2 Distribute to participants by email within three (3) calendar days after each meeting.
 - .3 Make revisions as directed by Departmental Representative.

1.5 PROJECT
MEETINGS
(Cont'd)

- .5 (Cont'd)
.4 Departmental Representative will advise whether submission of minutes by email is acceptable. Decision will be based on compatibility of software among participants.

1.6 WORK
COORDINATION
COORDINATION

- .1 Coordinate the work of the various trades and predetermining where the work of such trades interfaces with each other.
.1 Designate one person from own employ having overall responsibility to review contract documents and shop drawings, plan and manage such coordination.
- .2 Convene meetings between trades whose work interfaces and confirm they are fully aware of the areas and the extent of where interfacing is required.
.1 Provide each trade with the plans and specs of the interfacing trade, as required, to assist them in planning and carrying out their respective work.
.2 Develop coordination drawings when deemed required illustrating potential interference between work of various trades and distribute to all affected parties including structural trade.
.1 Pay particularly close attention to overhead work above ceilings and within or near to building structural elements.
.2 Coordination drawings to identify all building elements, services lines, rough-in points and indicate from where various services are coming.
.3 Review coordination drawings at purposely called meetings. Have subcontractors sign-off on drawings and publish minutes of each meeting.
.4 Plan and coordinate work in such a way to minimize quantity of service line offsets.
.5 Submit copy of coordination drawings and meeting minutes to Departmental Representative for information purposes.
- .3 Submission of shop drawings and ordering of prefabricated equipment or prebuilt components shall only occur once coordination meeting for such items has taken place between trades and all conditions affecting the work of the interfacing trades has been made known and accounted for.

1.6 WORK
COORDINATION
(Cont'd)

- .4 Work Cooperation:
 - .1 Maintain cooperation between trades in order to facilitate the general progress of the work and avoid situations of spatial interference.
 - .2 Verify each trade provides all other trades reasonable opportunity for the completion of the work and in such a way as to prevent unnecessary delays, cutting, patching and the need to remove and replace completed work.
- .5 No extra costs to the Contract will be considered by the Departmental Representative as a result of Contractor's failure to effectively coordinate all portions of the 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 to be resolved at own cost.

PART 1 - GENERAL

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|-------------------------|----|--|
| 1.1 RELATED
SECTIONS | .1 | Section 01 45 00: Testing and Quality Control. |
| | .2 | Section 01 78 00: Closeout Submittals. |
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|--|----|---|
| 1.2 SUBMITTAL
GENERAL
REQUIREMENTS | .1 | Submit to the Departmental Representative for review requested submittals specified in various sections of the specifications including shop drawings, samples, permits, compliance certificates, test reports, work management plans and other data required as part of the work. |
| | .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 have been reviewed. |
| | .4 | Present shop drawings, product data, samples and mock-ups in SI Metric units. |
| | .5 | Where items or information is not produced in SI Metric units, provide soft converted values. |
| | .6 | Review submittals prior to submission. Ensure that necessary requirements have been determined and verified 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 | Verify field measurements and affected adjacent Work are coordinated. |
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1.2 SUBMITTAL
GENERAL
REQUIREMENTS
(Cont'd)

- .8 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .9 Contractor's responsibility for errors, omissions or deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative's review.
- .10 Submittal format:
 - .1 Submit paper originals, or alternatively clear and fully legible photocopies of originals. Facsimiles are not acceptable, except in special circumstances pre-approved by Departmental Representative. Poorly printed non-legible photocopies or facsimiles will not be accepted and be returned for resubmission.
 - .2 Submit in electronic format as pdf files. Forward pdf and in the native program format, such as MS Word, MS Excel, MS Project and Autocad dwg as well photograph jpg files on USB compatible with PSPC encryption requirements or through email or alternate electronic file sharing service such as ftp, as directed by Departmental Representative.
- .11 Make changes or revision to submissions which Departmental Representative may require, consistent with Contract Documents and resubmit as directed by Departmental Representative. When resubmitting, identify in writing of any revisions other than those requested.
- .12 Keep one reviewed copy of each submittal document on site for duration of Work.

1.3 SHOP DRAWINGS
AND PRODUCT DATA

- .1 The term "shop drawings" means fabrication drawings, erection drawings, diagrams, illustrations, schedules, performance charts, technical product data, brochures, specifications, test reports installation instructions and other data which are to be provided by Contractor to illustrate compliance with specified materials and details of a portion of work.
- .2 Shop Drawing Submittal Schedule:

1.3 SHOP DRAWINGS
AND PRODUCT DATA
(Cont'd)

- .2 (Cont'd)
 - .1 Submit within ten (10) working days of acceptance of bid a schedule listing all shop drawings to be submitted for project.
 - .2 Schedule to be in format acceptable to Departmental Representative and indicate proposed submission date for each item, status of review and anticipated product delivery date to site. Track all submissions for entire project.
 - .3 Revise schedule as work progresses. Identify items which have been reviewed and finalized and indicating those outstanding.
 - .4 Update schedule at stipulated dates or project time intervals predetermined and agreed upon with Departmental Representative at commencement of Work.
- .3 Shop Drawing Quantities: submit one (1) electronic copy in pdf format for each requirement requested in specification and as the Departmental Representative may reasonably request.
- .4 Shop Drawings Format:
 - .1 Electronic file in pdf format.
 - .2 Product Data from manufacturer's standard catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products, to be original full colour brochures, clearly marked indicating applicable data and deleting information not applicable to project.
 - .3 Non or poorly legible drawings, photocopies or facsimiles will not be accepted and returned not reviewed.
- .5 Shop Drawings Content:
 - .1 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where items or equipment attach or connect to other items or equipment, confirm that all interrelated work have been coordinated, regardless of section or trade from which the adjacent work is being supplied and installed.
 - .2 Supplement manufacturer's standard drawings and literature with additional information to provide details applicable to project.
 - .3 Delete information not applicable to project on all submittals.

1.3 SHOP DRAWINGS
AND PRODUCT DATA
(Cont'd)

- .5 (Cont'd)
 - .4 Equipment installation/start-up data: include manufacturer's recommended installation instructions, pre-start and start-up checklists for those pieces of equipment and systems designated to be commissioned.
- .6 Allow 14 calendar days for Departmental Representative's review of each submission.
- .7 Adjustments or corrections made on shop drawings by Departmental Representative are not intended to change Contract Amount. If adjustments affect value of Work, advise Departmental Representative in writing prior to proceeding with Work.
- .8 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections and comments are made, fabrication and installation may proceed upon receipt of shop drawings. If shop drawings are rejected and noted to be Resubmitted, do not proceed with that portion of work until resubmission and review of corrected shop drawings, through same submission procedures indicated above.
- .9 Be advised that costs and expenses incurred by Departmental Representative to conduct more than one review of incorrectly prepared shop drawing submittal for a particular material, equipment or component of work may be assessed against the Contractor in the form of a financial holdback to the Contract.
- .10 Accompany each submissions with transmittal letter, containing:
 - .1 Date.
 - .2 Project title and project number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
- .11 Submissions shall include:
 - .1 Date and revision dates.
 - .2 Project title and project number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.

1.3 SHOP DRAWINGS
AND PRODUCT DATA
(Cont'd)

- .11 (Cont'd)
 - .4 Contractor's stamp, signed by Contractor's authorized Representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents. Forwarding of unreviewed vendor emails is not permitted.
 - .5 Cross references to particular details of contract drawings and specifications section number for which shop drawing submission addresses.
 - .6 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.
 - .12 After Departmental Representative's review, distribute copies.
 - .13 The review of shop drawings by the Departmental Representative or by an authorized consultant or their designate is for sole purpose of ascertaining conformance with general concept. This review shall not mean that Canada approves the detail design inherent in the 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 all requirements of the construction and Contract Documents. 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 all sub-trades.
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- .1 Submit for review samples as specified in respective specification Sections. Label samples with origin and intended use.

1.4 SAMPLES

1.4 SAMPLES
(Cont'd)

- .2 Deliver samples to Departmental Representative's office or to other address as directed. Do not drop off samples at construction site except for pre-approved circumstances previously approved by Departmental Representative.
- .3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by Departmental Representative are not intended to change Contract Amount. If adjustments will result in a cost increase to the Contract notify Departmental Representative in writing prior to proceeding with Work.
- .6 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

PART 1 - GENERAL

1.1 SECTION INCLUDES

- .1 Fire Safety Requirements.
- .2 Hot Work Permit.
- .3 Existing Fire Protection and Alarm Systems.

1.2 RELATED SECTIONS

- .1 Section 01 35 29: Health and Safety Requirements.

1.3 REFERENCES

- .1 Fire Protection Standards issued by Fire Protection Services, Labour Program Division of Service Canada:
 - .1 FCC No. 301-June 1982 Standard for Construction Operations.
 - .2 FCC No. 302-June 1982 Standard for Welding and Cutting.
- .2 FCC standards may be viewed at:
http://www.hrsdc.gc.ca/eng/labour/fire_protection/policies_standards/commissioner/inde.shtml
 - .1 Fire Protection Services - Atlantic Region office, Halifax, N.S, Tel. 902-426-6053.

