

1.1 DESCRIPTION
OF WORK

- .1 In general work of this contract consists of interior renovation to the passenger pre-board area including not limited to construction of a new security screening area and public washroom. The work shall be carried out in phases as indicated, operations will continue during the work.
- .2 The site of work is located at Wabush Airport in the province of Newfoundland and Labrador.

1.2 SITE
FAMILIARIZATION

- .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 temporary facilities required to perform the work.
- .2 Contact and obtain permission from the Departmental Representative before carrying out such site visit.

1.3 WORK SCHEDULE

- .1 Submit within 7 calendar days after contract award, a construction schedule showing commencement and completion of all work, including phasing within the time and phasing stated in the accepted bid.
- .2 Provide sufficient details in Schedule to clearly illustrate the entire implementation plan to achieve completion of the work on time and to monitor efficient use of resources and the progress of work in relation to established milestones.
- .3 Work Schedule shall include:
 - .1 Bar (Gantt) Chart indicating all work activities, their anticipated duration and planned dates for achieving major milestones and;
 - .2 Written narrative for key elements of work providing sufficient information to demonstrate a reasonable implementation plan.
- .4 Schedule work in cooperation with and to the approval of the Departmental Representative.

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| 1.4 WORK
<u>RESTRICTIONS</u> | .5 | Submit updates when requested by Departmental Representative. |
| | .1 | The work shall be carried out in phases as indicated. Facility operations shall continue during the work. Schedule and sequence work in cooperation with operators. Provide temporary security barriers to maintain existing level of security. After hours and weekend work may be necessary. All costs to be included in the tender price. |
| 1.5 OWNER SUPPLIED
EQUIPMENT | .1 | Existing security equipment will be re-used. Contractor to disconnect, relocated, reinstall, including temporary and permanent setups. |
| 1.6 CODES AND
<u>STANDARDS</u> | .1 | Perform work in accordance with the National Building Code of Canada (of latest edition as adopted by the province and municipality of the work location) and any other code of provincial or local application, including all amendments up to the bid closing date, provided that in any case of conflict or discrepancy the more stringent requirement shall apply. |
| | .2 | Perform electrical work in accordance with CSA C22.1-2006. Use only licensed electricians to carry out such work. |
| | .3 | Materials and workmanship must meet or exceed requirements of specified standards, codes and referenced documents. |
| 1.7 INTERPRETATION
<u>OF DOCUMENTS</u> | .1 | Supplementary to the General Conditions of the Contract, the Division 01 sections take precedence over the technical specification sections in other Divisions of the Specification Manual. |
| 1.8 TERM ENGINEER
<u></u> | .1 | Unless specifically stated otherwise, the term Engineer where used in the Specifications and on the Drawings shall mean the Departmental Representative and vice versa as defined in the General Conditions of the Contract. |

1.9 DOCUMENTS
REQUIRED

- .1 Maintain at job site, one copy each of the following:
 - .1 Contract Drawings and Specifications
 - .2 Work Schedule
 - .3 Health and Safety Plan and other safety documents related to the Work.
 - .4 Shop Drawings.
 - .5 Change Orders
 - .6 Field test reports.
 - .7 Reports received from various inspection authorities.

1.10 PERMITS

- .1 Obtain and pay for building permit, compliance certificates, licenses and other applicable permits as required by municipal, provincial and federal authorities to perform the Work.
- .2 Provide appropriate notifications of project to provincial and other authorities having jurisdiction.
- .3 Upon request, submit copy of applications made and permits received to Departmental Representative.

1.11 PROJECT MEETINGS

- .1 Project meeting will be held during the course of the work at least monthly.
- .2 Arrange project meetings and assume responsibility for setting times and recording minutes.
- .3 Have Superintendent and subcontractors in attendance.

1.12 SETTING OUT
WORK

- .1 Assume full responsibility for and execute complete layout of work.

1.13 ALTERATIONS
TO EXISTING BUILDING

- .1 Execute work with least possible interference or disturbance to Facility operations, occupants and the Public.
- .2 Provide barricades, temporary security partitions and doors, barriers and warning signs

around work areas and adjacent to areas in use by Facility occupants and the Public.

.1 Signage to be professionally made with bilingual message or use internationally recognized graphic symbols.

.3 Separate work areas from other interior areas of the building. In addition to the specified security partitions, provide dust barriers as specified in clause 1.16 below.

.4 Do not block fire exits and emergency escape routes. Ensure free egress from buildings at all times during the work.

.5 Follow Departmental Representative's directives in meeting above requirements.

1.14 WORK ACCESS

.1 Use only designated roads, walkways, entrance doors and corridors designated by Departmental Representative to gain access to work areas.

.2 Restrict movement of workers to immediate work areas. Plan work to minimize need for workers to circulate inside buildings of the Facility.

1.15 BUILDING SECURITY

.1 Keys, door security access cards building security access codes security passes may be issued to the Contractor, at the discretion of the Departmental Representative, to open locked doors access secure areas at the site for work purposes.

.2 Follow all instructions in regards to use, care and disposition of all keys and security cards issued.

.3 Unless indicated otherwise, keys and security access devices given to Contractor's Superintendent shall be for his/her sole possession shall not under any circumstances be shared with any worker or subcontractor.

.4 Do not, under any circumstances, make or allow workers to make duplicates of keys issued.

- .5 Immediately report to Departmental Representative any lost, stolen or destroyed keys and access cards.
- .6 At end of project, return all security devices to Departmental Representative.
- .7 Ensure building and other facilities of site are kept secure at all times. Lock all doors, activate building security system at end of each workday.
- .8 Cost incurred from police and security surveillance company resulting from falsely setting off security alarm system will be charged to the Contractor in the form of a financial assessment against the Contract.
- .9 Pay costs for after-hours security personnel, airport security personnel to be utilized.

1.16 TEMPORARY FACILITIES

- .1 Existing water and power supply may be used for construction at no cost. Departmental Representative will advise of the supply location.
 - .1 Be responsible for transporting such services to work areas.
- .2 Store materials on site only in location(s) as directed by Departmental Representative.
- .3 Enclose work areas with full height floor to ceiling metal stud walls with 13 mm painted gypsum board. Provide 914 x 2134 hollow metal doors steel frames with hardware and heavy metal dead bolt lock. Provide bilingual construction warning signs at prominent locations. All signage to be professionally made. Walls are also intended to maintain existing level of building security during the work period.
- .4 Dust Barriers:
 - .1 In addition to temporary walls and doors, erect full height dust tight partitions to separate works areas from others areas of the building.
 - .2 Provide additional dust covers as required for major dust generating work to stop propagation of dust beyond work areas.

.3 Obtain Departmental Representative's approval beforehand on the proposed dust barrier assembly and location.

.5 Provide sanitary facilities for work force in accordance with governing regulations and ordinances. Keep in sanitary conditions at all times.

.1 Assume that existing facilities at site cannot be used by workers unless directed otherwise by Departmental Representative.

1.17 HEATING AND VENTILATION

.1 Maintain existing heating, ventilation and air conditioning system operational within Occupied Areas during the entire course of work.

.2 Existing heating system may be used for construction purposes.

.3 Shut-down air distribution system in work areas from remainder of building. Seal ductwork, exhaust diffusers and grilles in work areas to stop spread of dust and fumes to Occupied areas of Facility.

.4 Provide suitable equipment and ventilate work areas as required to:

.1 Facilitate progress of work.

.2 Provide adequate ventilation to meet health regulations for safe working environment.

.3 Prevent accumulations of dust, fumes, mists, vapours or gases within building.

.4 Prevent harmful accumulation of hazardous substances into atmosphere.

.5 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.

.5 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

.6 Maintain strict supervision of operation of temporary ventilating equipment to:

.1 Conform with applicable codes and standards.

.2 Enforce safe practices.

.3 Prevent abuse of existing services provided by Departmental Representative.

1.18 CUTTING,
FITTING AND
PATCHING

- .1 Execute cutting fitting and patching required to make work fit properly.
- .2 Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work.
- .3 Do not cut, bore, or sleeve load-bearing members.
- .4 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.
- .5 Fit work airtight to pipes, sleeves, ducts, conduits and other services penetrating new or existing condition.
- .6 Openings made in existing fire rated walls, floors and ceilings shall be filled with purpose made, ULC approved, fire stopping materials and smoke seals.

