

ARCHITECTURE SPECIFICATIONS FOR TENDER

Canadian Space Agency

6767, route de l'Aéroport
Saint-Hubert (Québec) J3Y 8Y9

V/Réf : n/a
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Generator Replacement
John H. Chapman Space Center

CIMAISE

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**1.
Cooperation and coordination
with other trades**

- .1 Ensure the entire cooperation of all trades, without exception, pertaining to these works, for the furniture and the installation of all components necessary for the execution of this work.
- .2 Unless stated otherwise, the manufacturer must provide all necessary accessories to complete, on the spot, the installation of the components he fabricated.
- .3 The installation is the responsibility of the Contractor. He will provide materials, workmanship and equipment required to complete the installation of his work.

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| 2.
Openings and repairs | <p>.1 In principle, unless stated otherwise on the drawings and on Ministerial representative tender, all openings and piercing to be done, being over 150mm in diameter or more than 195 square centimeters, for the needs of different trades in the existing building and in new concrete slabs, will be done by the Contractor, after approval of Ministerial representative.</p> <p>.2 The Contractor will do the repairs afterwards, as soon as subcontractor's work is done and that they have the certificates for tests, inspection and approval done by laboratories, inspectors and Ministerial representative.</p> <p>.3 It is the responsibility of the Contractor to ensure the cooperation and the coordination of all subcontractors to anticipate, as much as possible before beginning of the work, the openings, location for fastening devices, necessary space for various components, etc. To this effect, refer to the beginning of each division for general clauses, proper to each trade.</p> |
| 3.
Site limits | <p>.1 The Contractor will respect the site limits established while respecting the required conditions stated on the drawings, in the tender and by other requirements by Ministerial representative.</p> |
| 4.
Existing services | <p>.1 When connecting work has to be done to existing networks, the work has to be performed at times fixed by responsible authority, not to bother the activities of users.</p> |
| 5.
Other drawings | <p>.1 The Ministerial representative can, for clarification purposes only, give to the Contractor extra drawings to ensure the good execution of the works. These drawings will have the same signification and the same range as if they were part of the contract documents.</p> |
| 6.
Site meetings | <p>.1 The Ministerial representative will organize some project meetings when necessary. He will state the time and write a progress report then distribute it.</p> |
| 7.
Equipments | <p>.1 In their tender, the Contractor and subcontractors will take into account the installation costs for existing equipment and equipment provided by the Ministerial representative as stated in architectural, mechanical/electrical tender.</p> |
| 8.
Site preparation | <p>.1 At the beginning and during work, prepare premises in advance and in relation with the work to be done.</p> <p>.2 Anticipate the arrival of materials and equipment so as not to block or even reduce access ways during heavy traffic. Release and transport out of the site any residue resulting from construction work and demolition. As much as possible, deliver materials immediately before needed or for before installation, therefore not cluttering unnecessarily access to the buildings.</p> <p>.3 In entrances and other places, remove all clutter to allow easy access where work must be done. Free entrances and build the required protections to allow users to pass in security, at all times.</p> <p>.4 Plan, coordinate and prepare the work for each operations so there is no loss of time or delays due to the lack of foresight, of rules and regulations, of harmful overlapping of certain works, of useless clutter and hard access, basic work and incomplete</p> |

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- preparation, or defective electricity, water and other inadequate supply services and of all other unfavorable similar causes or conditions.
- .5 Before starting any work, coordinate and determine, with each subcontractor, the spaces required for doing the work.
- 9. Site conditions**
- .1 Work must be planned and done to minimize all inconvenient such as interferences, troubles, noise, dust, gas for combustible motors and other nuisances. Work areas must be zoned and when required by the Ministerial representative, adequate temporary protections must be installed to confine construction spaces where necessary; (according to the requirements of the Ministerial representative).
- 10. Public, workers and occupants protection.**
- .1 According to the regulation of Health and Work Security Board, the Contractor is the project manager.
- .2 Build and maintain in good order, fences, partitions, wire netting, covered bridges and any other means for temporary protection appropriate for surrounding the building, around openings and scaffoldings and also in other dangerous areas around the building and on the ground.
- .3 Provide, install and maintain in operation, during darkness periods, fires or guard lights in areas where there are ramps, clutter, open passages, dangerous objects or equipment and in any other area of this nature around the building and on the ground.
- .4 Protective gears must be as per Workmen Health and Safety Code.
- .5 The Ministerial representative will have the right, without prior formal demand, to provide, at the expense of the contractor, safety measures that the Contractor has omitted to take, either for the maintenance of communications or for the protection of public or company's workers.
- .6 It is the responsibility of the Contractor to build and maintain in place signs, barricades and required fences to ensure safety of occupants having to circulate on the site. However, this work has to be coordinated with the security service of the Ministerial representative and municipal authorities.
- .7 The prevention program of the Contractor, proper to the site, must be coordinated to the prevention program of the Ministerial representative.
- 11. Access to work on site**
- .1 The Contractor is responsible for any damage caused on the site or out of the site area where work is being done with heavy machinery and demolition of construction materials. The route taken by vehicles must be approved by competent authorities.
- .2 Access must be made to ensure safety of public and of workers in areas where work is being done, as much for municipal, ambulance, police and firemen services.
- 12. Traffic blocking**
- .1 The Contractor has to comply with the prescribed measures and precautions stated by the Ministerial representative concerning tools, installations and work on the site and must not hinder traffic and not be the cause for accident.
- .2 Actual services to buildings for taxis, suppliers, fire and security services, resupplying for cafeterias, postal services, and garbage removal must stay in operation at all times; the Contractor will coordinate his work and deliveries to the site so as not to hinder or affect normal functioning of services stated above.