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.
 - .4 Use of open flame torches such as for roofing work.

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 of acceptance of bid.
- .2 Submit in accordance with section 01 33 00.

1.6 FIRE SAFETY
REQUIREMENTS

- .1 Implement and follow fire safety measures during Work. Comply with the following:
 - .1 National Fire Code 2015.
 - .2 Fire Protection Standards FCC 301 and FCC 302.
 - .3 Federal and Provincial Occupational Health and Safety Acts and Regulations.
- .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 the Departmental Representative's written "Authorization to Proceed" before conducting any form of Hot Work on site.
- .2 To obtain authorization 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 and followed during performance of hot work, Departmental Representative will give authorization to proceed as follows:
 - .1 Issue one written "Authorization to Proceed" covering the entire project for duration of work or;
 - .2 Subdivide the work into pre-determined, individual activities, each activity requiring a separately written authorization to proceed.
- .4 Requirement for individual authorization will be 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.

1.7 HOT WORK
AUTHORIZATION
(Cont'd)

- .5 Do not perform any Hot Work until receipt of Departmental Representative's written "Authorization to Proceed" for that portion of work.
- .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 the 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 Hot Work Procedures to include:
 - .1 Requirement to perform hazard assessment of site and immediate work area beforehand for each hot work event in accordance with Safety Plan specified in section 01 35 29.
 - .2 Use of a Hot Work Permit system with individually issued permit by Contractor's Superintendent to worker or subcontractor granting permission to proceed with Hot Work.
 - .3 Permit required for each Hot Work event.
 - .4 Designation of a person on site as a Fire Safety Watcher responsible to conduct a fire safety watch for a minimum duration of 60 minutes immediately following the completion of the Hot Work.
 - .5 Compliance with fire safety codes, standards and occupational health and safety regulations specified.
 - .6 Site specific rules and procedures in force at the site as provided by the Facility Manager.
- .3 Generic procedures, if used, must be edited and supplemented with pertinent information tailored to reflect specific project conditions. Label document as being the Hot Work Procedures for this contract.
- .4 Procedures must clearly establish responsibilities of:
 - .1 Worker performing hot work,
 - .2 Person issuing the Hot Work Permit,
 - .3 Fire Safety Watcher,
 - .4 Subcontractor(s) and Contractor.

1.8 HOT WORK PROCEDURES (Cont'd) .5 Brief all workers and subcontractors on Hot Work Procedures and of Permit system. Stringently enforce compliance.

1.9 HOT WORK PERMIT .1 Hot Work Permit to including the following:

- .1 Project name and project number;
- .2 Building name and specific room or area where hot work will be performed;
- .3 Date of issue;
- .4 Description of hot work type needed;
- .5 Special precautions to be followed, including type of fire extinguisher needed;
- .6 Name and signature of permit issuer.
- .7 Name of worker to which the permit is issued.
- .8 Permit validity period not to exceed 8 hours. Indicate start time/date and termination time/date.
- .9 Worker's signature with time/date of hot work completion.
- .10 Stipulated time period of safety watch.
- .11 Fire Safety Watcher's signature with time/date.

.2 Permit to be 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, signed and returned to Contractor's Superintendent for safe keeping on site.

1.10 FIRE PROTECTION AND ALARM SYSTEMS .1 Fire protection and alarm systems shall not be:

- .1 Obstructed.
- .2 Shut-off, unless approved by the Departmental Representative.
- .3 Left inactive at the end of a working day or shift.

.2 Do not use fire hydrants, standpipes and hose systems for purposes other than fire fighting.

.3 Costs incurred, from the fire department, Departmental Representative or Canada, resulting from negligently setting off false alarms will be charged to the Contractor in the form of financial progress payment reductions and holdback assessments against the Contract.

1.11 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 1 - GENERAL

- | | |
|-----------------------------|---|
| <u>1.1 SECTION INCLUDES</u> | .1 Procedures to isolate and lockout electrical facility and other equipment from energy sources. |
| <u>1.2 RELATED SECTIONS</u> | .1 Section 01 35 29: Health and Safety. |
| <u>1.3 REFERENCES</u> | .1 CSA C22.1-2020, Canadian Electrical Code, Part 1, Safety Standard for Electrical Installations.
.2 CSA C22.3 No.1-15(R2020), Overhead Systems.
.3 CSA C22.3 No.7-2020, Underground Systems.
.4 COSH: Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code. |
| <u>1.4 DEFINITIONS</u> | .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 has been 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. |
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1.4 DEFINITIONS
(Cont'd)

- .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.
- .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.

1.5 COMPLIANCE
REQUIREMENTS

- .1 Comply with the following in regards to isolation and lockout of electrical facilities and equipment:
 - .1 Canadian Electrical Code.
 - .2 Federal and Provincial Occupational Health and Safety Acts and Regulations.
 - .3 Regulations and code of practise 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.

1.6 SUBMITTALS

- .1 Submit copy of lockout procedures, sample of lockout permit and lockout tags proposed for use in accordance with Section 01 33 00. Submit within 14 calendar days of acceptance of bid.

1.7 ISOLATION OF
EXISTING SERVICES

- .1 Obtain the Departmental Representative's written authorization prior to working on existing live or active electrical facilities and equipment and before proceeding with isolation of such item.
- .2 To obtain authorization, submit to Departmental Representative the following documentation:
 - .1 Written request to isolate the particular service or facility and;
 - .2 Copy of Contractor's Lockout Procedures.

1.7 ISOLATION OF
EXISTING SERVICES
(Cont'd)

- .3 Make a Request for Isolation for each event, unless directed otherwise by Departmental Representative, as follows:
 - .1 Fill-out standard form in current use at the Facility as provided by Departmental Representative or;
 - .2 Where no form exist, make written request indicating:
 - .1 The equipment, system or service to be isolated and it's location;
 - .2 Duration of isolation period (ie: start time & date and completion time & date).
 - .3 Voltage of service feed to system or equipment being isolated.
 - .4 Name of person making the request.
- .4 Do not proceed with isolation until receipt of written notification from Departmental Representative granting the Isolation Request and authorization to proceed with the work.
 - .1 Note that Departmental Representative may designate another person at the Facility being authorized to grant the Isolation Request.
- .5 Conduct safe, orderly shut down of equipment or facility. De-energize, isolate and lockout power and other sources of energy feeding the equipment or facility.
- .6 Determine in advance, as much as possible, in cooperation with the Departmental Representative, the type and frequency of situations which will require isolation of existing services.
- .7 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. Follow Departmental Representative's directives in this regard.
- .8 Conduct hazard assessment as part of the process in accordance with health and safety requirements specified Section 01 35 29.

1.8 LOCKOUTS

- .1 De-energize, isolate and lockout electrical facility, mechanical equipment and machinery from all potential sources of energy prior to working on such items.

1.8 LOCKOUTS
(Cont'd)

- .2 Develop and implement clear and specific lockout procedures to be followed as part of the Work.
- .3 Prepare typed written Lockout Procedures describing safe work practices, procedures, worker responsibilities and sequence of activities to be followed on site by workforce to safely isolate an active piece of equipment or electrical facility and effectively lockout and tagout it's sources of energy.
- .4 Include as part of the Lockout Procedures a system of lockout permits managed by Contractor's Superintendent or other qualified person designated by him/her as being "in-charge" at the site.
 - .1 A lockout permit will be issued to specific worker providing a Guarantee of Isolation before each event when work must be performed on a live equipment or electrical facility.
 - .2 Duties of person managing the permit system to include:
 - .1 Issuance of permits and lockout tags to workers.
 - .2 Determining permit duration.
 - .3 Maintaining record of permits and tags issued.
 - .4 Making a Request for Isolation to Departmental Representative when required as specified above.
 - .5 Designating a Safety Watcher, when one is required based on type of work.
 - .6 Ensuring equipment or facility has been properly isolated.
 - .7 Collecting and safekeeping lockout tags returned by workers as a record of the event.
- .5 Clearly establish, describe and allocate responsibilities of:
 - .1 Workers.
 - .2 Person managing the lockout permit system.
 - .3 Safety Watcher.
 - .4 Subcontractor(s) and General Contractor.
- .6 Generic procedures, if used, must be edited and supplemented with pertinent information to reflect specific project requirements.
 - .1 Incorporate site specific rules and procedures in force at site as provided by Facility Manager through the Departmental Representative.

1.8 LOCKOUTS

(Cont'd)

- .6 (Cont'd)
 - .2 Clearly label the document as being the Lockout procedures applicable to work of this contract.
- .7 Use energy isolation lockout devices specifically designed and appropriate for type of facility or equipment being locked out.
- .8 Use industry standard lockout tags.
- .9 Provide appropriate safety grounding and guards as required.

1.9 CONFORMANCE

- .1 Brief all workers and subcontractors on requirements of this section. Stringently enforce use and compliance.