1.19 EXISTING
SERVICES

- .1 Before commencing work, investigate and establish location and extent of concealed and buried service lines in area of work. Notify Departmental Representative of findings.
- .2 Where work involves breaking into, connecting or shutting down of existing services, obtain approval beforehand from Departmental Representative. Schedule and carryout work at time as directed by Departmental Representative with minimum of disturbance to Facility and site operations. Adhere to approved schedule and provide notice to affected parties.
- .3 Comply with electrical safety requirements specified in Section 01 35 26.
- .4 Protect, relocate or maintain existing active services as required. Where inactive services are encountered, cap off in manner approved by authority having jurisdiction over service. Record location of maintained, rerouted and abandoned service lines.

1.20 MATERIALS

- .1 Use new material and equipment unless otherwise specified.
- .2 Select and use products, adhesives and sealants which have:
 - .1 No or very low off-gassing levels.
 - .2 No or very little VOC content.
 - .3 Are least noxious and emit smallest amount of fumes, gases and strong odors during their cure period.
 - .4 Minimal chemical, physical or biological elements or agents in their composition which adversely affect human health and welfare or which degrades the environment.
- .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 one manufacturer for equipment or material of same type or classification unless otherwise specified.
- .5 Within 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 indicating compliance with specified requirements.
 - .4 Manufacturer's installation or application instructions.
 - .5 Evidence of arrangements to procure.
 - .6 Evidence of manufacturer delivery problems or unforeseen delays.
- .6 Obtain manufacturer's printed installation instructions and comply by such directives for installation of materials.
- .7 Notify Departmental Representative in writing of any conflict between Specifications and manufacturer's instructions, so that Departmental Representative will designate which document is to be followed.
- .8 Deliver, store and protect materials on site

against theft, vandalism, soiling and climatic damage. Provide additional suitable cover beyond manufacturer's packaging where required.

- .9 Touch-up factory finishes damaged by the Work. Use touch-up materials to match original. Do not paint over name plates.

1.21 FASTENERS

- .1 Provide metal fastenings and accessories in same texture, colour and finish as base metal in which they occur unless indicated otherwise. Prevent electrolytic action between dissimilar metals.
- .2 Use non-corrosive heavy duty fasteners, anchors and spacers for all fastening conditions. Space fasteners within limits of load bearing or shear capacity. Ensure positive permanent anchorage.

1.22 HAZARDOUS MATERIALS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling and storage, and disposal of hazardous materials.
- .2 Do not leave and store flammable and hazardous materials on site. Remove of site at end of each work shift.
- .3 Keep MSDS data sheets for all products brought on site. Provide copy to Departmental Representative. Refer also to Section 02 82 00 and Appendix "A".
- .4 Asbestos Discovery: Demolition of spray or trowel-applied asbestos can be hazardous to health. Should material resembling spray or trowel-applied asbestos be encountered in course of work, immediately stop work and notify Departmental Representative. Do not proceed with relevant work until written instructions have been received from Departmental Representative.

1.23 ENVIRONMENTAL PROTECTION

- .1 Have appropriate emergency spill response equipment and rapid clean-up kit on site. Provide personal protective equipment required for clean-up.

- .2 Report all spills of petroleum, hazardous materials and accidents having potential of polluting the environment to Federal and Provincial Department of the Environment and to the Departmental Representative.
- .3 Do not pump water containing suspended materials into sewer or drainage systems. Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with governing regulations and requirements.
- .4 Do not dump hazardous materials and polluted water containing suspended hazardous products into sewers and drainage systems. Dispose in accordance with federal and provincial environmental regulations and recommended procedures.
- .5 Fires and burning of waste and rubbish on site is prohibited.

1.24 INSPECTION AND TESTING

- .1 Give timely notice requesting inspection of work designated for inspections, special tests 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 Rejected Work: removal 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.
- .4 Tests on materials and equipment, is the responsibility of the Contractor except where specified otherwise.
 - .1 Provide all necessary instruments, equipment and qualified personnel to perform tests.
 - .2 At completion of tests, turn over two sets of fully documented tests reports to the Departmental Representative.

- .5 Unspecified tests may also be made by Departmental Representative. The costs of these tests will be paid for by the Departmental Representative.
- .6 Where tests or inspection reveal work not in accordance with the Contract, the Contractor shall bear the cost of additional tests and inspections incurred by Departmental Representative as required to verify the acceptability of corrected work.
- .7 If Contractor covers or permits to be covered work designated for special tests, inspections or approvals before such is made, uncover work until particular inspections or tests have been fully and satisfactorily completed and until such time as Departmental Representative gives permission to proceed. Pay costs to uncover and make good such work.

1.25 CLEANING

- .1 As work progresses, maintain work areas and site in a tidy, clean and dust free condition at all times.
- .2 Provide on-site covered, locked steel dumpster containers for placement of waste and debris. Loose and scattered waste, debris and materials will not be allowed on site.
- .3 Remove and dispose of waste and debris off site at end of each workday.
- .4 Clean interior of building used by workers and dirtied by work.
 - .1 Wash walls, floors and other surfaces as needed.
 - .2 Vacuum carpets.
 - .3 Dust all furnishings.
- .5 At project completion, conduct final cleaning of areas affected by work.
 - .1 Remove dust and dirt from all surfaces with recommended cleaning agents.
 - .2 Wash and polish finish surfaces.
 - .3 Wash clean pavements, rake clean grassed areas used.

- .6 Use competent persons experienced in commercial cleaning operations.
- .7 Meager attempt at controlling dust and ineffective cleaning will not be tolerated.
 - .1 Failure to provide effective dust control and/or perform proper cleaning by the Contractor will result in the Departmental Representative to proceed and obtain an independent commercial cleaning agency to perform all required cleaning to the satisfaction of the Facility tenant for which the costs will be charged to the Contractor in the form of a financial assessment against the Contract.

1.26 WASTE MANAGEMENT

- .1 Dispose of waste, debris and product packaging in accordance with municipal and provincial laws and regulations.
- .2 Plan work to minimize waste, maximize reuse and recycling of materials and to divert the greatest amount of waste from being disposed into landfill sites.
- .3 Separate waste, debris, leftover material, redundant equipment and product packaging at source, place into pre-planned waste categories during the course of the work and send to recycling facilities to maximum extent possible.
- .4 Store, handle and dispose of hazardous waste in accordance with applicable federal, provincial and municipal laws, regulations, codes and guidelines.
- .5 Upon request, submit written list of items salvaged and sent to recycling facility

1.27 COST BREAKDOWN

- .1 Before submitting first progress claim, submit a breakdown of the contract price in format and detail as directed by Departmental Representative.

1.28 ACCEPTANCE

- .1 Notify Departmental Representative in writing when work is complete and ready for final inspection.

- .1 Make a check of all work and correct all discrepancies, defects and outstanding work before sending notification.
- .2 Accompany Departmental Representative during final inspection.
- .3 Rectify all defects, faults and outstanding items identified by Departmental Representative during inspection.

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 21
 - .4 Environmental Plan specified in section 01 35 43
 - .5 Health and Safety Plan specified in section 01 35 30
 - .6 Hot Work Procedures specified in section 01 35 24
 - .7 Lockout Procedures specified in section 01 35 25
 - .8 Dust Control Plan specified in section 01 50 00.
 - .9 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 Work schedule within 7 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 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 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;
 - .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.

.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 Work Schedule, items identified by Departmental Representative during review of schedule.

.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 Ensure that all subtrades and subcontractors are made aware of the work restraints and operational restrictions specified.

.10 Schedule Updates:

.1 Submit on a monthly basis.

.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 PROJECT PHASING

- .1 Be aware that Facility and tenants 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 Perform Work of this contract in three individual phases as indicated on the phasing drawings.
- .3 Unless indicated or approved otherwise, complete all work of a particular phase prior to commencement of another phase. Obtain Departmental Representative's permission prior to moving between phases.

1.4 OPERATIONAL RESTRICTIONS

- .1 The Contractor must recognize that building occupants will be affected by implementation of this contract. The Contractor must perform the work with utmost regard to the safety, security 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 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,

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Off-Hours are defined as follows:

.1 Weeknight Off-Hours: between the hours of 18:00 and 07:00 for each weekday Monday to Thursday inclusive.

.2 Weekend Off-Hours: between the hours of 18:00 Friday evening to 07:00 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.