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| 13.
Storage areas and parking | <ul style="list-style-type: none">.1 In principle, no massive storage will be authorized on the site, except for limited spaces well defined by the Ministerial representative, to store certain materials in large enough quantity to continue the work and ensure its continuity..2 Parking spaces for the Contractor and his subcontractors will be allowed only inside the limited area selected by the Ministerial representative. The Contractor must take into consideration that there are very few parking areas available on the site..3 Parking on the premise, elsewhere of inside prescribed limits is forbidden and any vehicle found will be towed at his own expense and be liable for a fine. |
| 14.
Site offices | <ul style="list-style-type: none">.1 The Contractor will not have any room outside of work area..2 Site meetings will be held in an office supplied by Ministerial representative. |
| 15.
Protection of materials | <ul style="list-style-type: none">.1 During storage period, protect against damage all materials and manufactured products delivered to the site..2 Protect materials and manufactured products according to printed instruction from manufacturer. |
| 16.
Protection of work in place
and of the site. | <ul style="list-style-type: none">.1 With a tarp, protect plywood or other types of appropriated material, all existing walls and other works located nearby and near ramps, ladders and other temporary means of transport and circulation..2 During bad weather, protect work being done or finished against any deterioration by means of temporary shelter and other appropriate means. Also protect against humidity and water all work susceptible to be damaged by the weather..3 Cover with a plywood sheet all finished surfaces that must be protected to allow for work to continue..4 Protect all equipment that is entrusted to the Contractor. |
| 17.
Protection of existing
structures | <ul style="list-style-type: none">.1 The Contractor must, at his own expense, protect, support, hold, re-route and re-establish to good order, all water ducts, building gas conducts, energy, telephone or other structures met, disturbed or damaged in the course of the work, and all this, to the satisfaction of interested parties..2 Before beginning demolition work, the contractor must communicate with authorities of concerned services to locate existing ducts. Otherwise, the Contractor will be held responsible for damages caused to ducts, structures and other components like finishing, etc. |
| 18.
Removal of temporary works | <ul style="list-style-type: none">.1 As work progresses, remove scaffoldings, ramps, footbridges, ladders and other temporary work of same nature that are no longer required..2 At the end of the work, remove equipments, accessories, materials, networks etc, coming from temporary works. Leave grounds free of all residue material or surplus. |

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| 19.
Temporary source for supplies | <ul style="list-style-type: none">.1 The Contractor will be able to use existing services for water, electricity, heating and any other source of energy necessary for the duration of the construction of expansion work, for his operation purpose and the ones for the subcontractors..2 Note that existing services are located near the main building. The Contractor must provide the necessary facilities near the site and protect the path traveled from the point of connection..3 Any damage done to the work due to inadequate functioning of temporary mechanical and electrical services must be repaired without additional cost to the Ministerial representative..4 Temporary services must comply with the laws and regulations pertaining to accident prevention of the Quebec Workmen Health and Safety Code..5 Temporary services must be maintained in operation until provisory acceptance of permanent designed areas. |
| 20.
General repairs | <ul style="list-style-type: none">.1 Repair or replace all material or other accessories that could have been damaged by any situation out of control of the manufacturer or concerned trade..2 Before each final acceptance by the Ministerial representative, the Contractor must proceed to repair all surfaces that could have been damaged by Contractor or his subcontractors while doing their work. |
| 21.
Licenses and authorization | <ul style="list-style-type: none">.1 It is the responsibility of the Contractor to obtain from municipal and government authorities, all pertinent information concerning laws and regulations in force concerning construction work in the province and the town where work will be done. He must also inquire about the execution contingencies specific to the areas..2 No building permit is required for this construction. |
| 22.
Toilets | <ul style="list-style-type: none">.1 The Contractor will have the possibility to use toilets and services of the building. Only the identified room may be used. The contractor has the responsibility to clean the room on a daily basis. |
| 23.
Garbage containers | <ul style="list-style-type: none">.1 Cost of transportation and dumpsite will be paid by Contractor. |
| 24.
Approval of shop drawings | <ul style="list-style-type: none">.1 All shop drawings must be checked by Ministerial representative before making a product, equipment, etc..2 All products, equipment etc., stated in the shop drawings and that were not approved by Ministerial representative before their shipping, will be automatically rejected. |
| 25.
Building codes in force | <ul style="list-style-type: none">.1 Canadian Building Code and all other codes and regulations in force. |

- 26. Supervision and coordination : Responsibility of the Contractor**
- .1 The Contractor must coordinate himself all the works of different trades.
 - .2 The Contractor must keep an eye on all subcontractor works and make sure that the work is done according to specifications. The presence of a superintendent or responsible for the coordination is required during the construction period.
 - .3 Before sending Ministerial representative a requirement for definite approval, the Contractor must check all the lists of deficiencies given by the Ministerial representative after their inspection. He must verify himself that each item listed has been corrected.
- 27. Protection of finishing components and other works**
- .1 The Contractor has the responsibility to protect against all damage, all components that must be used in the building construction, mainly decoration and finishing accessories. Damaged components will be refused and must be replaced.
- 28. Works done by others**
- .1 In the drawings and tender, the mention "by other divisions" or "by other sections" implies that these works are concerning the Contractor, either for another section or for another division of the tender.
- When works are not part of the contract, the mention "apart from contract" appears specifically.
- The Contractor must consult in detail all architectural, structural, mechanical and electrical drawings and tender to be able to include, in his contract, all the works designed by the mention "by other divisions", "by the Contractor" or any other similar term.
- Some of these works could already have been included in other sections of the tender or other drawings. It is the responsibility of the Contractor to consult all documents so he can itemize the ones being already under someone else's specific section of the tender or again, illustrated on the drawings of other specific trades or field. The ones that are not specifically described or itemized on the drawings or tender of other divisions will be the responsibility of the Contractor.
- 29. Abbreviations**
- .1 Words, sentences and abbreviations with well-known technical meaning will have the same meaning in this document, including:
 - c/w: complete with, including
 - c/c: centre to centre
 - min.: minimum
 - max.: maximum
 - m: metre
 - mm: millimetre
 - ' or ft: feet
 - " or in: inch
 - m²: square metre
 - mm²: square millimetre
 - ft²: square foot
 - in²: square inch
 - Ø : diameter
 - NPS: nominal pipe size
 - °F: degree Fahrenheit
 - °C: degree Celsius