1.10 DOCUMENTS ON
SITE

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

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 15 work days of notification of Bid Acceptance. Provide three (3) copies.
 - .2 Departmental Representative will review Health and Safety Plan and provide comments.
-

1.3 SUBMITTALS
(Cont'd)

- .2 (Cont'd)
 - .3 Revise the Plan as appropriate and resubmit within five (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 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 and 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 SDS - Safety Data Sheets.

1.4 COMPLIANCE
REQUIREMENTS

- .1 Comply with the Occupational Health and Safety Act for the Province of Newfoundland and Labrador, 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 as well as any other regulations made pursuant to the Act.
 - .1 The Canada Labour Code can be viewed at:
[www.http://laws-lois.justice.gc.ca/eng/acts/L-2/fulltext.html](http://laws-lois.justice.gc.ca/eng/acts/L-2/fulltext.html).

1.4 COMPLIANCE
REQUIREMENTS
(Cont'd)

- .2 (Cont'd)
 - .2 Canadian Occupational Health and Safety Regulations can be viewed at: <http://laws-lois.justice.gc.ca/eng/regulations/SOR-86-304/index.html>.
 - .3 A copy may be obtained at: Canadian Government Publishing Public Works & Government Services Canada Ottawa, Ontario, K1A 0S9 Tel: 819-956-4800 or 1-800-635-7943 Publication No. L31-85/2000 (E or F).
- .3 Treasury Board of Canada Secretariat (TBS):
 - .1 Treasury Board, Fire Protection Standard April 1, 2010 www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=17316§ion=text.
- .4 Canadian Standards Association (CSA):
 - .1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.
- .5 Observe construction safety measures of:
 - .1 NBC 2015, Division B, Part 8.
 - .2 Municipal by-laws and ordinances.
- .6 In case of conflict or discrepancy between above specified requirements, the more stringent shall apply.
- .7 Maintain Workers Compensation Coverage in good standing for duration of Contract. Provide proof of clearance through submission of Letter in Good Standing.
- .8 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 barricades and temporary lighting as required to effectively delineate the Work Site, stop non-authorized entry, and to protect pedestrians and traffic around and adjacent to the Work and create a safe environment. See Section 01 50 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 two (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.
- .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. Provide security guard where adequate protection cannot be achieved by other means.

1.7 PROTECTION

- .1 Give precedence to safety and health of persons and protection of environment over cost and schedule considerations for Work.

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|---|----|--|
| <u>1.7 PROTECTION
(Cont'd)</u> | .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. |
| <u>1.8 FILING OF
NOTICE</u> | .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. |
| <u>1.9 PERMITS</u> | .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. |
| <u>1.10 HAZARD
ASSESSMENTS</u> | .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, including when new trades and subcontractors arrive on site. |
| | .3 | Record results and address in Health and Safety Plan. |
| | .4 | Keep documentation on site for entire duration of the Work. |
| <u>1.11 PROJECT/SITE
CONDITIONS</u> | .1 | Following are potential health, environmental and safety hazards at the site for which Work may involve contact with:
.1 Existing hazardous substances or contaminated building materials: as outlined in Section 01 10 10, Item 1.1 Description of Work. |
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- 1.11 PROJECT/SITE CONDITIONS
(Cont'd)
- .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 to 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.

1.13 HEALTH AND
SAFETY PLAN
(Cont'd)

- .2 (Cont'd)
 - .6 Names, competence and reporting relationship of other supervisory personnel used in the Work for occupational health and safety purposes.
 - .7 Health and safety plan must adhere to the requirements of the Canadian Construction Association (CCA) and Worksafe NB's guidelines for construction during the COVID-19 pandemic.
- .3 On-site Contingency and Emergency Response Plan to 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 PSPC 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.

1.13 HEALTH AND
SAFETY PLAN
(Cont'd)

- .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 and 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.
 - .2 Conduct Formal Inspections on a minimum monthly basis. Use standardized safety inspection forms. Distribute to subcontractors.

1.14 SAFETY
SUPERVISION
(Cont'd)

- .5 (Cont'd)
 - .3 Follow-up and ensure corrective measures are 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.

1.16 MINIMUM SITE
SAFETY RULES

- .1 Notwithstanding requirement to abide by federal and provincial health and safety regulation; 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 by authority having jurisdiction or by the 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 the 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 in excess of \$10,000.00,
 - .4 Interruptions to Facility operations resulting in an operational lost to a Federal department in excess of \$5,000.00.
 - .2 Submit report in writing.
- 1.19 HAZARDOUS PRODUCTS
- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS).
 - .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 publicly accessible locations.
- 1.20 POWDER ACTUATED DEVICES
- .1 Use powder actuated fastening devices only after receipt of written permission from the 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.
- .3 Safety for Inspectors:
 - .1 Provide PPE and training to Departmental Representative and other persons who require entry into confined space to perform inspections.
 - .2 Be responsible for efficacy of equipment and safety of persons during their entry and occupancy in the confined space.

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 Post applicable items, articles, notices and orders 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.

PART 1 - GENERAL

1.1 RELATED
SECTIONS

- .1 Waste Management and Disposal: Section 01 74 22.

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 Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.
- .3 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.

1.3 FIRES

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

1.4 HAZARDOUS
MATERIAL HANDLING

- .1 Store and handle hazardous materials in accordance with applicable federal and provincial laws, regulations, codes and guidelines. Store in location that will prevent spillage into the environment
 - .2 Label containers to WHMIS requirements and keep MSDS data sheets on site for all hazardous materials.
 - .3 Maintain inventory of hazardous materials and hazardous waste stored on site. List items by product name, quantity and date when storage began.
 - .4 Store and handle flammable and combustible materials in accordance with National Fire Code.
-

1.4 HAZARDOUS
MATERIAL HANDLING
(Cont'd)

- .5 Transport hazardous materials in accordance with federal Transportation of Dangerous Goods Regulations and applicable Provincial regulations.

1.5 DISPOSAL OF
WASTES

- .1 Do not bury rubbish and waste materials on site. Dispose in accordance with project waste management requirements specified in Section 01 74 22.
- .2 Do not dispose of hazardous waste or volatile materials, such as mineral spirits, paints, thinners, oil or fuel into waterways, storm or sanitary sewers or waste landfill sites.
- .3 Dispose of hazardous waste in accordance with applicable federal and provincial laws, regulations, codes and guidelines.

PART 1 - GENERAL

- 1.1 GENERAL
- .1 Become familiar with and abide by security rules and regulations;
 - .2 Brief all workers and subcontractors in respect of the security regulations and ensure that they abide by all rules and directives.
 - .3 Any infraction of site security regulations on the part of the Contractor, members of work force or any Subcontractor in his employ, could result in:
 - .1 Financial penalties in the form of progress payment reduction or holdback assessments being levied against the Contractor and;
 - .2 Demand immediate removal of offending party from the site.
- 1.2 BUILDING ACCESS
- .1 Should building access be required, coordination must be made so the employee or employees can be provided an escort or commissionaire.
- 1.3 SITE SECURITY
- .1 When work must be carried out during Off Hours or beyond the work hours previously agreed upon at start of work, provide notice within 48 hours beforehand to minimize impact on Facility's security and tenant operations.
 - .2 Off Hours are defined in section 01 14 10.

PART 1 - GENERAL

1.1 RELATED
SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.

1.2 INSPECTION

- .1 Give timely notice requesting inspection of Work designated for special tests, inspections or approvals by Departmental Representative or by inspection authorities having jurisdiction.
- .2 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.
- .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.
- .4 Pay costs to uncover and make good work disturbed by inspections and tests.

1.3 TESTING

- .1 Tests on materials, equipment and building systems as specified in various sections of the Specifications is the responsibility of the Contractor except where stipulated otherwise.
- .1 Provide all necessary instruments, equipment and qualified personnel to perform tests. Provide testing by manufacturer's certified service technician as outlined in the contract documents.
- .2 At completion of tests, turn over two (2) sets of fully documented tests reports to the Departmental Representative. Submit in accordance with Section 01 33 00.
- .1 Obtain additional copies for inclusion of a complete set in each of the maintenance manuals specified in Section 01 78 00.

1.3 TESTING
(Cont'd)

- .3 Unspecified tests may also be made by Departmental Representative, at the discretion of the Departmental Representative. The costs of these tests will be paid for by the Departmental Representative.
- .4 Where tests or inspections reveal work not in accordance with contract requirements, Contractor shall pay costs for additional tests and inspections incurred by Departmental Representative as required to verify acceptability of corrected work.

1.4 INDEPENDENT
INSPECTION AGENCIES

- .1 Departmental Representative may 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 of electrical equipment.
 - .4 Performance verification tests before building commissioning procedures commences.
 - .5 Tests as specified within various sections designated to be carried out by Contractor under the supervision of Departmental Representative.
 - .6 Additional tests as specified herein.
- .2 Provide sufficient advance notice to Departmental Representative of time when the Work will be ready for testing by designated Testing Agency in order for Departmental Representative to make attendance arrangements with such Agency. When directed by Departmental Representative notify the Agency directly.
- .3 When specified or directed, submit Representative samples of materials, in required quantities, to Testing Agency for testing purposes. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.
- .4 Provide labour and facilities to obtain, handle and deliver samples.