.5 The following work shall be performed during Off-Hours:

.1 Erection and dismantling of dust barriers, hoarding or other protective devices to separate areas of Facility occupied and under use by public and tenants from work areas;

.2 Asbestos abatement;

.3 Demolition of any masonry or concrete inside building;

.4 All work involving saw cutting or boring of openings through masonry and concrete walls, floors, ceilings or roof;

.5 Work which requires the use of products controlled by WHMIS and for which MSDS sheets indicate toxic or hazardous materials requiring special handling and application procedures;

.6 Use of materials having high solvent content or other content emitting strong noxious fumes or odours;

.7 Painting;

.8 Removal of demolition debris from the building including cleaning of premises;

.9 Cleaning and preparing of occupied areas for daytime use by tenants immediately following an off-hour workshift;

.10 Work within a tenant occupied area including corridors, stairwells and other circulation routes under use;

.11 Work which requires the temporary disconnection of power and communication services to occupied areas;

.12 Testing of fire alarms and other emergency annunciating system;

.13 Delivery of materials and equipment from exterior to the interior of building when access routes are located in tenant occupied spaces.

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- .14 Work which creates excessive noise or vibration creating interference with tenant operations.
 - .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.
 - .7 Ensure that 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 price for the work. No extra cost will be paid due to failure by General Contractor or his 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 Limited Maneuvering Space on Site:
 - .1 The work will take place at both public and secure sites within an existing operational airport terminal space within the building, loading and parking space outside the building are limited.
 - .10 Facility circulation maintained:
 - .1 Ensure that entrances, corridors, stairwells, fire exits and other circulation routes are maintained free and clear providing safe and uninterrupted passage for Facility users and public at all times during the entire work.
 - .2 Maintain those areas clean and free of construction materials and equipment. Provide temporary dust barriers and other suitable enclosures to ensure users are not exposed to construction activities and are protected from exposure to dust, noise and hazardous conditions.
 - .3 Provide temporary corridors, walkways, passageways, access to offices, etc... when required due to nature of work. Such circulation routes must be constructed to barrier free

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requirements unless approved otherwise by Departmental Representative.

.4 Maintain fire escape routes accessible and firefighting access open all times for the duration of the project.

.5 Do not under any circumstances block fire exit doors. Do not leave construction materials or debris in corridors, stairwells building entrances and exits.

.11 Safety Signage:

.1 Provide on site, and erect as required during progress of work, proper bilingual 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 price.

.12 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.

.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 Disconnect and seal-off ductwork of HVAC servicing the construction area to stop spread of dust into other areas of Facility.

.7 Avoid situations and practices which results in dust and dirt being brought from the construction areas or from the exterior and tracked inside the building into occupied areas used by tenants and the public.

.8 Stop workers with soiled footwear from entering building. This includes roofing mechanics and heavy civil workers.

.9 Inform workers and make them sensitive to the need for dust and dirt control. Stringently enforce rules and regulations, immediately address non-compliance.

.10 Keep access doors to work areas closed at all times. Use only designated doors for entry or egress.

.13 Work in Occupied Areas:

.1 Where work must be carried out in an occupied area beyond the boundaries of the enclosed construction site, perform such work during the non-operational off-hour periods of the Facility.

.2 Ensure that all dust, dirt, debris, construction waste, materials, tools and equipment are completely removed at the end of each "off-hour" workshift. Clean and reinstate area ready for daytime use by tenant.

.3 Provide temporary dust barriers around immediate work areas and place fabric drop sheets over workstations, equipment and other furnishings located immediately adjacent to such work.

.4 Conduct work in such a way as to minimize the creation of dust and to avoid contaminating areas beyond the immediate location.

.5 Discuss and obtain Departmental Representative's approval beforehand on the type and extent of dust barriers, protective devices and measures needed.

.6 Be responsible for temporarily moving office furnishings, workstations, computer equipment and other objects as needed to gain access and conduct work. Reinstall all dislocated items at end of each workshift making the area operational again.

.7 Disconnect and reconnect any power and communications systems feeding workstations as

required.

.8 Clean such areas as well as those corridors and routes used to gain entry and access.

.14 Cleaning of tenant occupied areas used by Contractor:

.1 Clean lobbies, corridors, stairs and other circulation routes used by workers to gain access to work by conducting cleaning, vacuuming and washing of floors, walls and other soiled surfaces.

.2 Obtain and pay for the services of a professional cleaning company to perform this cleaning. Cleaning staff shall remain on site one hour beyond the end of each off-hour workshifts to address any Tenant complaints or concerns and carryout additional cleaning functions as directed by Departmental Representative or by a pre-designated person(s) representing the tenant(s).

.3 Meager attempts at controlling dust and ineffective unprofessional cleaning procedures will not be tolerated.

.4 Failure to provide effective dust control, allowing construction dust and dirt to escape beyond construction areas and contaminate occupied areas and building circulation areas will result in Contractor being ordered to immediately provide professional cleaning services without delay to remedy the situation and conduct all cleaning to the extent as determined by Departmental Representative. Alternatively, Departmental Representative may, at certain times and at own discretion; obtain the services of an independent building cleaning agency when cleaning being provided by Contractor is ineffective or tardy in response. Costs of such services will be charged against Contractor in the form of financial penalties or holdback assessments against the Contract.

.15 Ensure that all sub-trades are made aware of and abide by the contents of this section and in particularly the work restrictions specified herein due to tenant operational requirements.

1.5 PROJECT MEETINGS

.1 Schedule and administer project meetings, held on a minimum-monthly basis, for entire duration of work and more often when directed by

Departmental Representative as deemed necessary due to progress of work or particular situation.

- .2 Prepare agenda for meetings.
- .3 Notify participants in writing 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 mail or by facsimile within 3 calendar days after each meeting.
 - .3 Make revisions as directed by Departmental Representative.
 - .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

- .1 The General Contractor is responsible for coordinating 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 Coordinate relocation and reinstallation of owner's existing security equipment with owner so as to permit airport operations and security procedures to continue.
- .2 The General Contractor shall convene meetings between trades whose work interfaces and ensure that they are fully aware of the areas and the extent of where interfacing is required.
 - .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.
- .4 Work Cooperation:
- .1 Ensure cooperation between trades in order to facilitate the general progress of the work and avoid situations of spatial interference.
 - .2 Ensure that 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.

1.7 OTHER CONTRACTS

- .1 Further contracts may be let during the period that this contract is in progress.
- .2 Cooperate with other Contractors in carrying out

their respective works and carry out all instructions from the Departmental Representative in this regard.

- .3 Connect properly and coordinate work with that of other Contractors. If any part of the work under this Contract depends for its proper execution or result upon the work of another Contractor, report promptly to the Departmental Representative, in writing, any defects in the work of such other Contractors as may interfere with the proper execution of this work.

- 1.1 GENERAL .1 The Departmental Representative will supply certain material and equipment in the Contract for installation and incorporation into the Work by the Contractor.
- 1.2 MATERIAL SUPPLIED .1 Departmental Representative will supply the following materials to the Contract:
.1 Existing security equipment
.2 New security equipment
- .2 The above noted items will be delivered and turned over to the Contractor at the site of work, or may already be on site and in use.
- 1.3 DELIVERY REQUIREMENTS .1 Materials supplied by the Departmental Representative will be turned over to the Contractor immediately upon receipt.
- .2 Within 3 calendar days of receipt of material supplied by Departmental Representative, the Contractor must:
.1 Conduct a complete audit to verify that all materials have been received, including loose parts and accessories associated with a particular item;
.2 Acknowledge receipt, identify any missing or damaged items, in writing;
.3 Provide copy of delivery slips submitted by manufacturer and shipping company.
- .3 Unless shortages of material or damaged items are identified in writing to the Departmental Representative within the above specified period, the Contractor will become responsible to supply all missing materials and repair or replace damaged items and missing parts discovered thereafter at own expense.
- .4 Failure to make a complete check of supplied materials or to acknowledge receipt of same shall not relieve Contractor's responsibility to replace or repair any item subsequently found to be missing or damaged.
- .5 Departmental Representative will make final determination as to whether an item can be repaired or must be replaced.

- .6 In the event of failure on the part of the Contractor to submit written proof within the specified verification period, Departmental Representative reserves the right to:
 - .1 Proceed with the supply or repair of missing items through independent sources and;
 - .2 Charge costs of such items, including related shipping charges, to the General Contractor through financial holdback assessments against the Contract.