- rpm: revolution per minute
- db: decibel
- e.g.: for example
- hr: hour
- amp. Or A: ampere
- HZ (Hz): hertz
- V: volt
- kW: kilowatt
- HP: horse-power
- kVA: kilovolt-ampere
- f: connecting wire
- ph: Phase
- EMT: electrical metallic tubing, thin walled
- PVC: polyvinyl chloride conduit
- C: conduit
- std: standard
- H.C.: off contract
- CSA/(ACNOR): Canadian Standard Association
- ULC: Underwriter's Laboratories of Canada
- CEC: Canadian Electrical Code

30. Codes & Standards

- .1 Works must comply with the following requirements (most recent applicable editions):
 - Standards of the Canadian General Standards Board (CGSB).
 - Standards of the Canadian Standards Association (CSA).
 - Quebec Construction Code.
 - Quebec Electrical Code.
 - Hydro-Québec standards.
- .2 Requirements specified on plans and specifications should never be lowered under the pretext that provincial and local regulations or standards and codes mentioned above are less strict. In all cases, the most stringent standards and codes shall prevail.

31. Paraseismic Measures

- .1 Responsibility:
 - .1 The Electrical contractor is responsible for seismic measures related to his trade.
 - .2 The design of seismic devices and systems must be done by a company specialized in seismic protection and recognized in the province of Quebec.
 - .3 Fees for this specialist must be included in the bid price of the contractor.
 - .4 The electrical contractor must include in his bid the supply and installation of all seismic protective devices.
 - .5 The electrical contractor must coordinate the type of installation of his electrical equipment (recessed, surface, floor or wall mounted, etc.) with seismic measures specialist that he will retain within the project. To this effect, this specialized firm must recommend in writing to the contractor, the devices and measures to instate in order to have the installation of the electrical equipment comply with the applicable standards. A copy of the report must be remitted to the project Departmental Representative. The specialized seismic measures firm must submit all calculation criteria used in

conjunction with paraseismic measures to be used. This document must also include all technical bulletins, diagrams and installation drawings of the paraseismic anchoring methods required by the electrical equipment installed inside this project.

.6 The electrical contractor must install all devices and implement all measures described in the report issued by seismic measures specialist. Once these measures and devices implemented, the electrical contractor must have his electrical installations verified by the seismic measures specialist who must certify that the electrical contractor conforms to the measures described in the specialist's report.

.7 Where appropriate, the electrical contractor shall make required adjustments and take corrective actions according to the written report presented by the seismic protection specialist.

.2 Codes and standards in effect:

.1 SMACNA 1138, "Seismic Restraint Manual Guidelines for Mechanical Systems";

.2 Addendum no.1 to Seismic Restraint Manual Guidelines for Mechanical Systems;

.3 ASTM E-488;

.4 Quebec building code, latest edition.

32. Acoustical Treatment

.1 The Contractor is responsible for acoustic sealing around conduits and other technical equipment running through walls.

.2 The Contractor is responsible for ensuring that the electrical equipment causes no sound or vibration which may disrupt normal activities of the building. If deficiencies are noticed, the Contractor must take, at his own expense, required corrective actions so that the facility is acceptable. The Contractor must obtain Ministerial Representative approval.

33. Equipment Installation

.1 Locations of equipment and fittings are indicated approximately on drawings. The exact location will be determined on site and approved, if required, by the Departmental Representative.

.2 Size and appearance of electrical equipment shown on drawings are approximate. Overall dimensions of electrical equipment must be approved by the Departmental Representative. Technical specifications and overall dimensions of equipment must be included in operating and maintenance manuals upon completion of work.

.3 The Electrical contractor must install electrical, equipment and fittings as to minimize overall dimensions and to maximize peripheral clearance.

.4 The Electrical contractor should refer to the manufacturer's recommendations to perform installation in accordance with requirements and notify in writing the Departmental Representative if discrepancies are noted between manufacturer's recommendations and requirements of contract documents. Final connections must be carried as directed by Departmental Representative.

34. Diagrams

.1 Operation sequence for control of main electrical and electromechanical systems is illustrated on diagrams shown on drawings. Detailed diagrams for wiring and connection, according to technical instructions by suppliers of system components, must be submitted to the Departmental Representative for approval. These diagrams must be included in operating and maintenance manuals supplied upon completion of work.

35. Identification

.1 General

.1 All identifications must be made in French and English in accordance the

Project Manager's directives. Before doing the work, the Electrical contractor must ask the Departmental Representative to verify and approve the list of identifications.

.2 Equipment identification

.1 The Electrical Subcontractor must identify with nameplates (glued and screwed lamicoid plates) all electric equipment to be identified in part 3 of the corresponding section.

.2 Prior to inscription, three (3) copies of the list of identifications must be submitted to Departmental Representative for verification.

.3 Plate dimensions must correspond to dimensions given in the table below:

Format 1	9.53 mm x 50 mm	1 line	Letters of 3 mm high
Format 2	12 mm x 68 mm	1 line	Letters of 4.76 mm high
Format 3	12 mm x 68 mm	2 lines	Letters of 3 mm high
Format 4	18 mm x 87 mm	1 line	Letters of 7.94 mm high
Format 5	18 mm x 87 mm	2 lines	Letters of 4.76 mm high
Format 6	25 mm x 100 mm	1 line	Letters of 12 mm high
Format 7	25 mm x 100 mm	2 lines	Letters of 6 mm high

.4 Identification plates for equipment connected on the emergency must be of red colour.