1.4 INDEPENDENT
INSPECTION AGENCIES
(Cont'd)

- .5 Provide sufficient space on site for Testing Agency's exclusive use to store equipment and cure test samples.
- .6 Employment of Independent Inspection and Testing Agencies by Departmental Representative does not relax responsibility to perform Work in accordance with Contract Documents.

1.5 ACCESS TO WORK

- .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 Furnish labour and facility to provide access to the work being inspected and tested.
- .3 Co-operate to facilitate such inspections and tests.

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 new and existing construction and finishes resulting from removal or replacement of defective work.

PART 1 - GENERAL

- 1.1 REFERENCES .1 CSA Z797-18 Code of Practice for Access Scaffold,
- 1.2 SITE ACCESS AND PARKING .1 The Departmental Representative will designate Contractor's access to project site as well as parking facilities for equipment and workers.
- .2 Be advised that while parking facilities for his workers and subcontractors will be on property, such parking facilities may be remote from the actual site of the work. In any case, follow all instructions from the Departmental Representative in regards to parking facilities.
- .3 Parking facilities at site is limited and cannot be used by Contractor. Make arrangements elsewhere for Contractor's vehicles including those of subcontractors and workers.
- 1.3 BUILDING ACCESS .1 Use only access doors, circulation routes, and elevators within building as designated by Departmental Representative to access interior work.
- 1.4 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.
- 1.5 MATERIAL STORAGE .1 Locate site storage trailers where directed by Departmental Representative. Place in location of least interference with existing Facility operations.
- .2 Material storage space on site does not exist. Coordinate delivery to minimize storage period on site before being needed for incorporation into work.
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<u>1.5 MATERIAL STORAGE</u> (Cont'd)	.3	Make arrangements elsewhere in the city as deemed required and pay all costs for storage of materials not ready for incorporation into work.
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<u>1.6 INTERIOR HOARDING</u>	.1	Erect hoarding inside building to isolate construction areas and protect occupants and public for duration of work required and directed by the Departmental Representative.
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<u>1.7 SANITARY FACILITIES</u>	.1	Provide sanitary facilities at the site for the Contractor's workforce.
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<u>1.8 POWER</u>	.1	Arrange, pay for and maintain temporary electrical power supply in accordance with governing regulations and ordinances.
	.2	Supply and install all temporary facilities for power such as pole lines, meter socket, underground cables, etc. as required and to approval of local power supply authority.
	.3	Power supply may be available and will be provided for construction usage at no cost if available. Provide temporary generator if power is not available. DO NOT use generators indoors and only use where and when approved by the Departmental Representative. .1 Make arrangements for the use of such services through the Departmental Representative. .2 Departmental Representative will designate and approve each location of existing power source to which connections can be made to obtain temporary power service. .3 Connect to existing power supply in accordance with CSA C22.1.

1.8 POWER
(Cont'd)

- .4 Provide and pay all costs to supply and install temporary cabling, panelboards, switching devices and other equipment as required to connect into power source, provide adequate ground fault protection and extend power supply from existing source to work areas. Perform work and make all connections in accordance with the CSA C22.1 Canadian Electrical Code, in compliance with the federal and provincial Occupational Health and Safety Regulations as specified in section 01 35 29 and to lockout requirements specified in section 01 35 25.
- .5 Provide and maintain temporary lighting to conduct work. Provide illumination level of not less than 162 lx in all locations.
- .6 Electrical power and lighting systems existing and installed under this Contract can be used for construction requirements provided that guarantees are not affected thereby. Make good any damage caused by the Work.

1.9 SCAFFOLDING

- .1 Design, construct and maintain scaffolding in rigid, secure and safe manner in accordance with CSA Z797.
- .2 Erect scaffolding independent of walls. Remove when no longer required.

1.10 CONSTRUCTION
SIGN AND NOTICES

- .1 Contractor or subcontractor advertisement signboards are not permitted on site.
- .2 Safety and Instruction Signs and Notices:
 - .1 Signs and notices for safety and instruction shall be in both official languages or commonly understood graphic symbols.
- .3 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.

1.11 REMOVAL OF TEMPORARY FACILITIES	.1 Remove temporary facilities from site when directed by Departmental Representative.
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PART 1 - GENERAL

1.1 GENERAL

- .1 Use new material and equipment unless otherwise specified.
- .2 Within seven (7) days of written request by Departmental Representative, submit following information for any materials and products proposed for supply:
 - .1 Name and address of manufacturer.
 - .2 Trade name, model and catalogue number.
 - .3 Performance, descriptive and test data.
 - .4 Compliance to specified standards.
 - .5 Manufacturer's installation or application instructions.
 - .6 Evidence of arrangements to procure.
 - .7 Evidence of manufacturer delivery problems or unforeseen delays.
- .3 Provide material and equipment of specified design and quality, performing to published ratings and for which replacement parts are readily available.
- .4 Use products of a single manufacturer for equipment or material of same type or classification unless otherwise specified.
- .5 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.

1.2 PRODUCT QUALITY

- .1 Contractor is solely responsible for submitting relevant technical data and independent test reports to confirm whether a product or system proposed for use meets contract requirements and specified standards.
 - .2 Final decision as to whether a product or system meets contract requirements rest solely with the Departmental Representative in accordance with the General Conditions of the Contract.
-

1.3 EQUIVALENTS AND
ALTERNATES

- .1 Where any particular brand of manufactured article is described or specified, it is to be regarded as a standard, but another brand equally as good may be accepted, at the discretion of the Departmental Representative. Requests for substitutions must be made one (1) week before the closing of the tenders for consideration by the Departmental Representative. If the Contractor wishes to make a substitution after the Contract has been awarded, make application, complete with all relevant technical literature from the manufacturer to aid the Departmental Representative in the request, in writing, otherwise the Contractor will be held to the terms of the Specifications. No extra cost will be allowed for approved equivalents.
- .2 When the Owner is prepared to permit the use of a brand of manufactured article as an alternative to any specified brand of manufactured article even though such alternative may not be equivalent to that specified, it may be used at the discretion of the Departmental Representative but only after price adjustments have been negotiated and approved by the Departmental Representative.
- .3 If the alternative requires modifications, adjustments or additions to the specified works, submit to the Departmental Representative, drawings and specifications for these modifications, adjustments or additions in the same detail as presented in the Contract. Approval in principle by the Departmental Representative of these modifications, adjustments or additions in no way relieves the Contractor of obligations or liabilities under the Contract to provide for finished piece of work complete and operational in all essentials.
- .4 No change or substitution can be made without the written consent of the Departmental Representative.
- .5 The Departmental Representative will record the time required to evaluate equivalents and alternates proposed by the Contractor including making changes to the Contract Documents occasioned thereby. Whether or not the Departmental Representative accepts a proposed substitute, reimburse the Owner for the charges of the Departmental Representative for evaluating any proposed substitute.

1.4 MANUFACTURERS
INSTRUCTIONS

- .1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods to be used. Do not rely on labels or enclosure provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Departmental Representative in writing of any conflict between these specifications and manufacturers instructions, so that Departmental Representative will designate which document is to be followed.

1.5 AVAILABILITY

- .1 Immediately notify Departmental Representative in writing of unforeseen or unanticipated material delivery problems by manufacturer. Provide support documentation as per clause 1.1.2 above.

1.6 WORKMANSHIP

- .1 Ensure quality of work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed.
- .2 Remove unsuitable or incompetent workers from site as stipulated in the General Conditions of the Contract.
- .3 Maintain cooperation of workers in laying out work. Maintain efficient and continuous supervision on site at all times.
- .4 Coordinate work between trades and subcontractors. See section 01 14 10 for additional information.
- .5 Coordinate placement of openings, sleeves and accessories.

1.7 FASTENINGS -
GENERAL

- .1 Provide metal fastenings and accessories in same texture, colour and finish as base metal in which they occur. Prevent electrolytic action between dissimilar metals. Use non-corrosive fasteners, anchors and spacers for securing exterior work and in humid areas.

1.7 FASTENINGS -
GENERAL
(Cont'd)

- .2 Space anchors within limits of load bearing or shear capacity and ensure that they provide positive permanent anchorage. Wood or organic material plugs not acceptable.
- .3 Keep exposed fastenings to minimum, space evenly and lay out neatly.
- .4 Fastenings which cause spalling or cracking of material to which anchorage is made, are not acceptable.
- .5 Do not use explosive actuated fastening devices unless approved by Departmental Representative. See section on Health and Safety Requirements in this regard.

1.8 FASTENINGS -
EQUIPMENT

- .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
- .2 Use heavy hexagon heads, semi-finished unless otherwise specified.
- .3 Bolts may not project more than one diameter beyond nuts.
- .4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur and, use resilient washers with stainless steel.

1.9 STORAGE,
HANDLING AND
PROTECTION

- .1 Deliver, handle and store materials in manner to prevent deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled materials in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work. Provide additional cover where manufacturer's packaging is insufficient to provide adequate protection.
- .3 Store products subject to damage from weather in weatherproof enclosures.