1.4 CONTRACTOR'S DUTIES

- .1 Take possession of the new and existing supplied material immediately upon delivery to the site by shipping company.
- .2 Promptly inspect delivered material. Report missing, damaged or defective items in writing to Departmental Representative in accordance with delivery requirements specified above.
- .3 Obtain and pay costs to load and transport to work area.
- .4 Unload and handle at site, including lifting, uncrating etc.
- .5 Store material on site at a location designated by Departmental Representative. Protect against inclement weather and site damage by use of appropriate covers.
- .6 Make all arrangements and pay associated costs to provide temporary storage from date of receipt and until ready for incorporation into the work.
 - .1 Type and location of storage to meet with Departmental Representative's approval.
- .7 Be responsible for the protection of such material against damage, loss, theft and fire from date of receipt, and until final installation of work is accepted by the Departmental Representative.
- .8 Any damage or loss of such material shall result in the Contractor being responsible for replacement or repair of equipment at no additional cost to the Contract.
- .9 The decision as to whether damaged items may be repaired or must be replaced with new equipment

shall be the Departmental Representative's decision.

- .10 Install such material and equipment and incorporate into the work. Perform assembly and make all connections as required to make item functional.
- .11 Dispose of containers, crating and protective covering off site.
- .12 Protect, temporarily disconnect, move, store, reassemble, install and hook-up mechanical and electrical services, data, test, commission existing security equipment being reused.

1.1 SUBMITTAL
GENERAL REQUIREMENTS

- .1 Submit shop drawings, product data, samples and other items specified for review by Departmental Representative.
- .2 Submit sufficient copies for own use plus 3 copies which will be kept by Departmental Representative.
 - .1 Include additional copies for insertion into the O & M manuals specified in section 01 78 00.
- .3 Accompany data with transmittal letter identifying project name, project number, Contractor's name and address, supplier name, description of items and quantity of drawings/data being submitted.
- .4 Allow 14 calendar days for review of shop drawings by Departmental Representative. Note that colours can only be selected after all shop drawings and samples of products requiring colour selections are received by the Departmental Representative.
- .5 Do not proceed with work applicable to shop drawing item until relevant submission has been reviewed by Departmental Representative.
- .6 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.
- .7 Present data, dimensions and engineering values in SI Metric units.
- .8 Review submittals prior to submission. Ensure that all requirements have been addressed, field dimensions and data have been taken and submittal has been checked and coordinated with work of contract documents.
- .9 Stamp and sign each item of submittal certifying contractor's review and verification of submitted data.

- .10 Submittals not stamped and signed will be returned unexamined by Departmental Representative and considered rejected.

1.2 SHOP DRAWINGS

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, technical product data, brochures and other data which are to be provided by Contractor to illustrate details of a portion of work.
- .2 Shop Drawings Content:
 - .1 Indicate materials, methods of construction, attachment, connections, explanatory notes and other information necessary for completion of work. Where items attach or connect to other items, confirm that all interrelated work has 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 Shop Drawings Format:
 - .1 Opaque white prints or photocopies of original drawings or standard drawings modified to clearly illustrate work specific to project requirements. Maximum sheet size to be 1000 x 707 mm.
 - .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.
- .4 Delete information not applicable to project on all submittals.
- .5 Adjustments or corrections made on shop drawings by Departmental Representative are not intended to change contract price. If adjustments affect value of work, advise Departmental Representative in writing prior to proceeding with work.

- .6 After Departmental Representative's review, distribute copies.
- .7 The review of shop drawings by Departmental Representative or by a Consultant or designated person so authorized by the Departmental Representative, 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.

1.3 SAMPLES

- .1 Submit samples for items specified in trade sections. Label with origin and intended use.
- .2 Deliver samples to Departmental Representative's office. Do not drop off samples at construction site except for special circumstances pre-approved by Departmental Representative.
- .3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.

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| <u>1.1 SECTION INCLUDES</u> | .1 | Fire Safety Requirements |
| | .2 | Hot Work Permit |
| | .3 | Existing Fire Protection and Alarm Systems |
| <u>1.2 RELATED WORK</u> | .1 | Section 01 35 30 Health and Safety Requirements |
| <u>1.3 REFERENCES</u> | .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: |
| | .1 | http://www.hrsdc.gc.ca/en/lp/lo/fp/standards/commissioner.shtml |
| | .2 | Fire Protection Services - Atlantic Region office, Halifax, N.S, Tel. (902) 426-6053. |
| <u>1.4 DEFINITIONS</u> | .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. |
| <u>1.5 SUBMITTALS</u> | .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. |
| <u>1.6 FIRE SAFETY REQUIREMENTS</u> | .1 | Implement and follow fire safety measures during Work. Comply with following: |
| | .1 | National Fire Code. |
| | .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 |

1.7 HOT WORK AUTHORIZATION

- .1 Obtain Departmental Representative's written "Authorization to Proceed" before conducting any form of Hot Work on site.
- .2 To obtain authorization 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.
- .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 30.
 - .2 Use of a Hot Work Permit system with individually written permit issued by Contractor's Superintendent to specific 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 shall 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.
- .5 Brief all workers and subcontractors on Hot Work Procedures and of Permit system. Stringently enforce compliance.
- .6 Failure to comply with fire safety procedures may result in the issue of a Non-Compliance notification as specified in Section 01 35 30.

PERMIT

- .2 Permit to be typewritten form. Industry Standard forms shall only be used if all data specified above is included on form.

AND ALARM SYSTEMS

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

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.

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| <u>1.1 SECTION INCLUDES</u> | .1 | Procedures to isolate and lockout electrical facility and other equipment from energy sources. |
| <u>1.2 RELATED WORK</u> | .1 | Section 01 35 30: Health and Safety. |
| <u>1.3 REFERENCES</u> | .1 | CSA C22.1-06 - Canadian Electrical Code, Part 1, Safety Standard for Electrical Installations. |
| | .2 | CAN/CSA C22.3 No.1-06 - Overhead Systems. |
| | .3 | CSA C22.3 No.7-06 - Underground Systems. |
| | .4 | COSH: Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code. |
| <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. |
| | .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 practice as applicable to mechanical equipment or other machinery being de-energized.
 - .4 Procedures specified herein.
- .2 In event of conflict between any provisions of above authorities the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on the course of action to be followed.

1.6 SUBMITTALS

- .1 Submit copy of proposed lockout procedures and sample of lockout permit or lockout tags to Departmental Representative for review, within 14 calendar days of acceptance of bid.
- .2 Submit in accordance with section 01 33 00.

1.7 ISOLATION OF
EXISTING SERVICES

- .1 Obtain 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.
- .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 its 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 shutdown 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 30.

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.

.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 shall 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.
 - .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.
- .2 Failure to follow lockouts procedures specified herein may result in the issuance of a Non-Compliance notification as specified in section 01 35 30.

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.

1.1 ELECTRICAL
SAFETY

- .1 Ensure electrical power and other source of energy to equipment and electrical facilities are effectively disconnected and locked out before proceeding with work on such items.
- .2 Locate power source, isolate and lockout service feed and provide a guarantee of isolation to worker(s) before commencing any electrical work.
 - .1 Conduct hazard assessment as part of process.
- .3 Develop and implement lockout procedures, complete with the use of lockout tags, to be followed on site to ensure that electrical power and other sources of energy are effectively disconnected and locked out in accordance with Canadian Electrical Code and Provincial and Federal health and safety regulations.
 - .1 Contractor's Superintendent shall issue and control the distribution of lockout tags to workers for each lockout event.
- .4 Submit Contractor's written lockout procedures and sample of lockout tag to be used on project to Departmental Representative.
- .5 Obtain Departmental Representative's approval before disconnecting existing services to ensure minimum disruption to Facility operations.

1.2 FIRE SAFETY

- .1 Abide by National Fire Code of Canada and fire protections standards FCC 301 and FCC 302 published by Fire Protection Services, Labour Program Division of Service Canada.
- .2 FCC standards may be viewed at the following web site:
 - .1 <http://www.hrsdc.gc.ca/en/lp/lo/fp/standards/commissioner.shtml>
- .3 Obtain approval from Departmental Representative before conducting Hot Work inside or adjacent to building.
- .4 Hot Work defined as:
 - .1 Welding
 - .2 Use of torch or other open flamed device
 - .3 Grinding with equipment which produces sparks

- .5 Approval will be given upon receipt and confirmation that the following procedures shall be carried out by the Contractor:
 - .1 Hazard assessment for each hot work event and location.
 - .2 Fire safety procedures and work practices will be implemented and stringently followed for each event.
 - .3 Use of a hot work permit system, issued by Contractor's Superintendent to worker conducting the hot work.
 - .4 Fire watch by a designated person for a minimum of 1 hour immediately upon completion of the hot work.
- .6 Submit Contractor's written fire safety procedures and practices to be used on project to Departmental Representative.