.3 Identification of cables and conduits

.1 Cables and conduits must be identified with colour markers (plastic ribbons) at intervals of 15 m and wherever they enter in or emerge from a wall, a ceiling or a floor.

.2 The base colour band shall be 25 mm wide and the complementary colour band must be 19 mm wide.

.3 Colour for markers must be according to the table below:

Cables	Base colour	Complementary colour
Up to 250 volts	yellow	
Up to 600 volts	yellow	green
Up to 15 kV	yellow	blue
Up to 25 kV	yellow	red
Telephone	green	
Other communication network, general call, etc.	green	blue
Fire alarm	red	
Emergency communication	red	blue
Other auxiliary and security networks	red	yellow

An additional marker must be installed in front of the other ones when the load is connected to the "normal/emergency" or "UPS" networks.

.4 Conductor identification

.1 All feeder, branch and control circuit conductors must be numbered at each end and within boxes, using Thomas & Betts indicators.

.5 Colour code

.1 Colour code used for conductors must be in accordance with C.22.10

CSA standard (latest edition). This code must be respected for the entire installation.

- .2 .2 Use a colour code for communication cables wires and match colours for the entire network.

.6 Nameplates

- .1 Manufacturer nameplates and CSA labels must be clearly visible and legible after installation of equipment.

36.

Tests & Start-Up

.1 Tests – General

- .1 The Electrical contractor shall provide all materials and labour required to perform tests, including costs incurred by the independent laboratory and manufacturers.
- .2 The Electrical contractor must ensure that tests are not destructive for equipment and, if necessary, disconnect or isolate certain components.
- .3 The Electrical contractor must notify the Departmental Representative 48 hours before testing day. The Departmental Representative will confirm his presence to the Electrical contractor if the Departmental Representative wants to assist to tests.
- .4 In the event that tests indicate deficiencies regarding expected results, the Electrical contractor must, at his own expense, perform required verifications and take the necessary corrective actions, including replacing defective or inadequate components. A new series of tests shall be performed and results transmitted to the Departmental Representative before start-up of equipment and systems.
- .5 The Electrical contractor must submit to the Departmental Representative all reports indicating equipment tested, type of testing, methodology and results. All reports must be typed, dated, signed and submitted in three (3) copies.
- .6 Some tests must be performed by a recognized independent laboratory (L), the Electrical contractor (E) or the manufacturer (M). Some of those tests are as follows:

Description	Tests to be done	Tests done by
Medium voltage equipment and cable test		
Low voltage equipment test	X	E
Coordination study	X	E
Grounding test		
Dielectric test (low voltage)		
Generator test	X	E
UPS test		
Fire alarm system test	X	E
Fuel solenoid valve test	X	E
Exterior connection system test	X	E
Lighting control system test		

Camera test		
Intrusion alarm test		
Arc flash tests		

.2 Low voltage equipment test

- .1 Check all circuits and ensure they are free of short-circuit and ground fault.
- .2 Check all connections and make sure they are done properly.
- .3 Check the polarity of outlets and correct as required.

.3 Start-up

- .1 The Electrical contractor must perform or have performed, before start-up of equipment and systems, tests described above as well as those described in specifications or asked for on plans and ensure that the results comply with requirements and have been verified by the Departmental Representative.

.4 Coordination study

- .1 The contractor must include in his tender the coordination study regarding the following elements:
 - Selective coordination between the generator set breaker and the feeder breakers in panel (3) 6-01-D3H1;
 - Selective coordination between the exterior connection breaker and the feed breakers in panel (3) 6-01-D3H1;
 - Coordination of the ground fault trip units in order that under a fault condition the breaker the furthest downstream open on this ground fault.

.5 Solenoid valve

- .1 Once the control panel solenoid valve is connected, verify that it functions properly when testing the generator set.

.6 Outside connection system

- .1 After replacing the motorized operator, verify that the following operating options function properly:
 - Main generator set;
 - Mobil generator set;
 - Load bank

Submit a dated and signed report indicating the tests done and the results.

.7 Fire alarm

- .1 After the connection of the new modules to the existing indicating circuit loops as per CAN/ULC S524, program the system in order that the alert messages are shown on the display panel. Check the proper operation of each of the supervisory elements as per CAN/ULC S536

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PART 1 – GENERAL**1.1****Work covered by contract documents**

The project consists primarily of replacing the existing unserviceable generator in Mechanical Room 6B-101 at the John H. Chapman Space Center. A temporary generator is installed while replacement is in progress. It will be important to avoid construction delays and ensure proper coordination of work scheduling. Without limiting the scope of the project, the following is currently planned:

1. Replacement and upgrade of entire unit, exhaust system, ventilation, control, plumbing and modification of the existing sprinkler system.
2. Dismantling and reinstallation of existing blinds and motorized shutters.
3. Excavation work for the installation of new electromechanical services on the existing network.
4. Electrical work related to the generator.
5. Insulation and waterproofing work.
6. Construction: A containment basin shall be built at the perimeter of the existing pump and auxiliary tanks.
7. Concreting and epoxy flooring.
8. Metalworking.

In addition, to ensure the integrity of existing fire separations, to ensure fireproofing and to ensure the emanation of the fire separation that divides the mechanical room from the office sector, the related work consists of:

1. Ragger existing fire protection of the room;
2. Concrete block masonry work inside;
3. Replacement of a door, frame and hardware assembly in the fire separation;
4. Painting work;

Plan the following steps to meet the prescribed schedule:

1. Site Preparation;
2. Processing of generator and control shop drawing;
3. Installation of temporary protections and temporary installations;
4. Demolition, construction and refurbishment work prescribed in the plans and specifications;
5. All minor work necessary to complete the work without defect;
6. Coordinate work logistics based on scheduling.