1.9 STORAGE,
HANDLING AND
PROTECTION

(Cont'd)

- .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.
- .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 Immediately remove damaged or rejected materials from site.
- .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.

PART 1 - GENERAL

- 1.1 GENERAL
- .1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
 - .2 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
 - .3 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

- 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 work areas in a tidy condition, free from accumulations of waste material and debris. Clean areas on a daily basis.
 - .2 Conduct thorough cleaning of these areas at end of each workshift when used by workers or affected by the Work.
 - .3 Provide on-site bulk containers for collection of waste materials and debris.
 - .4 Use separate collection bins, clearly marked as to purpose, for source separation and recycling of waste and debris in accordance with waste management requirements specified.
 - .5 Remove waste materials, and debris from site on a minimum weekly basis.
 - .6 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.
 - .7 Immediately clean all dust, dirt, smears, scuffs and soiled surfaces in lobbies, corridors, stairwells and within tenant occupied areas resulting from the Work.

- 1.3 CLEANING DURING CONSTRUCTION
(Cont'd)
- .7 (Cont'd)
- .1 Perform cleaning, dusting and washing operations, carpet vacuuming (including shampooing if deemed required by Departmental Representative) and floor washing as necessary to thoroughly clean all soiled surfaces.
- .8 Remove snow and ice from site as necessary to complete the Work.

- 1.4 FINAL CLEANING
- .1 In preparation for acceptance of the completed work perform final cleaning.
- .2 Remove debris and surplus materials from crawl areas, roof areas and other accessible concealed spaces.
- .3 Clean equipment, to a sanitary condition. Replace filters of mechanical equipment.
- .4 Vacuum out all panelboards, disconnects, distribution boards, transformers and other equipment installed under this contract.

PART 1 - GENERAL

1.1 WASTE
MANAGEMENT

- .1 Incorporate environmental and sustainable practices in managing waste resulting from work.
- .2 Divert as much waste as possible from landfill.
- .3 Coordinate work of subtrades and subcontractors to ensure all possible waste reduction and recycling opportunities are taken. Follow waste management requirements specified in trade sections of the Specifications.
- .4 Reduce waste during installation of new materials. Undertake practices which will optimize full use of materials and minimize waste.
- .5 Develop innovative procedures to reduce quantity of waste generated by construction such as by delivering materials to site with minimal packaging etc.
- .6 Provide on-site facilities to collect, handle and store anticipated quantities of reusable, salvageable and recyclable materials.
- .7 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.
 - .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.
- .8 Isolate product packaging and delivery containers from general waste stream. Send to recycling facility or return to supplier/manufacturer.
- .9 Send leftover material resulting from installation work for recycling whenever possible.

1.1 WASTE
MANAGEMENT
(Cont'd)

- .10 Establish methods whereby hazardous and toxic materials, and their containers used on site are properly handled, stored and disposed in accordance with applicable federal, provincial and municipal laws and regulations.

1.2 DISPOSAL
REQUIREMENTS

- .1 Burying or burning of rubbish and waste materials is prohibited.
- .2 Disposal of volatile materials, mineral spirits, oil, paint, and other hazardous materials into waterways, storm, or sanitary sewers is prohibited.
- .3 Dispose of waste only at approved waste processing facility or landfill sites approved by authority having jurisdiction.
- .4 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.
- .5 Transport and dispose of waste intended for waste processing plant or landfill facility in separated condition and to Operator's rules and recommendations in support of their effort to recycle, reduce and divert certain waste stream from general landfill.
- .6 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.
- .7 Sale of salvaged items by Contractor to other parties not permitted on site.

PART 1 - GENERAL

1.1 SECTIONS
INCLUDES

- .1 Administrative procedures preceding inspection and acceptance of Work by Departmental Representative.

1.2 RELATED
SECTIONS

- .1 Section 01 78 00 - Closeout Submittals.

1.3 INSPECTION AND
DECLARATION

- .1 Contractor's Inspection: coordinate and perform, in concert with subcontractors, an inspection and check of all Work. Identify and correct deficiencies, defects, repairs and perform outstanding items as required to complete work in conformance with Contract Documents.
 - .1 Notify Departmental Representative in writing when deficiencies from Contractor's inspection have been rectified and that Work is deemed to be complete and ready for Departmental Representative's inspection of the completed work.
- .2 Departmental Representative's Inspection: Accompany Departmental Representative during all substantial and final inspections of the Work.
 - .1 Address defects, faults and outstanding items of work identified by such inspections.
 - .2 Advise Departmental Representative when all deficiencies identified have been rectified.
- .3 Note that Departmental Representative will not issue a Certificate of Substantial Performance of the work until such time that Contractor performs following work and turns over the specified documents:
 - .1 Project record as-built documents;
 - .2 Final Operations and Maintenance manuals;
 - .3 Maintenance materials, parts and tools;
 - .4 Compliance certificates from applicable authorities;
 - .5 Reports resulting from designated tests;
 - .6 Demonstration and training complete with user manuals;
 - .7 Manufacturer's Guarantee certificates.
 - .8 Testing, adjusting and balancing of equipment and systems complete with submission of test reports.

- 1.3 INSPECTION AND .3 (Cont'd)
DECLARATION
(Cont'd) .9 Commissioning of equipment and systems
specified.
- .4 Correct all discrepancies before Departmental
Representative will issue the Certificate of
Completion.

PART 1 - GENERAL

1.1 SECTION
INCLUDES

- .1 Project Record Documents.
- .2 Operations and Maintenance Data.
- .3 Preventative Maintenance Plan.

1.2 PROJECT RECORD
DOCUMENTS

- .1 Departmental Representative will provide two (2) white print sets of contract drawings 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 upon request.
- .4 As-Built Drawings:
 - .1 Record changes in red ink on the prints. Mark only on one set of prints and at completion of work, neatly transfer notations to second set (also by use of red ink).
 - .2 Submit both sets to Departmental Representative prior to application for Certificate of Substantial Performance.
 - .3 Stamp all drawings with "As-Built". Label and place Contractor's signature and date.
 - .4 Show all modifications, substitutions and deviations from what is shown on the contract drawings.
 - .5 Record following information:
 - .1 Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure;
 - .2 Location of all capped or terminated services and utilities.
 - .3 Chases for mechanical, electrical and other services;

1.2 PROJECT RECORD
DOCUMENTS
(Cont'd)

.4 (Cont'd)

.5 (Cont'd)

.4 Any details produced in the course of the contract by the Departmental Representative to supplement or to change existing design drawings;

.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 Maintain As-Built documents current as the contract progresses. Departmental Representative will conduct reviews and inspections of the documents on a regular basis. 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.

.6 Submit on paper and in electronic format as pdf files. Forward pdf and in the native program format, files on USB compatible with PSPC encryption requirements or through email or alternate electronic file sharing service such as ftp, as directed by Departmental Representative.

1.3 REVIEWED SHOP
DRAWINGS

.1 Provide a complete set of all shop drawings reviewed for project to incorporate into each copy of the Operations and Maintenance Manuals.

.2 Submit full sets at same time and as part of the contents of the Operation and Maintenance Manuals specified.

1.4 OPERATIONS &
MAINTENANCE MANUAL

.1 O&M Manual - Definition: an organized compilation of operating and maintenance data including detailed technical information, documents and records describing operation and maintenance of individual products or systems as specified in individual sections of the specifications.

.2 Manual Language: final manuals to be in both English and French languages.

1.4 OPERATIONS &
MAINTENANCE MANUAL
(Cont'd)

- .3 Number of copies required:
 - .1 Upon review and acceptance by Departmental Representative, submit four (4) final copies. Interim copies are not to be considered as part of the final copies unless they have been fully revised and are identical to the final approved version.
- .4 Submission Date: submit complete operation and maintenance manual to Departmental Representative three (3) weeks prior to application for Certificate of Substantial Performance of the work.
- .5 Binding:
 - .1 Assemble, coordinate, bind and index required data into Operation and Maintenance Manual.
 - .2 Use vinyl, hard covered, 3 "D" ring binders, loose leaf, sized for 215 x 280 mm paper, with spine pocket.
 - .3 Where multiple binders are needed, correlate data into related consistent groupings.
 - .4 Identify contents of each binder on spine.
 - .5 Organize and divide data following same numerical system as the section numbers of the Specification Manual.
 - .6 Dividers: separate each section by use of cardboard dividers and labels. Provide tabbed fly leaf for each individual product and system and give description of product or component.
 - .7 Type lists and notes. Do not hand write.
 - .8 Drawings, diagrams and manufacturers literature must be legible. Provide with reinforced, punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- .6 Manual Contents:
 - .1 Cover sheet containing:
 - .1 Date submitted.
 - .2 Project title, location and project number.
 - .3 Names and addresses of Contractor, and all Sub-Contractors.
 - .2 Table of Contents: provide full table of contents in each binder(s), clearly indicate which contents are in each binder.
 - .3 List of maintenance materials.
 - .4 List of spare parts.
 - .5 List of special tools.
 - .6 Original or certified copy of warranties and product guarantees.