1.3 FIRE PROTECTION AND ALARM SYSTEMS

- .1 Fire protection and alarm systems shall not be:
 - .1 Obstructed.
 - .2 Shut-off, unless approved by 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 firefighting.
- .3 Any costs incurred from the fire department and charged to the Facility owner resulting from negligently setting off false alarms will be transferred to the Contractor in the form of financial holdback assessment against the Contract.

1.4 DOCUMENTS ON SITE

- .1 Keep copy of Lockout tags, 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.

1.1 RELATED WORK

- .1 Section 01 35 26: Electrical and fire safety requirements.

1.2 COMPLIANCE REQUIREMENTS

- .1 Comply with the Occupational Health and Safety Act for the Province of Newfoundland & Labrador and the Regulations made pursuant to that Act.
- .2 Comply with Canada Labour Code Part II, and the Canada Occupational Safety and Health Regulations made under Part II of the Canada Labour Code.
- .3 Observe and enforce construction safety measures required by:
 - .1 National Building Code of Canada;
 - .2 Provincial Worker's Compensation Board;
 - .3 Municipal statutes and ordinances.
- .4 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.
- .5 Maintain Workers Compensation Coverage for duration of Contract.

1.3 SITE SAFETY

- .1 Be responsible for health and safety of persons on site, of property and for protection of persons and the general public circulating adjacent to work areas to extent that they may be affected by conduct of Work.
- .2 Designate one person from own workforce as site Safety Officer to be on site at all times and be responsible for health and safety of the work site. Provide name to Departmental Representative.
- .3 Assign responsibility, obligation and authority to Safety Officer to stop work as deemed necessary for reasons of health and safety.
- .4 Conduct safety inspections of the work and tool box safety meetings with workers on a regular basis.
- .5 Control access to work areas and grant entry only

to workers and authorized persons.

.1 Brief all persons of site hazards, safety rules and personal protective equipment (PPE) to be donned on site before entry is permitted.

.2 Enforce compliance of site safety rules by all persons granted access.

1.4 HAZARD ASSESSMENTS

.1 Perform health and safety hazard assessments as integral part of the work. Conduct:

.1 Before commencement of work and;

.2 On an on-going process during entire course of the work.

.2 Identify risks and hazards resulting from site conditions, weather conditions and work operations.

.3 Record results in Health and Safety Plan.

1.5 HEALTH AND SAFETY PLAN

.1 Develop written site-specific Project Health and Safety Plan, based on hazard assessments, prior to commencement of the work.

.1 Submit Plan to Departmental Representative for review within 7 calendar days after of Contract Award.

.2 Plan shall contain three (3) parts as follows:

.1 Part 1: health risks and safety hazards identified by hazard assessments.

.2 Part 2: safety measures to prevent or mitigate identified risks and hazards.

.3 Part 3: emergency procedures and communications response to be followed for all incidents and accidents, including names and telephone numbers of persons to contact.

.3 Coordinate Plan with the Facility's Emergency Response and Evacuation Plan. Departmental Representative will provide pertinent data, including contact names of PWGSC and Facility management.

.4 Post Plan on site. Enforce compliance by all workers.

.5 As work progresses, revise Plan to reflect additional health risks and safety hazards identified by hazard assessments.

- .6 Submission of the Health and Safety Plan, and updates, to the Departmental Representative is for review and information purposes only. Departmental Representative's receipt, review and any comments made of the Plan shall not be construed to imply approval in part or in whole of such Plan by Departmental Representative and shall not be interpreted as a warranty of being complete and accurate or as a confirmation that all health and safety requirements of the Work have been addressed and that it is legislative compliant. Furthermore, Departmental Representative's review of the Plan shall not relieve the Contractor of any of his legal obligations for Occupational Health and Safety provisions specified as part of the Work and those required by provincial legislation.

1.6 ACCIDENT
REPORTING

- .1 Report all incidents and accidents to authorities having jurisdiction and to Departmental Representative.

1.7 SITE RECORDS

- .1 Maintain on site a copy of all health and safety documentation specified to be produced as part of the work and received from authorities having jurisdiction.

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| <u>1.1 RELATED WORK</u> | .1 | Waste Management and Disposal: Section 01 74 21. |
| <u>1.2 DEFINITIONS</u> | .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. |
| <u>1.3 FIRES</u> | .1 | Fires and burning of rubbish on site not permitted. |
| <u>1.4 HAZARDOUS MATERIAL HANDLING</u> | .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. |
| | .5 | Transport hazardous materials in accordance with federal Transportation of Dangerous Goods Regulations and applicable Provincial regulations. |
| <u>1.5 DISPOSAL OF WASTES</u> | .1 | Do not bury rubbish and waste materials on site. Dispose in accordance with project waste management requirements specified. |
| | .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.

1.6 POLLUTION
CONTROL

- .1 Maintain temporary erosion and pollution control features during this contract.
- .2 Control emissions from equipment and plant to local authorities' emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris.
- .5 Have appropriate emergency spill response equipment and rapid clean-up kit on site located adjacent to hazardous materials storage area. Provide personal protective equipment required for clean-up.

1.1 GENERAL

- .1 Be aware that security regulations pertaining to control of construction personnel are in force at the site. It is the Contractor's responsibility to become familiar with and abide by such regulations.
- .2 In general, the Department of Transport, through the Airport Manager's Office, will be responsible for and provide the required security during the length of the construction to the extent of:
 - .1 Providing briefing on security regulations and rules before work commences;
 - .2 Interpreting points of conflict in respect to security, as necessary;
- .3 The contractor will be responsible for and provide the required security functions during the length of the construction to the extent of:
 - .1 Providing gate attendants at restricted area entry and exit points, as necessary;
 - .2 Providing escort and surveillance function through the hiring and payment of Commissionaires and/or Security Guards, as necessary.
- .4 Be aware that security personnel conducting surveillance and escort functions over Contractor and his workers, must be in possession of a Permanent Airport Restricted Area Pass.
- .5 The above clauses does not negate the fact that the Contractor still requires Temporary Airport Restricted Area Passes for all workers who need access to restricted areas of the airport as specified in clause 2.6 below.
- .6 As well, the Contractor is responsible for briefing all workers and subcontractors in respect to the security regulations and to ensure that they abide by all rules and regulations.
- .7 An infraction of airport security regulations by a worker or subcontractor will result in financial penalties in the form of progress payment reduction or holdback assessments being levied against the Contractor.

Any subsequent infractions will, at the discretion of the Departmental Representative, result in removal of the offending party from the airport property.

1.2 SECURITY PASSES

- .1 Site security is mandatory when working in restricted areas of the Airport. All areas inside the airport security fence are considered restricted areas.
- .2 All persons from Contractor's or subcontractor's workforce must be escorted and be under constant surveillance when located in restricted areas of the airport.
 - .1 The permanent pass holder must maintain visual contact at ALL times with persons under escort to ensure compliance with all security regulations.
- .3 The ratio of security personnel to workers under surveillance while working in restricted areas shall be 1 to 20.
- .4 The Contractor is solely responsible for the procurement of Security Personnel to provide the security surveillance and escort functions needed for Contractor to perform the work of this contract .
- .5 All workers at the site who need access to restricted areas must be issued a Temporary Restricted Area Pass.
- .6 The Contractor shall be responsible for making the application to the Airport Security and Protective Services Office for all passes needed by workers before work commences, including those required by subcontractors.
- .7 The Contractor remains responsible for all passes issued to workers.
- .8 When barricades are installed within restricted areas, delineating construction area(s), ensure that they remain in place as work progresses and that workers fully understand the areas within which they must remain confined.

- .9 For the duration of the project, anyone not in possession of and visibly displaying a Temporary Airport Restricted Area Pass will not be allowed access to restricted areas.
- .10 At end of project, the Contractor shall return all passes issued to workers to the Airport Security and Protective Services Office. The Departmental Representative will levy a financial penalty in the form of a holdback assessment against the Contract for each pass not returned regardless of the reason the pass is not returned.
- .11 The Contractor must immediately report any lost, stolen or destroyed passes through the Departmental Representative to the Security and Protective Services Office.

1.3 KEYS

- .1 Keys and/or Key cards necessary for access to restricted areas will only be issued to Permanent Restricted Area Pass Holders.

1.4 SITE SECURITY

- .1 Access to the work areas of the site will be through pre-determined routes.
- .2 Security personnel will control access/egress at each gate used by the Contractor's personnel to enter or leave the work site. This individual will record all temporary and visitor passes issued in a daily log and collect all passes returned at the end of the working day.