* Refer to the plans and specifications to know the full scope of the work

1.2
Work scheduling**Unless otherwise indicated,**

- .1 Scheduling, see section 01 32 18E and Ministerial representative's instructions. The work site is inside the occupied building. The area bounded by the site will be fully available to the contractor
- .2 Since the site is still in operation, services will remain active at all times and free lanes for local traffic.
- .3 Steps to foresee (list not exhaustive):
 - .1 Overall coordination and detailed.
 - .2 Submission of detailed work schedule for approval.
 - .3 Delivery schedule for submission of shop drawings, data sheets and samples for approval.
 - .4 Manufacturing according to documents reviewed and approved.
 - .5 Mobilization on the site according to the approved schedule.
 - .6 Install temporary services.
 - .7 Delivery of products and materials according to the approved schedule.
 - .8 Demolition / construction on the site according to the approved schedule.
 - .9 Equipment and systems testing.
 - .10 Detailed inspection work by the Contractor and correction of all apparent defects before notifying the designated professionals in writing of completion.
 - .11 Correction of defects identified by the Ministerial representative and / or professional and other competent authorities, within the time required.
 - .12 Decommissioning, compliance certificates and documents management.
- .4 Work will be performed in accordance with the requirements listed in other sections and to comply with the deadline imposed.
- .5 Always maintain access for the fight against fire; also maintain the means to fight against fire.

1.3
Site use by contractor

- .1 **Except if otherwise notified**, use of site by Contractor is restricted to work, storage and access area.
- .2 Site use must be coordinated with Ministerial representative's instructions.
- .3 Find extra work or storage area required for completion of work included in contract. Contractor must pay all costs related to these areas.

**1.4
Site occupancy by Ministerial
representative**

- .1 The Ministerial Representative will occupy the premises covered by the work, even during the work site. The premises must be free and secure during the day to allow normal operations.
- .2 Traffic shall be maintained for emergency evacuation compliance.
- .3 The premises shall be cleaned at each shift.

PART 2 – PRODUCTS**2.1
Not applicable**

- .1 Not applicable.

PART 3 – EXECUTION**3.1
Not applicable**

- .1 Not applicable.

***** END *****

1. Construction period

Unless otherwise indicated in the specifications, work must be completed as per deadlines stipulated in the contractual documents. The Ministerial Representative sets milestones according to the following deliverables:

Deliverables:

- Granting of contract.....
- Off-site preparation, documents and materials order 8 weeks
- Preparation and approval of generator's technical drawings following granting of contract 3 weeks
- Generator delivery time 16 to 20 weeks
- Demolition and cleaning of the existing network 2 weeks
- Construction and services setup 4 weeks
- Finishing and services activation 2 weeks
- End of work (including correction of any remaining deficiencies)..... 2 week

Material shall be ordered in time and all necessary labour shall be planned to comply with above contractual schedule.

2. Required schedules

- .1 Schedules to be submitted:
 - .1 Execution schedule
 - .2 Workshop drawing and technical data sheet submission schedule
 - .3 Samples submission schedule
 - .4 Product order and delivery schedule

3. Presentation

- .1 Schedules must be presented in one horizontal bar diagram.
- .2 One separate bar must be assigned for each operation or trade.
- .3 Time must be represented as a horizontal linear scale indicating first business day of each working week.
- .4 Lists presentation: as per specification's table of content
- .5 Lists content designation: as per subjects of each specification sections.

4. Submission schedule

- .1 If need be, submit first schedules within **10 days** following contract attribution.
- .2 Submit one copy for Ministerial representative and one copy per consultant.
- .3 Ministerial representative must verify proposed schedule et hand back one revised copy within 5 days after its reception.
- .4 Schedule's final version must be submitted with no delay after reception of the revised copy.
- .5 Each payment request must be accompanied of a revised version of the execution schedule.
- .6 One copy of the revised execution schedule must be sent to:
 - .1 Site office

5. Execution schedule

- .2 Subcontractors
- .3 Other interested parties
- .7 Ask addressees to inform Contractor, within a delay of **10 days**, of every issue which could be caused by the proposed execution schedule.
- .1 Present construction activities' complete schedule.
- .2 Give dates of beginning and end of each of the major activities including those listed below. The critical path shall be identified clearly from the development of the first schedule.
 - 1. Materials order and delivery
 - 2. Mobilization and site preparation
 - 3. Demolition and temporary protection
 - 4. Structure and supports assembly
 - 5. Envelope and waterproofing
 - 6. Mechanical and electrical services
 - 7. Masonry work
 - 8. Metalwork
 - 9. Fireproofing and sealing
 - 10. Door frame and hardware kit
 - 11. Interior Finish
 - 12. Site repair
 - 13. Preparation of end of project documents and provisional acceptance visit
 - 14. Correction of any remaining deficiencies
 - 15. Final visit and reception
- .3 Planned progression's percentages on first day of each week must be given for each activity.
- .4 Progression's percentage of each activity must be given on schedule submission date.
- .5 Changes that occurred since last schedule submission must be indicated.
 - .1 Main changes to come
 - .2 Modified activities since last schedule
 - .3 Progression rhythm and work completion date revised forecast.
 - .4 Other predictable changes
- .6 Detailed report on following subjects must be produced:
 - .1 Issues, predictable delay and their impact over schedule.
 - .2 Proposed corrective measures and intended results.
 - .3 Modifications' probable effect on other Contractor's schedule.