1.4 OPERATIONS &
MAINTENANCE MANUAL
(Cont'd)

- .6 (Cont'd)
 - .7 Copy of approval documents and certificates issued by Inspection Authorities.
 - .8 Copy of reports and test results performed by Contractor as specified.
 - .9 Product Information (PI Data) on materials, equipment and systems as specified in various sections of the specifications. Data to include:
 - .1 List of equipment including manufacturer's name, supplier, local source of supplies and service depot(s). Provide full addresses and telephone numbers.
 - .2 Nameplate information including equipment number, make, size, capacity, model number and serial number.
 - .3 Parts list.
 - .4 Installation details.
 - .5 Operating instructions.
 - .6 Maintenance instructions for equipment.
 - .7 Maintenance instructions for finishes.
- .7 Shop drawings:
 - .1 Include complete set of reviewed shop drawings into each copy of the operations and maintenance manual.
 - .2 Fold and bind material professionally in a manner that corresponds with the specification section numbering system.
 - .3 When large quantity of data is submitted, place into separate binders of same size as O&M binders.
- .8 Equipment and Systems Data: the following list indicates the type of data and extent of information required to be included for each item of equipment and for each system:
 - .1 Description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
 - .2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.
 - .3 Include installed colour coded wiring diagrams.

1.4 OPERATIONS &
MAINTENANCE MANUAL
(Cont'd)

- .8 (Cont'd)
- .4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- .5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- .6 Manufacturer's printed operation and maintenance instructions.
- .7 Sequence of operation by controls manufacturer.
- .8 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- .9 Provide installed control diagrams by controls manufacturer.
- .10 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.
- .11 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .12 Include test reports.
- .13 Additional requirements as specified in individual specification sections.

1.5 PREVENTATIVE
MAINTENANCE PLAN

- .1 Provide a preventative maintenance program for AAFC. This constitutes a written document detailing all recommended maintenance on overhead components and a maintenance schedule. Some items to include (not necessarily limited to): tree trimming, thermal scans, operation of fuse cut-outs, visual inspections, special maintenance following major weather event.

1.6 SPARE PARTS,
TOOLS AND
MAINTENANCE
MATERIALS

- .1 Provide spare parts, special tools and extra materials for maintenance purposes in quantities specified in individual specification sections.
- .2 Tag all items with associated function or equipment.
- .3 Provide items of same manufacture and quality as items in Work.

1.6 SPARE PARTS,
TOOLS AND
MAINTENANCE
MATERIALS
(Cont'd)

- .4 Deliver to site in well packaged condition. Store in location as directed by Departmental Representative.
- .5 Clearly mark as to contents indicating:
 - .1 Part number.
 - .2 Identification of equipment or system for which parts are applicable.
 - .3 Installation instructions or intended use as applicable.
 - .4 Name, address and telephone number of nearest supplier.
- .6 Prepare and submit complete inventory list of items supplied. Include list within Maintenance

PART 1 - GENERAL

1.1 RELATED SECTIONS .1 Operations and Maintenance Manual: Section 01 78 00.

1.2 DESCRIPTION .1 Demonstrate scheduled operation and maintenance of equipment and systems to the facility's personnel prior to date of final inspection.

.2 Departmental Representative will provide a list of facility's personnel to receive instructions,

.3 Cooperate with Departmental Representative in coordinating time and attendance of facility's personnel with manufacturer's training Representative(s).

1.3 QUALITY CONTROL .1 Ensure that only personnel from own forces, Subcontractors or Suppliers competent and fully knowledgeable in the particular material component, equipment or system installation are used to provide training and demonstrations.

.2 When specified in individual Sections, obtain the manufacturers authorized Representative to demonstrate operation of equipment and systems, instruct facility's personnel, and provide written report that demonstration and instructions have been completed.

.3 Upon request, provide evidence to Departmental Representative of individual trainer's knowledge and qualifications.

1.4 SUBMITTALS .1 Submit schedule of time, date and complete list of equipment and systems for which demonstration and training sessions will be provided. Submit schedule a minimum of two (2) weeks prior to designated dates, for Departmental Representative's approval.

- END OF SECTION

PART 1 - GENERAL

1.1 SECTION
INCLUDES

- .1 This section deals with commissioning activities to occur during the construction stage and the early period of facility occupancy stage.
- .2 Section includes:
 - .1 Commissioning activities to be performed by the Contractor who is assigned membership on a Commissioning Team as part of the contract requirements.
 - .2 Commissioning activities to be performed by other members of the Commissioning Team.
- .3 In general, Contractor's commissioning activities consists of performing specified tasks and functions to assist the Commissioning Agent, along with other members of the commissioning team who will commission various components and systems of the Facility.

1.2 RELATED
SECTIONS

- .1 Operations and Maintenance Manuals: Section 01 78 00.
- .2 Demonstration and Training: Section 01 79 00.

1.3 BACKGROUND
INFORMATION

- .1 Historically in the past, the term commissioning has been used in reference to the process used to conduct testing, adjusting and balancing of the heating, ventilation and air conditioning (HVAC) systems of a building.
 - .2 Commissioning (or the commissioning process), as understood by PSPC, is a planned program of activities conducted in concert with other activities performed during each stage of project delivery.
-

1.3 BACKGROUND
INFORMATION
(Cont'd)

- .2 (Cont'd)
- .1 The commissioning process identifies issues during the Planning and Design stages which are addressed during the Construction and Occupancy Stages of a Facility to ensure that the built facility is constructed and proven to operate satisfactorily under all weather, environmental and occupancy conditions to meet operational and user requirements.
- .2 Commissioning activities during the Construction stage incorporates a third party verification process and a transfer of critical operational knowledge to Facility personnel.

1.4 COMMISSIONING
OBJECTIVE

- .1 A Commissioning Plan has been prepared by the Design Consultant, on behalf of PSPC, which identifies, among other issues, specific commissioning activities to be carried out by the commissioning team during the Construction of the project.
- .2 The commissioning activities have the following objectives:
- .1 Collect data on equipment and systems being supplied and document their installation;
- .2 Conduct checks and tests on fully installed building components, equipment, systems and integrated systems to:
- .1 Verify whether they operate in accordance with requirements of Contract Documents;
- .2 Verify performance against design criteria and user requirements and measure peak capacities;
- .3 Prepare a Building Management Manual (BMM) which contains operations and maintenance data, as-built record documents, commissioning reports, training data and other critical information for future use by Facility operational staff;
- .4 Ensure transfer of knowledge on the operations, maintenance and management of the Facility to Tenant and Operational personnel by means of appropriate training.
- .3 Work to achieve the above objectives requires a collaborative effort from all members of the commissioning team.
- .1 Contractor's commissioning activities and responsibilities are described in Clause 1.8 below.

1.4 COMMISSIONING
OBJECTIVE
(Cont'd)

- .4 Commissioning activities performed by the Commissioning Agent and the Design Consultant does not replace checks, tests, adjustments, balancing and other performance verification procedures to be carried out by the Contractor as an integral part of performing the Work of this contract as specified in other sections of the Specifications.

1.5 DEFINITIONS

- .1 For the purpose of this contract, the various terms listed below, as they relate directly or indirectly to the commissioning process, shall be deemed to have the following meaning.
- .2 Commissioning Process: a planned program of tasks, activities and procedures carried out systematically during the Construction and Occupancy Stages in accordance with the commissioning objectives, specified in clause 1.4.2 above, to:
- .1 Verify whether the fully installed equipment, systems and integrated systems operate in accordance with contract documents and design criteria and;
- .2 Confirm appropriate documentation is compiled to effectively train O& M staff and prepare a comprehensive Building Management Manual (BMM).
- .3 Commission (ie: to commission a building component or system): tests and checks conducted by Commissioning Agent on all systems and integrated systems of the Facility; carried out only after they are fully installed, functional and Contractor's Performance Verification responsibilities have been completed and approved.
- .1 Contractor provides assistance during this process by operating equipment and systems, by troubleshooting and making adjustments as may be required.
- .2 Systems are run under their full operation and under various modes to determine if they function correctly, consistently, at peak efficiency and interactively with each other as intended in accordance with Contract Documents and design criteria.
- .3 During these checks, adjustments may be made enhancing performance to meet environmental or user requirements.

1.5 DEFINITIONS
(Cont'd)

- .4 Commissioning Agent: a specifically appointed person, representing the Departmental Representative, responsible for the development of a Commissioning Plan and managing it's implementation by overseeing and coordinating various activities and responsibilities to be performed by members of the Commissioning Team.
 - .1 In this project, the Commissioning Agent is part of the engineering consultant firm engaged by PSPC to prepare the final design and contract documents for this Work.
 - .2 Commissioning Agent plays a lead role in support to the Departmental Representative to ensure that the commissioning objectives are achieved.
- .5 Commissioning Manager: a PSPC departmental employee providing advice and guidance on commissioning requirements to the Commissioning Agent in support to the Departmental Representative.
- .6 Commissioning Plan: the document which describes the organization, scheduling, allocation of resources, required documentation, target dates, and team roles and responsibilities for verification that the built works meet Contract Document and design criteria requirements.
- .7 Contractor: means the General Contractor, however it also refers to any personnel from subcontractors, including the controls and TAB specialists, suppliers and manufacturer's technical persons which Contractor employs to carry out his/her designated commissioning duties and activities. Commissioning of supplied systems is to be provided by manufacturer's certified service staff or approved alternate.
- .8 Design Consultant: persons from the civil, architectural, mechanical and electrical design disciplines of the engineering firm(s) which have been engaged by the Departmental Representative to prepare the final design and produce the contract documents. Design Consultant also has specifically identified commissioning activities for this project.