1.5 VEHICLE ACCESS TO RESTRICTED AREAS

- .1 Security personnel with a valid AVOP permit will provide escort service for the benefit of the Contractor's vehicle(s) requiring access to restricted areas.
- .2 Under no circumstances shall the Contractor operate any vehicle within restricted areas without the knowledge, approval and accompaniment of the designated escort vehicle.
- .3 All instructions from the security personnel providing the escort service must be instantly obeyed.

- 1.6 MATERIAL DELIVERIES .1 Material and equipment delivery vehicles must be met at the security gate and be escorted to the unloading site inside restricted areas by an escort vehicle.
- .2 Under no circumstances and at no time shall a delivery vehicle be allowed to manoeuver within restricted areas unescorted.
- .3 After unloading, the delivery vehicle shall be immediately escorted back to and through the security gate.

- 1.7 WORK AFTER NORMAL .1 When work is to be done within restricted areas
WORKING HOURS after normal working hours or beyond the pre-determined hours of work, notify the Departmental Representative sufficiently in advance of areas and times to coordinate security services and keep airport operation informed.

1.1 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.

1.2 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.
- .2 At completion of tests, turn over 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.
- .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.

1.3 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, adjustment and balancing of mechanical and electrical equipment and other building systems.
 - .4 Performance verification tests before building commissioning procedures commences.
 - .5 Mill tests and certificates of compliance.
 - .6 Tests as specified within various sections designated to be carried out by Contractor under the supervision of Departmental Representative.
 - .7 Air quality monitoring and testing during hazardous materials abatement.
 - .8 Additional tests as specified in Clause 1.3.4 above.
- .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.
- .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.

1.4 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.

1.5 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.

1.6 MOCK-UPS

- .1 Prepare mock-ups of certain work as specified in various sections of the Specifications. Include in each mock-up all related work components representative of final assembly.
- .2 Construct in locations acceptable to Departmental Representative.
- .3 Prepare mock-ups for Departmental Representative's review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.
- .4 Failure to prepare mock-ups in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .5 If requested, Departmental Representative will assist in preparing a schedule fixing dates for preparation.

- .6 Dismantle and remove mock-up when directed by Departmental Representative, unless approval is given for mock-up to remain as part of the Work.

1.1 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 The Contractor is advised that while parking facilities for his workers and subcontractors MAY 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.

1.2 BUILDING ACCESS

- .1 Use only access doors, and circulation routes within building as designated by Departmental Representative to access interior work.

1.3 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 is limited. Coordinate delivery to minimize storage period on site before being needed for incorporation into work. Storage within the building is not available.

1.4 INTERIOR HOARDING

- .1 Erect hoarding inside building to isolate construction areas, protect occupants and public and maintain security for duration of work.
- .2 Construct hoarding as follows:
 - .1 Height: to underside of ceiling above.
 - .2 Framing type: 89 mm metal stud spaced at 400 mm oc
 - .3 Covering: 12 mm thick painted gypsum board, finished and painted: .
 - .4 Sealed to abutting surfaces.
 - .5 Access Doors: 1 quantity steel pedestrian door dust tight lockable.
 - .6 Scribed to underside and profile of ceiling above.

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| 1.5 INTERIOR DUST
CONTROL AND
<u>DUST BARRIERS</u> | .1 | Control creation and spread of dust and dirt to building interior and in particular to areas within premises still under use by occupants. |
| | .2 | Develop and implement a dust control plan, addressing effective measures to carry out work with least amount of dust being created and propagated. <ul style="list-style-type: none">.1 Carefully evaluate the type of work to be undertaken and the physical layout of each work area on site..2 Provide specifically tailored strategy for each work area..3 Pre-determine location and placement of dust barriers to confine resulting dust to immediate work area..4 Inform Departmental Representative of the proposed dust control measures to be followed at each work area and for each major dust generating activities. Obtain Departmental Representative's approval before proceeding with work. |
| | .3 | Dust control plan to incorporate as a minimum the following dust protection and cleaning requirements: <ul style="list-style-type: none">.1 Erect dustproof partitions in addition to construction hoarding specified in 1.4 above completely around work area to fully isolate construction from other parts of the buildi<ul style="list-style-type: none">.1 Erect from floor to underside of ceiling above, sheeting applied to occupied side of partition..2 Scribe, cut and fit sheathing tight to shape of structural steel, deck profile and to other obstructions in ceiling space and abutting walls..3 Use compressible neoprene gaskets around perimeter of partition and at all protrusions to achieve airtight construction..4 Where partition is exposed to public view, tape and finish drywall joints and paint surface to color approved by the Departmental Representative..3 Provide a "dust tight" and lockable access door(s) within dust partition or between rooms for worker entry into work area. This is of particular importance for situations where excessive dust will be generated. |

.4 Provide additional dust barriers, placed tightly to underside of the floor/roof deck above, in locations where existing walls are used as part of the dust barrier system but simply terminate at the finished ceiling level resulting in an open space above, or other similar condition, permitting dust to migrate beyond the construction areas.

.5 Make all dust barriers airtight, effectively blocking and stopping all dust migration.

.6 Inspect dust barriers at various intervals during each work shift. Immediately fix tears, unsealed edges and maintain barriers effectively sealed for the entire work duration.

.7 Shut down existing ventilation system feeding construction space, or disconnect and seal-off supply and return air ducts to stop dust from contaminating other areas.

.8 Immediately clean areas in use by occupants and public contaminated by work.

.1 Vacuum carpets, wash floors and walls. Remove accumulated dust from all surfaces. Clean and remove smears, scuffs and marks.

.4 Meager attempts at controlling dust will not be tolerated. Failure to provide effective dust control during work and to perform satisfactory cleaning thereafter will result in Departmental Representative to proceed and obtain a separate cleaning service agency to perform cleaning to tenant's satisfaction with cost for such services being charged against this Contract in the form of financial holdbacks.

.5 Obtain Departmental Representative's approval before erecting any dust partitions simply to underside of finish ceiling.

.6 Construction of dust barriers, enclosures and placement of temporary protective devices to be performed during Facility non-operational off-hour periods.

1.6 SANITARY FACILITIES

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

.2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

- .3 Sanitary facilities are available at the site and may be used by Contractor's work force. Make arrangements for the use of such facilities through the Departmental Representative.
- .4 When permanent water and drain connections are completed, provide temporary water closets and urinals complete with temporary enclosures, inside building. Permanent facilities may be used on approval of Departmental Representative.

1.7 POWER

- .1 Power supply is available and will be provided for construction usage at no cost.
 - .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 Canadian Electrical Code.
- .2 Provide and pay all costs to supply and install temporary cabling, panel boards, 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 Canadian Electrical Code, in compliance with the federal and provincial Occupational Health and Safety Regulations as specified in section 01 35 30 and to lockout requirements specified in section 01 35 25.
- .3 Provide and maintain temporary lighting to conduct work. Ensure illumination level is not less than 162lx in all locations.
- .4 Electrical power and lighting systems installed under this Contract can be used for construction requirements provided that guarantees are not affected thereby. Make good damage. Replace lamps which have been used over period of 3 months.

1.8 WATER SUPPLY

- .1 Water supply is available in existing building and will be provided for construction usage at no cost. Make arrangements for the use and

transportation of such services to work area through the Departmental Representative.

- .2 Permanent water supply system installed under this Contract can be used for construction requirements provided that guarantees are not affected thereby. Make good damage.

1.9 SCAFFOLDING

- .1 Design, construct and maintain scaffolding in rigid, secure and safe manner in accordance with CAN/CSA-S269.2-M87(R2003).
- .2 Erect scaffolding independent of walls. Remove when no longer required.

1.10 HEATING AND VENTILATING

- .1 Provide temporary ventilation in enclosed areas as required to:
 - .1 Facilitate progress of work.
 - .2 Provide adequate ventilation to meet health regulations for safe working environment.
- .2 Ventilating:
 - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
 - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
 - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
 - .4 Ventilate storage spaces containing hazardous or volatile materials.
 - .5 Ventilate temporary sanitary facilities.
 - .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
- .3 Maintain strict supervision of operation of temporary ventilating equipment to:
 - .1 Conform with applicable codes and standards.
 - .2 Enforce safe practices.
 - .3 Prevent abuse of services.
 - .4 Prevent damage to finishes.
- .4 Submit bid assuming existing or new equipment and systems will be used for temporary heating.

- .5 Upon acceptance of bid, Departmental Representative may permit use of permanent system providing agreement can be reached on:
 - .1 Conditions of use, special equipment, protection and maintenance.
 - .2 Saving on Contract price.
 - .3 Provisions relating to warranties on equipment.