***** END *****

**1.
Requirements**

1. Shop drawings and product descriptions
2. Samples
3. Operation and maintenance manuals
4. Drawings to be inserted in file project
5. Certificates and copies

**2.
Administrative tasks**

1. Submit to Ministerial representative for verification purposes all required documents and samples in a reasonable delay and following appropriate order so works are not delayed. Lateness does not constitute a valid reason for asking for a prolongation of the contractual period. No requirements to this effect will be accepted.
2. Works stated in documents or samples to be submitted must not be started before all of them are confirmed.
3. Check all dimensions taken on site and make sure that works pertaining to adjacent works, being subjected to approval, are coordinated.
4. On site, keep an approved copy of documents and samples to be submitted.

**3.
Shop drawings**

1. The expression "shop drawings" indicate drawings, diagrams, illustrations, productivity or performance graphic charts, brochures and other documentation that the Contractor must provide to show in detail part of the work targeted.
2. Shop drawings must indicate materials to be used and construction methods. Also they must show fixation or anchorages to be used. They must have mounting diagrams, explanatory notes and any other pertinent information needed to do the work. When some components or adjacent works are prescribed related to work to be done, make sure they are well coordinated in tender, no matter which section of adjacent works are provided or installed.
3. Description. Shop drawings must:
 - 3.1 Indicate the date, the name of subcontractor and details, number of pages and their numbering.
 - 3.2 When asked for, as per certain standards, please indicate.
 - 3.3 Describe all abbreviations or symbols.
 - 3.4 Leave a free space of 60mm x 100mm for stamping and remarks by Ministerial representative.
 - 3.5 Must be very readable: fax will be refused.
 - 3.6 Must contain only information pertinent to the project.
4. Modification to the shop drawings by the Ministerial representative should not increase price of contract. Should it increase the price, please notify to Ministerial representative, in writing before starting works.
5. Make changes to shop drawings requested by the Ministerial representative, as per requirements of contractual documents. When re-submitting, notify the Ministerial representative in writing of all changes made other than the ones required by him.
6. Unless stated otherwise, submit shop drawings in PDF format by e-mail.

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7. Allow ten (10) working days to leave time to the Ministerial representative to check submitted documents.
 8. When shop drawings are verified by the Ministerial representative and no errors or omission have been found or that there are only minors corrections to be made, the copies will be returned and manufacturing and installation can start. If shop drawings are rejected, the annotated copies will be returned and new corrected shop drawings should be submitted as per mentioned indications, before manufacturing or installation can start.
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4. **Identification sheets**
 1. Contractor must keep one (1) copy on the site and three (3) other copies will be inserted in operation and maintenance manuals.
 5. **Samples**
 1. Submit samples for verification purposes as per requirements of various sections of tender. Label samples, stating their origin and proposed use in performing the works.
 2. Notify the Ministerial representative in writing, of all differences in samples in regard to requirements in contractual documents.
 3. Modifications made to samples by the Ministerial representative should not increase price of contract. Should it happened, please notify the Ministerial representative, in writing, before starting works.
 4. Make changes to samples that could be requisite by Ministerial representative as per requirements of contractual documents.
 5. When required, build work samples in an area approved by the Ministerial representative. For these works, coordinate with the Ministerial representative in order to approve the samples on site.
 6. **Drawings to be inserted in file project**
 1. After contract is awarded, in lieu of drawings to be inserted in the project file, note with care and precision all disparities in regard to contractual documents that are cause by state of premises and changes to be done.
 2. Mark placement of concealed components in mechanical and electrical installations.
 3. Identify drawings as being "drawing as built, copies for project file", maintain them as new and make sure they are available on site, so the Ministerial representative can validate them.
 4. Once works are done and before final inspection, submit to the Ministerial representative all documents inserted in project file.
 7. **Certificates and copies**
 1. Immediately after contract is awarded, submit required certificates to responsible organism for Workmen's Health and Security Welfare, proper construction licenses and copies of insurance policies. All documents must be submitted in three (3) copies to the Ministerial representative.

***** END *****

Part 1 General**1.1 REFERENCES**

- .1 Canada Labour Code - Part II, Canadian Occupational Safety and Health Regulations.
- .2 Canadian Standards Association (CSA)
- .3 Workplace Hazardous Materials Information System (WHMIS)
- .4 Act Respecting Occupational Health and Safety, R.S.Q. Chapter S-2.1.
- .5 Construction Safety Code, S-2.1, r.6.

1.2 SUBMITTALS

- .1 Submit to Ministerial Representative, the site-specific safety program, as outlined in 1.8 at least 10 days prior to start of work. The Contractor must review his program during the course of the project if any change occurs in work methods or site conditions. The Ministerial Representative may, after receiving the program or at any time during the project, ask the Contractor to update or modify the program in order to better reflect the reality of the construction site and activities. The Contractor must make the required changes before work begins.
- .2 Submit to Ministerial Representative the site inspection sheet, duly completed, at the intervals indicated in 1.13.1.
- .3 Submit to Ministerial Representative within 24 hours a copy of any inspection report, correction notice or recommendation issued by federal or provincial inspectors.
- .4 Submit to Ministerial Representative within 24 hours an investigation report for any accident involving injury and any incident exposing a potential hazard.
- .5 Submit to Ministerial Representative all safety data sheets for hazardous material to be used at the site at least three days before they are to be used.
- .6 Submit to Ministerial Representative copies of all training certificates required for application of the safety program, in particular:
 - .1 General construction site safety and health courses;
 - .2 Safety officer attestations, if applicable;
 - .3 First aid in the workplace and cardiopulmonary resuscitation;
 - .4 Work likely to release asbestos dust;
 - .5 Work in confined spaces;
 - .6 Lockout procedures;
 - .7 Safe work procedures at height;
 - .8 Hot work procedures;
 - .9 Wearing and fitting of individual protective gear;
 - .10 Forklift truck safe driving practices;
 - .11 Positioning platform;
 - .12 Any other requirement of Regulations or the safety program.