1.5 DEFINITIONS
(Cont'd)

- .9 Design Criteria: All those factors included in the design of a Facility prescribed by the tenant needs or as determined by Designer as necessary in order to meet all Facility functional and user operational requirements
- .10 Installation/Start-up Checks: (sometimes referred to as pre-functional checks) A written compilation of checks and inspections to be performed by Contractor during the pre-start-up and start-up of a particular equipment or system component.
 - .1 Checklist sheets are produced which include the following data:
 - .1 Product manufacturer's installation instructions and recommended checks and;
 - .2 Special procedures as specified in relevant sections of Specifications;
 - .3 Other items considered good installation and engineering industry practices deemed appropriate for proper and efficient operation.
 - .2 Standard Installation/Start-Up Checklist sheets prepared by equipment manufacturer are acceptable for use. However, supplement with additional data representative of specific project conditions as deemed required by Commissioning Agent.
 - .3 Use Checklist sheets for all equipment installation. Document in writing on checklist the various checks made, deficiencies noted and corrective action taken.
 - .4 Installer to sign Checklist sheets upon completion, certifying that stated checks and inspections have been performed.
 - .5 Use of Installation/Start-Up Checklists shall not be considered part of the commissioning process but shall be stringently used for all equipment pre-start and start-up procedures.
 - .6 Return completed Installation/Start-Up Checklist sheets after use to Commissioning Agent for retention. Checklists are required by Commissioning Agent when Facility is commissioned and will be included in the BMM manual at completion of project.

1.5 DEFINITIONS
(Cont'd)

- .11 Performance Verification: (sometimes referred to Functional Testing) checks, running dynamic tests and adjustments carried out by Contractor on equipment and systems, upon their installation, to ensure they operate correctly, efficiently and function independently and interactively with other systems as intended in accordance with contract documents and manufacturer's recommendations.
 - .1 Performance Verification shall not be considered part of the commissioning process. It is however considered an essential and integral part of Contractor's responsibilities in the equipment installation process which must be stringently conducted, successfully completed and approved by Departmental Representative before a piece of equipment or system is considered fully installed and functional.
 - .2 Facility components and systems will not be commissioned by Commissioning Agent until performance verification has been completed and approved.
- .12 Performance Verification Report Sheets (PV sheets): forms developed by Commissioning Agent for Contractor's use to record measured data and readings taken during functional testing and Performance Verification procedures.
- .13 Product Information (PI Data): a compilation of data gathered on a particular piece of equipment, typically produced by manufacturer, which includes nameplate information, installation/startup instructions, parts list, operating instructions, maintenance guidelines and other pertinent technical data and recommended checks that is necessary to prepare for start-up and functional testing and used during operation and maintenance of such equipment. This documentation is included in the Building Management Manual (BMM) at completion of work.

1.6 COMMISSIONING
TEAM

- .1 A commissioning team will be assembled to carryout various functions needed to effectively commission the Facility. Contractor will be a part of this team with duties and responsibilities as specified in this section and in other sections of the Specifications.
- .2 Members of the Commissioning Team are as follows:

(Cont 'd)

- .3 Effective commissioning requires coordination between members of the commissioning team. Cooperate with other team members in fulfilling assigned duties and as follows:
 - .1 Communicate commissioning objectives, to subcontractors, suppliers and manufacturers.
 - .2 Coordinate activities between subcontractors and trades as needed to carryout Contractor's assigned commissioning activities.
 - .3 Ensure attendance of subcontractors and required specialist at commissioning meetings and during the commissioning process.

- .1 Organize and arrange for the services of subcontractors, their specialists and manufacturer's technical representatives to perform Contractor's commissioning activities.
- .2 Verify personnel forming part of the Commissioning Team are qualified and knowledgeable of installed equipment and systems and with design intent.
- .3 Develop in conjunction with the Commissioning Agent a commissioning schedule as specified.
- .4 Notify Departmental Representative in writing when Facility is ready for be commissioned. Give 21 calendar day notice.
- .5 Commissioning will only commence once that full documentation has been received and installed equipment and systems have undergone successful performance verification.
- .6 Note that Certificate of Substantial Performance will only be issued when:
 - .1 All commissioning documentation has been received and found suitable by Departmental Representative;

1.7 CONTRACTOR'S
COMMISSIONING
ACTIVITIES
(Cont'd)

- .1 (Cont'd)
- .6 (Cont'd)
 - .2 Designated equipment and systems have been commissioned and;
 - .3 Training has been completed.
- .7 Performance faults:
 - .1 Equipment and systems found not operating correctly or not performing as intended during commissioning shall be re-verified by checking 100% of all equipment and components of the unfunctional system, including related controls as required to rectify the deficiencies and ensure correct performance.
 - .2 Costs to conduct additional tests and inspections, as deemed required by Departmental Representative, to determine acceptability and proper performance of such item to be paid for by Contractor.
- .2 Prior to Facility being Commissioned:
 - .1 Submit commissioning documentation as specified below.
 - .2 Submit the Installation/Start-Up Checklist sheets to Commissioning Agent for review prior to conducting the pre-start and start-up of any piece of equipment. Incorporate additional start-up instructions onto checklist as determined by the Commissioning Agent's review.
 - .3 Conduct the pre-start and start-up of all equipment by following and filling out the approved Installation/Start-Up Checklists.
 - .4 Conduct Performance Verification on all installed equipment and systems. Use and fill out the PV Report Sheets provided.
 - .5 Upon completion of start-up and performance verification process, submit signed copy of Checklist and PV sheets to Commissioning Agent as affidavit that required checks and tests were successfully conducted.
 - .6 Record performance measurements and data reading on PV sheets and return to Commissioning Agent for compilation.
 - .7 Give Departmental Representative and Commissioning Agent a minimum of five (5) days notice for start-up and performance verification of equipment and systems which must be witnessed by Commissioning Agent as determined by Commissioning Agent beforehand on PV sheets.

1.7 CONTRACTOR'S
COMMISSIONING
ACTIVITIES
(Cont'd)

- .2 (Cont'd)
 - .8 Provide missing information and data as identified by Commissioning Agent and Departmental Representative during documentation review.
 - .9 Submit above noted documentation before Commissioning will proceed.
 - .10 Address deficiencies in Work identified during performance verification of equipment and systems. Conduct additional performance verification thereafter.
 - .11 Arrange for special tools and devices, identified at commissioning meeting(s), as deemed required to assist with commissioning.
 - .12 Provide access ladders, two way radios and other equipment required by Team when facility will be commissioned.
- .3 When Facility is being Commissioned:
 - .1 Provide qualified tradespersons to be present at site to assist Commissioning Agent for the time period and commissioning activity specified.
 - .2 Assist in commissioning electrical systems specified and as follows:
 - .1 Operate designated building component, mechanical/electrical equipment and system under all modes of operation and conduct checks and tests as directed by Commissioning Agent.
 - .2 Check and verify that building component, equipment, systems and integrated systems, including their controls, are functioning and responding correctly and interactively with each other.
 - .3 Test systems independently and then in unison with other related systems.
 - .4 Conduct all Commissioning checks and tests in presence of and witnessed by Commissioning Agent and Departmental Representative.
 - .5 Assist Design Consultant and other members of the commissioning team who will also be present to commission Facility.
 - .3 Specific procedures used to commission Facility will be provided by Commissioning Agent which includes:
 - .1 Sequential order of building component and system to be tested.
 - .2 Running systems under various anticipated modes and demands (example: high and low cooling or heating loads, duplicating outside temperature conditions, fire alarm and power failure conditions etc.).

1.7 CONTRACTOR'S
COMMISSIONING
ACTIVITIES
(Cont'd)

- .3 (Cont'd)
 - .3 (Cont'd)
 - .3 Running building controls through all sequences of operation to verify and confirm that equipment and systems are responding as designed and intended.
 - .4 Operating designated equipment at peak capacities, recording output data against design criteria.
 - .4 Run component or systems as long as necessary to effectively commission all items as deemed required by Commissioning Agent and Departmental Representative.
 - .5 Monitor equipment and system responses.
 - .6 Record test results, measurements and other data on commissioning forms provided by Commissioning Agent.
 - .7 Assist in analyzing results. Identify system deficiencies and components not responding as intended.
 - .8 Correct deficiencies and system non-conformance issues. Adjust, calibrate or fine tune system components as required. Debug system software as may be required.
 - .9 Retest systems when directed to confirm compliance.
 - .4 Upon completion of Facility Commissioning:
 - .1 Provide training to maintenance & operational personnel as specified below.
 - .2 Turn over any filled-in checks sheets or reports resulting from commissioning.
 - .5 During Warranty period at Occupancy Stage:
 - .1 After ten (10) months has elapsed from the commencement of the warranty period, conduct commissioning checks on the systems and equipment supplied under this Contract.
 - .2 Fine tune components, systems and integrated systems and continue system debugging to optimize Facility performance.
 - .3 Rectify warranty issues.
 - .4 Submit written report to Commissioning Agent and Departmental Representative.
 - .1 Indicate results noted and corrective action taken.
 - .2 Note improvements made to operating parameters and control settings.