1.11 CONSTRUCTION
SIGN AND NOTICES

- .1 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 conforming to CAN3-Z321-96(R2006).
- .2 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.

1.12 REMOVAL OF
TEMPORARY
FACILITIES

- .1 Remove temporary facilities from site when directed by Departmental Representative.

1.1 GENERAL

- .1 Use new material and equipment unless otherwise specified.
- .2 Within 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 one 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 shall be 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 ACCEPTABLE MATERIALS AND ALTERNATIVES

- .1 Acceptable Materials: When materials specified include trade names or trademarks or manufacturers or supplier's name as part of the material description, select and only use one of the names listed for incorporation into the Work.

- .2 Alternative Materials: Submission of alternative materials to trade names or manufacturer's names specified must be done during the bidding period following procedures indicated in the Instructions to Bidders.
- .3 Substitutions: After contract award, substitution of a specified material will be dealt with as a change to the Work in accordance with the General Conditions of the Contract.

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 manufacturer's 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 Ensure 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 in this regard.
- .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.
- .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. Provide same degree of protection to materials supplied by Departmental Representative.
- .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.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .6 Store sheet materials and lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
- .8 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.

1.10 CONSTRUCTION EQUIPMENT AND PLANT

- .1 On request, prove to the satisfaction of Departmental Representative that the construction equipment and plant are adequate to manufacture, transport, place and finish work to quality and production rates specified. If inadequate, replace or provide additional equipment or plant as directed.
- .2 Maintain construction equipment and plant in good operating order.

1.1 GENERAL

- .1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
- .2 Store volatile waste in covered locked 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 and occupied area in a clean, tidy condition, free from accumulations of waste material dust, dirt and debris. Clean areas on a daily basis.
- .2 Keep building entrances, corridors, stairwells and tenant occupied areas of building in a clean dust free condition at all times. Conduct thorough cleaning of these areas at end of each workshift when used by workers or affected by the Work.
- .3 Provide on-site covered, locked steel 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 daily 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 Provide dust barriers, dividers, seals on doors and employ other dust control measures as required to ensure that dust and dirt, generated by work,

are not transmitted to other existing areas of building. Should dust migrate into tenant occupied and public areas of building, employ such means as may be necessary to immediately clean all contaminated surfaces to the satisfaction of the Departmental Representative.

.1 See Section 01 50 00 for requirements on dust control and for erection of dust partitions.

- .8 Immediately clean all dust, dirt, smears, scuffs and soiled surfaces in lobbies, corridors, and within tenant occupied areas resulting from the Work.

.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.

- .9 Remove snow and ice from access doors used by workforce.

1.4 FINAL CLEANING

- .1 In preparation for acceptance of the completed work perform final cleaning.
- .2 Remove grease, dust, dirt, stains, labels, fingerprints, marks and other foreign materials, from interior and exterior finished surfaces. Clean and polish surfaces including glass, mirrors, hardware, wall tile, stainless steel, chrome, baked enamel, plastic laminate, mechanical and electrical fixtures.
- .3 Replace items with broken pieces, scratches or disfigured.
- .4 Clean lighting reflectors, lenses, and other lighting surfaces.
- .5 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
- .6 Wax, seal, shampoo or prepare floor finishes as recommended by manufacturer.
- .7 Inspect finishes, fitments and equipment. Ensure specified workmanship and operation.

- .8 Clean equipment, washroom fixtures to a sanitary condition. Replace filters of mechanical equipment.

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| <u>1.1 RELATED WORK</u> | .1 | Environment Procedures: Section 01 35 43. |
| <u>1.2 GENERAL</u> | .1 | Carry out work placing maximum emphasis on the areas of: <ul style="list-style-type: none">.1 Waste reduction;.2 Diversion of waste from landfill and;.3 Material Recycling. |
| <u>1.3 WASTE MANAGEMENT PLAN</u> | .1 | Prior to commencement of work, prepare waste Management Workplan. |
| | .2 | Workplan to include: <ul style="list-style-type: none">.1 Waste audit..2 Waste reduction practices..3 Material source separation process..4 Procedures for sending recyclables to recycling facilities..5 Procedures for sending non-salvageable items and waste to approved waste processing facility or landfill site..6 Training and supervising workforce on waste management at site. |
| | .3 | Workplan to incorporate waste management requirements specified herein and in other sections of the Specifications. |
| | .4 | Develop Workplan in collaboration with all subcontractors to ensure all waste management issues and opportunities are addressed. |
| | .5 | Submit copy of Workplan to Departmental Representative for review and approval. <ul style="list-style-type: none">.1 Make revisions to Plan as directed by Departmental Representative. |
| | .6 | Implement and manage all aspects of Waste Management Workplan for duration of work. |
| | .7 | Revise Plan as work progresses addressing new opportunities for diversion of waste from landfill. |
| <u>1.4 WASTE AUDIT</u> | .1 | At project start-up, conduct waste audit of: |

.1 Site conditions identifying salvageable and non-salvageable items and waste resulting from demolition and removal work.

.2 Projected waste resulting from product packaging and from material leftover after installation work.

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

1.5 WASTE REDUCTION

.1 Based on waste audit, develop waste reduction program.

.2 Structure program to prioritize actions, with waste reduction as first priority, followed by salvage and recycling effort, then disposal as solid waste.

.3 Identify materials and equipment to be:
.1 Protected and turned over to Departmental Representative when indicated.
.2 Salvaged for resale by Contractor.
.3 Sent to recycling facility.
.4 Sent to waste processing/landfill site for their recycling effort
.5 Disposed of in approved landfill site.

.4 Reduce construction waste during installation work. Undertake practices which will minimize waste and optimize full use of new materials on site, such as:
.1 Use of a central cutting area to allow for easy access to off-cuts;
.2 Use of off-cuts for blocking and bridging elsewhere.
.3 Use of effective and strategically placed facilities on site for storage and staging of left-over or partially cut materials (such as gypsum board, plywood, ceiling tiles, insulation etc...) to allow for easy incorporation into work whenever possible avoiding unnecessary waste.

- .5 Develop other strategies and innovative procedures to reduce waste such as minimizing the extent of packaging used for delivery of materials to site etc.

1.6 MATERIAL SOURCE
SEPARATION PROCESS

- .1 Develop and implement material source separation process at commencement of work as part of mobilization and waste management at site.
- .2 Provide on-site facilities to collect, handle and store anticipated quantities of reusable, salvageable and recyclable materials.
 - .1 Use suitable containers for individual collection of items based on intended purpose.
 - .2 Locate to facilitate deposit but without hindering daily operations of existing building tenants.
 - .3 Clearly mark containers and stockpiles as to purpose and use.
- .3 Perform demolition and removal of existing building components and equipment following a systematic deconstruction process.
 - .1 Separate materials and equipment at source, carefully dismantling, labelling and stockpiling alike items for the following purposes:
 - .1 Reinstallation into the work where indicated.
 - .2 Salvaging reusable items not needed in project which Contractor may sell to other parties. Sale of such items not permitted on site.
 - .3 Sending as many items as possible to locally available recycling facility.
 - .4 Segregating remaining waste and debris into various individual waste categories for disposal in a "non-mixed state" as recommended by waste processing/landfill sites.
- .4 Isolate product packaging and delivery containers from general waste stream. Send to recycling facility or return to

supplier/manufacturer.

- .5 Send leftover material resulting from installation work for recycling whenever possible.
- .6 Establish methods whereby hazardous and toxic waste materials, and their containers, encountered or used in the course work are properly isolated, stored on site and disposed in accordance with applicable laws and regulations from authorities having jurisdiction.
- .7 Isolate and store existing materials and equipment identified for re-incorporation into the Work. Protect against damage.

1.7 WORKER TRAINING AND SUPERVISION

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

1.8 CERTIFICATION OF MATERIAL DIVERSION

- .1 Submit to Departmental Representative, copies of certified weigh bills from authorized waste processing sites and sale receipts from recycling/reuse facilities

confirming receipt of building materials and quantity of waste diverted from landfill.

- .2 Submit data at pre-determined project milestones as determined by Departmental Representative.
- .3 Compare actual quantities diverted from landfill with projections made during waste audit.

1.9 DISPOSAL REQUIREMENTS

- .1 Burying or burning of rubbish and waste materials is prohibited.
- .2 Disposal of waste, volatile materials, mineral spirits, oil, or paint thinner 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 waste intended for landfill in separated condition, following rules and recommendations of Landfill Operator in support of their effort to divert, recycle and reduce amount of solid waste placed in landfill.
- .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.