- .7 Medical examinations : Wherever legislation, regulations, directives, specification or a safety program require medical examinations, Contractor must:
 - .1 Prior to start-up, submit to Ministerial Representative certificates of medical examination for all concerned supervisory staff and employees who will be on duty when the site opens.
 - .2 Thereafter, submit without delay certificates of medical examination for any newly hired concerned personnel as and when they start work at the site.
- .8 Emergency plan : The emergency plan, as defined in 1.8.3, shall be submitted to Ministerial Representative at the same time as the site-specific safety program.
- .9 Notice of site opening : Notice of site opening shall be submitted to the *Commission de la santé et de la sécurité du travail* before work begins . A copy of such notice shall be submitted to Ministerial Representative at the same time and another posted in full view at the site. During demobilization, a notice of site closing shall be submitted to the CSST, with copy to Ministerial Representative.
- .10 Plans and certificates of compliance : Submit to the CSST and to Ministerial Representative a copy signed and sealed by engineer of all plans and certificates of compliance required pursuant to the Construction Safety Code (S-2.1, r. 6), or by any other legislation or regulation or by any other clause in the specifications or in this contract. Copies of these documents must be on hand at the site at all times.
- .11 Certificate of compliance delivered by the CSST: The certificate of compliance is a document delivered by the CSST confirming that the contractor is in rule with the CSST, i.e. that he had pay out all the benefits concerning this contract. This document must be delivered to Ministerial Representative at the end of the work.

1.3 HAZARDS ASSESSMENT

- .1 The contractor must identify all hazards inherent in each task to be carried out at the site.
- .2 The contractor must plan and organize work so as to eliminate hazards at source or promote mutual protection so that reliance on individual protective gear can be kept to a minimum. Where individual protection against falling is required, workers shall use safety harness that meets standard Can-CSA-Z-259.10-M90. Safety belts shall not be used as protection against falling.
- .3 Equipment, tools and protective gear which cannot be installed, fitted or used without compromising the health or safety of workers or the public shall be deemed inadequate for the work to be executed.
- .4 All mechanical equipment shall be inspected before delivery to the site. Before using any mechanical equipment, submit to Ministerial Representative a certificate of compliance signed by a qualified mechanic. Whenever he suspects a defect or accident risk, Ministerial Representative may at any time order the immediate shut-down of equipment and require a new inspection by a specialist of his own choosing.

1.4 MEETINGS

- .1 Contractor decisional representative must attend any meetings at which site safety and health issues are to be discussed
- .2 Set up a site safety committee, and convene meetings every in accordance with the Construction Safety Code (S-2.1, r.6).

1.5 LEGAL AND REGULATORY REQUIREMENTS

- .1 Comply with all legislation, regulations and standards applicable to the site and its related activities.
- .2 Comply with specified standards and regulations to ensure safe operations at site containing hazardous or toxic materials.
- .3 Regardless of the publication date shown in the construction safety code, always use the most recent version.

1.6 SITE-SPECIFIC CONDITIONS

- .1 At the site, the contractor must take account of the following specific conditions:
 - .1 Works in a building occupied in operation.
- .2 The Entrepreneur has to follow the instructions of the Ministerial Representative in what concerned the internal and outside temporary installations and concerning the accesses to the site of the works.

1.7 SAFETY AND HEALTH MANAGEMENT

- .1 Acknowledge and assume all the tasks and obligations which customarily devolve upon a principal Contractor under the terms of the Act Respecting Occupational Health and Safety (R.S.Q., chapter S-2.1) and the Construction Safety Code (S-2.1, r.6).
- .2 Develop a site-specific safety program based on the hazards identified and apply it from the start of project work until close-out is completed. The safety program must take account of all information appearing in 1.7 and must be submitted to all parties concerned, in accordance with the provisions set forth in 1.3. At a minimum, the site-specific safety program must include :
 - .1 Company safety and health policy.
 - .2 A description of the work, total costs, schedule and projected workforce curve.
 - .3 Flow chart of safety and health responsibility.
 - .4 The physical and material layout of the site.
 - .5 First-aid and first-line treatment standards.
 - .6 Identification of site-specific hazards.
 - .7 Risk assessment for the tasks to be carried out, including preventive measures and the procedures for applying them.
 - .8 Training requirements.
 - .9 Procedures in case of accident/injury
 - .10 Written commitment from all parties to comply with the prevention program.
 - .11 A site inspection schedule based on the preventive measures.
- .3 The contractor must draw up an effective emergency plan based on the characteristics and constraints of the site and its surroundings. Submit the emergency plan to all parties concerned, pursuant to the provisions of 1.3. The emergency plan must include:
 - .1 Evacuation procedure;
 - .2 Identification of resources (police, firefighters, ambulance services, etc.);
 - .3 Identification of persons in charge at the site;
 - .4 Identification of those with first-aid training;

- .5 Training required for those responsible for applying the plan;
- .6 Any other information needed, in the light of the site characteristics.

1.8 RESPONSIBILITIES

- .1 No matter the size of the construction site or how many workers are present at the workplace, designate a competent person to supervise and take responsibility for health and safety. Take all necessary measures to ensure the health and safety of persons and property at or in the immediate vicinity of the site and likely to be affected by any of the work.
- .2 Take all necessary measures to ensure application of and compliance with the safety and health requirements of the contract documents, applicable federal and provincial regulations and standards as well as the site-specific safety program, complying without delay with any order or correction notice issued by the Commission de la santé et de la sécurité du travail.
- .3 Take all necessary measures to keep the site clean and in good order throughout the course of the work

1.9 COMMUNICATIONS AND POSTING

- .1 Make all necessary arrangements to ensure effective communication of safety and health information at the site. As they arrive on site, all workers must be informed of their rights and obligations pertaining to the site specific safety program. The Contractor must insist on their right to refuse to perform work which they feel may threaten their own health, safety or physical integrity or that of other persons at the site. The Contractor must keep and update a written record of all information transmitted with signatures of all affected workers.
- .2 The following information and documents must be posted in a location readily accessible to all workers:
 - .1 Notice of site opening;
 - .2 Identification of principal Contractor;
 - .3 Company OSH policy;
 - .4 Site-specific safety program;
 - .5 Emergency plan;
 - .6 Data sheets for all hazardous material used at the site;
 - .7 Minutes of site committee meetings;
 - .8 Names of site committee representatives;
 - .9 Names of those with first-aid training;
 - .10 Action reports and correction notices issued by the CSST.