1.7 CONTRACTOR'S COMMISSIONING ACTIVITIES (Cont'd)

.5 (Cont'd)

.4 (Cont'd)

.3 Recommend modifications deemed advisable to improve performance, environmental conditions, energy consumptions and other issues.

.5 Commissioning Agent and other team members as determined by Departmental Representative to be present during such work.

1.8 COMMISSIONING ACTIVITIES OF OTHER TEAM MEMBERS

.1 Commissioning Agent:

.1 Represents the Departmental Representative during the commissioning process.

.2 Coordinates activities of the commissioning team members to ensure that commissioning activities are carried out properly and in a timely manner.

.3 Prepares commissioning schedule in concert with Contractor.

.4 Chairs commissioning meetings.

.5 Works with Contractor, subcontractors, equipment suppliers, Design Consultant resources, PSPC and Tenant Representatives to resolve technical problems which may arise during the process.

.6 Witnesses Contractor's pre-start, start-up and performance verification procedures for certain equipment and systems specified when deemed required due to their critical nature and function in the Facility.

.7 Verifies that Installation/Start-up Checklists and Performance Verification checks and tests are used and stringently followed by Contractor.

.8 Assists Contractor in coordination of training activities for facility staff.

.9 Submits final commissioning report to Departmental Representative.

.2 Design Consultant:

.1 Prepares in concert with Commissioning Agent the Commissioning Plan.

.2 Reviews Contractor's Installation/Start-up Checklists for completeness, incorporating supplement data not addressed on checklist. Provides to Contractor checklist for products which manufacturer does not provide installation and start-up instructions.

.3 Develops performance verifications report sheets for use by Contractor to record actual data and measurements against design data criteria.

1.8 COMMISSIONING .2
ACTIVITIES OF OTHER
TEAM MEMBERS
(Cont'd)

(Cont'd)

.4 Includes, on performance verification report sheets, design data and anticipated performance values for equipment and systems to undergo verification.

.5 Compiles commissioning documentation submitted by Contractor. Prepares final Building Management Manuals.

.6 Assists Commissioning Agent in witnessing pre-start, start-up and performance verification activities.

.7 Approves type and method of calibration for instruments used by Contractor to conduct performance verification and commissioning tests.

.8 Assists Commissioning Agent in reviewing and analyzing tests results.

.9 Participate in the training sessions provided by Contractor to tenant O&M staff by giving introductory information on design philosophy, design intent and systems designs,

.10 Assist in the resolution of issues relating to commissioning.

.3 Tenant Representative:

.1 Participates with other team members to ensure that systems as installed meet the operational and functional requirements.

.2 Periodically attends commissioning meetings as required.

.3 Attends final commissioning activities.

.4 Assists in resolving technical problems by providing additional details on operational requirements.

.4 Facility Operations and Maintenance Staff:

.1 Participates in the commissioning process to obtain early introduction to the facility systems and to provide early operator feedback.

.2 Prime interest is in the familiarization and training of appropriate maintenance staff.

.3 Staff may attend certain critical equipment start-up and performance verification activities and provide comments and practical suggestions on issues which may arise during actual operation, maintenance and repair of the equipment and systems.

.4 Attends commissioning meetings periodically, depending on issues being discussed.

.5 Identifies the appropriate staff which must receive the O&M training.

1.9 COMMISSIONING MEETINGS

- .1 General briefing on commissioning will be conducted at first project construction meeting at commencement of work.
 - .1 Issues discussed will include scope and extent of commissioning and clarify responsibilities of commissioning team members.
 - .2 All team members must attend, including subcontractors of equipment and systems to be commissioned.
- .2 Include commissioning as one agenda item at each construction meeting held and chaired by Contractor during construction. Give subject due consideration for each material and equipment supplied and for all matters of Work.
- .3 At the 60% construction completion stage, as determined by Departmental Representative, a separate commissioning scope meeting will be called by Departmental Representative to review progress of work, discuss schedule of equipment start-up activities and prepare for upcoming commissioning. Issues at meeting will include:
 - .1 Review duties and responsibilities of Contractor and subcontractors, addressing delays and potential problems.
 - .2 Determine the degree of involvement of each trade and manufacturer's representatives in the commissioning process.
- .4 Separate commissioning meetings will be held from the 60% construction stage to project completion. Meetings are tentatively scheduled to be held on a bi-monthly basis but may be more frequent during the equipment start-up and functional testing period.
- .5 Whenever possible meetings will be held immediately following the construction meetings.
- .6 Meeting will be chaired by Departmental Representative, who will record and distribute minutes.
- .7 Ensure that all subcontractors and relevant manufacturer representatives are present at the 60% commissioning scope meeting and at other meetings as deemed required.

1.10 COMMISSIONING
SCHEDULE

- .1 Address commissioning activities within the construction work schedule. Clearly identify allocated time period for commissioning and training activities.
- .2 Provide a separate independent commissioning schedule at the 60% construction stage in order that specific issues and individual details of commissioning can be reviewed, discussed and dealt with from that period onward to project completion. Submit monthly updates thereafter,
- .3 Develop commissioning schedule in conjunction with Commissioning Agent. Indicate allocated time period and anticipated dates for:
 - .1 Submission of commissioning documentation, including O&M Manuals.
 - .2 Equipment and system start-up and performance verification, making them ready to be commissioned.
 - .3 Allocated period to commission designated building components and systems.
 - .4 Training period.
 - .5 Work during Warranty period.
- .4 Submit schedule to Departmental Representative for review.

1.11 TRAINING

- .1 Commence process of familiarizing Tenant and O&M personnel in the early stages of work on purpose and operation of various equipment and systems. Continue process throughout the entire construction duration.
 - .1 Provide informal briefings during occasional site visits, at planned commissioning meetings and during the final commissioning site activities.
- .2 Conduct formal demonstration and training sessions only after all identified systems have been commissioned by Commissioning Agent and Departmental Representative has given approval to proceed with the training process.
- .3 Provide training and demonstration on equipment, sub-systems, systems and integrated systems.
- .4 Carryout training in accordance with requirements of Section 01 79 00.

1.11 TRAINING
(Cont'd)

- .5 Submit written agenda of training session(s) four (4) weeks beforehand for review by Commissioning Agent and Departmental Representative.
- .6 Coordinate content with Commissioning Agent. Design Consultant will provide introductory presentation giving general outline of each system design and intended function.
- .7 Submit training manuals for review two (2) weeks prior to actual training.
- .8 Ensure required tools and O&M Manuals are on site for training and system demonstration.
- .9 As a minimum, the training sessions to cover the following information:
 - .1 Introduction.
 - .2 Description of the system with factory personnel being involved at appropriate times.
 - .3 Instructions on start-up procedures including seasonal procedures, system check-lists and emergency procedures.
 - .4 Operational procedures, including occupancy considerations, seasonal change-over, manual and automatic operations and emergency modes.
 - .5 Instruction on system shutdowns, including checklists.
 - .6 Instructions on all aspects of system maintenance, including routine servicing, lubrication, overhaul and factory servicing.
 - .7 Information concerning the scope of warranties and their use.
 - .8 A description of spare parts in stock and their service.
 - .9 A description of normal tools required for servicing the systems/equipment.
- .10 Submit typewritten record of training sessions given and list of attendees. Use forms of format approved by Departmental Representative.

1.12 COMMISSIONING
DOCUMENTATION

- .1 Submit the following documentation for use during commissioning and for incorporation thereafter into a Building Management Manual (BMM):
 - .1 Operations and Maintenance Manuals, Project Record Documents and other data as specified in Section 01 78 00. Data to include:

- 1.12 COMMISSIONING .1 (Cont'd)
DOCUMENTATION .1 (Cont'd)
(Cont'd)
- .1 Equipment Product Information (PI Data) complete with:
 - .1 Nameplate info.
 - .2 Installation instructions.
 - .3 Operating procedures and
 - .4 Maintenance guidelines.
 - .2 Reviewed shop drawings.
 - .3 As-built record drawings and Specifications.
 - .2 Completed Installation/Start-up Checklist sheets used.
 - .3 Performance Verifications checks and tests procedures and completed report sheets used.
 - .4 Copy of any static and dynamic test and reports conducted.
 - .5 TAB report and other reports as specified in various trade sections.
- .2 Above documentation is required by Commissioning Agent to commission Facility. Submit data minimum three (3) weeks before commencement of commissioning.
- .3 Documentation to include detailed information and number of copies as specified for maintenance manuals of section 01 78 00.
- .4 Commissioning Agent and Design Consultant will compile above documentation and produce a BMM manuals for operation/maintenance staff and tenant use.