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| <u>1.1 SECTION INCLUDES</u> | .1 | Administrative procedures preceding inspection and acceptance of Work by Departmental Representative. |
| <u>1.2 RELATED SECTIONS</u> | .1 | Section 01 78 00 - Closeout Submittals. |
| <u>1.3 INSPECTION AND DECLARATION</u> | .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.
.9 Commissioning of equipment and systems specified. |

- .4 Correct all discrepancies before Departmental Representative will issue the Certificate of Completion.

1.1 GENERAL

- .1 Submit closeout documents specified in this section prior to application for Certificate of Substantial Performance of the Work.
- .2 Submit data in sufficient lead time to allow adequate review by Departmental Representative.
- .3 Make revisions to data as directed by Departmental Representative based on review.

1.2 PROJECT RECORD DOCUMENTS

- .1 Departmental Representative will provide 2 white print copies of contract drawings specifically to record "as-built" conditions.
- .2 Maintain 1 set at site and record actual built conditions.
- .3 Mark each drawing with up-to-date, real time as-built conditions as work progresses.
- .4 Maintain drawings in good condition and make available for inspection by the Departmental Representative whenever requested.
- .5 Record changes in red ink on the prints. Mark only on 1 set of drawings and transfer data to other set at completion of project.
 - .1 Neatly transfer notations to second set also by use of red ink.
 - .2 Stamp all drawings of both sets with the notation "As-Built Drawings". Also sign and date drawings.
 - .3 Indicate all modifications, substitutions and deviations from that shown on the Contract Drawings or in Specifications.
- .6 Record following information:
 - .1 Field changes to dimensions and details;
 - .2 Any additional details produced in the course of the contract by the Departmental Representative to supplement or to change existing design drawings;
 - .3 All Change Orders issued, documenting accurately and consistently the changed condition as it applies to all affected drawing details.
- .7 Maintain As-built documents current as the contract progresses.
- .8 Submit both sets of as-builts drawings.

1.3 OPERATIONS &
MAINTENANCE DATA

- .1 Submit 2 copies of Operations and Maintenance (O&M) manual(s).
- .2 O&M manuals to be hard cover three ring binder for 215 x 280 mm size paper. Each copy shall contain:
 - .1 Technical data for installation, operations and maintenance of products and systems supplied in project.
 - .2 Nameplate information for mechanical and electrical equipment.
 - .3 List of spare parts and tools.
 - .4 Original or certified copy of warranties and manufacturer's product guarantees.
 - .5 Reports of any field test.
 - .6 Complete set of reviewed shop drawings.
- .3 Provide cover sheet in each manual with:
 - .1 Project name and number
 - .2 Name and address of Contractor and subcontractors
 - .3 Date of submission
 - .4 Table of contents
- .4 Manuals to be in English language.

1.4 TOOLS AND
PARTS

- .1 Supply special tools, wrenches and spare parts as supplied by manufacturer to disassemble, remove and reinstall components as needed for maintenance purposes.
- .2 Tag all items with name of associated equipment and function.
- .3 Turn items over to Departmental Representative immediately upon completion of work.
- .4 Where required, provide manufacturer's written instructions on intent and method of use.
- .5 Provide name, address and telephone number of nearest supplier.
- .6 Prepare and include complete inventory list of items supplied into the maintenance manuals.

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 Owner's personnel prior to date of final inspection.
- .2 Departmental Representative will provide a list of Owner's personnel to receive instructions.
- .3 Cooperate with Departmental Representative in coordinating time and attendance of Owner'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 Owner'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 2 weeks prior to designated dates, for Departmental Representative's approval.
- .2 Submit report within 1 week after completion of demonstration, that demonstration and instructions have been satisfactorily completed. Provide time and date of when each demonstration was actually given, with list of persons present.

- | | | |
|--|----|--|
| <u>1.5 CONDITIONS FOR DEMONSTRATIONS</u> | .1 | Prior to carrying out demonstration and training, ensure that equipment has been inspected and tested, is fully operational, has been performance verified and TAB has been carried out. |
| | .2 | Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions. |
| <u>1.6 PREPARATION</u> | .1 | Verify that conditions for demonstration and instructions comply with requirements. |
| | .2 | Verify that designated personnel are present. |
| <u>1.7 DEMONSTRATION AND INSTRUCTIONS</u> | .1 | Include the following items within the demonstration and training: <ul style="list-style-type: none">.1 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each of equipment..2 Instruct personnel in all phases of operation and maintenance using operation and maintenance manuals as the basis of instruction..3 Review contents of manual in detail to explain all aspects of operation and maintenance..4 Prepare and insert additional data in operations and maintenance manuals when the need for additional data becomes apparent during instructions..5 Provide other specific training and instructions as specified in trade sections. |
| <u>1.8 TIME ALLOCATED FOR INSTRUCTIONS</u> | .1 | Observe the allocated time period specified in trade sections. Provide additional time when required to ensure all personnel fully understand all aspects of the information and instructions being provided. Allow for questions by participants. |

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 PWGSC, is a planned program of activities conducted in concert with other activities performed during each stage of project delivery.
 - .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
OBJECTIVES

- .1 A Commissioning Plan has been prepared by the Design Consultant, on behalf of PWGSC, which identifies, among other issues, specific commissioning activities to be carried out by the commissioning team during the Construction and Occupancy Stages 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.
- .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 SYSTEMS TO BE
COMMISSIONED

- .1 The following systems and controls, complete with associated equipment and components, will be commissioned by the Commissioning Agent and requires related commissioning activities to be performed by Contractor as specified herein and in section(s):
 - .1 Mechanical
 - .2 Electrical
 - .3 Doors and Hardware
 - .4 Finishes

1.6 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 Ensure that 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 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.

- .4 Commissioning Agent: a specifically appointed person, representing the Departmental Representative, responsible for the development of a Commissioning Plan and managing its 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 PWGSC to prepare the final design and contract documents for this Work. His name is: .
 - .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 PWGSC 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.
- .8 Design Consultant: persons from the, 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.
- .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.
- .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.

1.7 COMMISSIONING TEAM

.1 A commissioning team will be assembled to carryout various functions needed to effectively commission the Facility. Contractor shall be 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:

- .1 Commissioning Agent
- .2 Design Consultant
- .3 Contractor
- .4 Construction Commissioning Supervisor
- .5 Departmental Representative
- .6 PWGSC Commissioning Manager
- .7 PWGSC departmental personnel providing advice and project quality control to Departmental representative when required.

.8 Facility's operation and maintenance personnel staff as identified by Departmental Representative.

.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.

.4 Construction Commissioning Supervisor:

.1 Assign a person, under Contractor's employ, to be the Construction Commissioning Supervisor.

.2 Person to be knowledgeable and have past experience in commissioning of mechanical and electrical systems. Submit affidavit confirmation person's qualifications for Departmental Representative's review and approval.

.3 Construction Commissioning Supervisor to coordinate and oversee all work activities and input required from subcontractors and applicable trades as required to make equipment, subsystems and system ready for commissioning and to conduct commissioning duties assigned to the Contractor.

.4 Construction Commissioning Supervisor shall:

.1 Be the main point of contact, representing the Contractor, with whom the Commissioning Agent and Departmental Representative will to deal with in matters relating to commissioning.

.2 Attend all commissioning meetings and ensure that appropriate persons from subcontractors, trades, suppliers and manufacturers attend meetings when deemed required by Commissioning Agent or Departmental Representative.

1.8 CONTRACTOR'S
COMMISSIONING
ACTIVITIES

.1 General:

.1 Organize and arrange for the services of subcontractors, their specialists and manufacturer's technical representatives to perform Contractor's commissioning activities

.2 Ensure that 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 in clause 1.11.

.4 Notify Departmental Representative in writing when Facility is ready for be commissioned. Give 14 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 Completion will only be issued when:

.1 All commissioning documentation has been received and found suitable by Departmental Representative;

.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 in clause 1.13 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 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.

.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 architectural building component, mechanical and 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.).
 - .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 in clause 1.12 below.
 - .2 Turn over any filled-in checks sheets or reports resulting from commissioning.
- .5 During Warranty period at Occupancy Stage:

- .1 After 10 months has elapsed from the commencement of the warranty period, conduct commissioning checks on the building components and systems.
- .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.
 - .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.

1.9 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, PWGSC 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.
 - .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.

1.10 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.

1.11 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.

1.12 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 as specified.
- .4 Carryout training in accordance with requirements of section 01 79 00.
- .5 Submit written agenda of training session(s) 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 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.

1.13 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 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 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.