1.10 UNFORESEEN CIRCUMSTANCES

- .1 Whenever a source of danger not defined in the specifications or identified in the preliminary site inspection arises as a result of or in the course of the work, immediately suspend work, take appropriate temporary measures to protect the workers and the public and notify Ministerial Representative, both verbally and in writing. Then the Contractor must modify or update the site-specific safety program in order to resume work in safe conditions.

1.11 HEALTH/SAFETY/HYGIENE/ENVIRONMENTAL SPECIALISTS

- .1 As soon as work starts, hire one or several safety officer(s), pursuant to the provisions of sections 2.5.3 and 2.5.4 of the Construction Safety Code (S-2.1, r. 6) and give him/her/them the necessary authority to carry out the duties of this position, including authority to stop work on safety and health grounds.
- .2 As of [enter time], hire a qualified person whose duties will be to ensure compliance with and application of all legislation, regulations and standards and all contractual requirements pertaining to [specify area of expertise].
- .3 Provide this person with the authority, resources and tools needed for performance of his/her duties.
- .4 The person selected shall:
 - .1 have in-depth knowledge of legislation and regulations applicable to the site pertaining to (specify area of expertise).
 - .2 develop and disseminate a safety orientation program for all site workers.
 - .3 ensure that no worker is admitted to the site without having taken the safety orientation program and met all the training requirements of the applicable legislation and the site-specific safety program.
 - .4 inspect the work and ensure compliance with all regulatory requirements and those of the contract documents or the site-specific safety program.
 - .5 keep a daily log of actions taken and submitting a copy to Ministerial Representative each week.

1.12 INSPECTION OF SITE AND CORRECTION OF HAZARDOUS SITUATIONS

- .1 Inspect the work site and complete the site inspection sheet at least once a month if the work length exceeds 30 non working days. If the work length is less than 30 non working days, the frequency is at least once during the work length.
- .2 Immediately take all necessary measures to correct any lapses from legislative or regulatory requirements and any hazards identified by a government inspector, by the Ministerial Representative, by the site safety and health coordinator or during routine inspections.
- .3 Submit to Ministerial Representative written confirmation of all measures taken to correct lapses and hazardous situations.
- .4 Give the safety officer or, where there is no safety officer, the person assigned to safety and health responsibilities, full authority to order interruption and resuming of work as and when deemed necessary or desirable in the interests of safety and health. This person should always act so that the safety and health of the public and site workers and environmental protection take precedence over cost and scheduling considerations.
- .5 Without limiting the scope of sections 1.8 and 1.9, Ministerial Representative may order cessation of work if, in his/her view, there is any hazard or threat to the safety or health of site personnel or the public or to the environment.

1.13 POWDER ACTUATED DEVICES

- .1 Use of power hammers and other explosive-actuated devices must be authorized by Ministerial Representative.
- .2 Any person using a power hammer shall hold a training certificate and meet all requirements of Section 7 of the Construction Safety Code (S-2.1, r. 6).
- .3 Any other explosive-actuated device shall be used in accordance with the manufacturer's directions and applicable standards and regulations

***** END *****

**1.
Related requirements**

1. The specific requirements relating to inspection and to tests that must be performed by laboratories are indicated in various sections. The Ministerial representative will make control inspections of the execution of the work. This in no way limits the Contractor's responsibility to do his own inspections to comply with current standards and codes. The Ministerial representative may also hire testing laboratories to perform tests on the structure or on the tightness of the various systems, damaged or not, in order to identify noncompliance or omissions.

**2.
Contractor's responsibilities**

1. Provide the workforce and facilities needed to:
 - 1.1 allow access to the structures to be inspected and tested;
 - 1.2 facilitate inspections and tests;
 - 1.3 restore structures that are disturbed during inspections and tests.
2. Give Ministerial representative enough advance warning of operations so that he may plan visits for the inspection of specific structures or make appointments with laboratory staff and establish a testing schedule. When materials must be tested, and on demand of Ministerial representative, send directly the requested amount of representative samples to the testing laboratory. Assume the cost of work carried out to uncover and restore structures that were covered before the required inspection or tests were performed and approved by the Ministerial representative.

**3.
Rejected structures**

1. Remove defective elements deemed noncompliant with contract documents and rejected by the Ministerial representative, either because they were not built according to good engineering practices, they were made with defective materials or products, or they were damaged, even if they are already part of the finished structure. Replace or rebuild the elements in question according to the requirements in the contract documents. Immediately repair other contractors' structures that have been damaged during replacement work described above. If, in the Ministerial representative's opinion, it is not feasible to repair the structures deemed defective or noncompliant with contract documents, the ministerial representative may deduct from the contract price the difference in value between the structure that was built and the one prescribed in the contract documents, with the amount of this difference being determined by the Ministerial representative.

**4.
Workers' competence**

1. The Contractor must prove to the Ministerial representative, upon demand, that the workers possess the skills to carry out the work they have been assigned. Certification complying with current laws and regulations may be necessary. If the Ministerial representative is not satisfied by the proof, he may require the contractor to replace the workers.

***** END *****

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| 1.
Material installation and
removal | <ul style="list-style-type: none">.1 Provide, set-up or lay out necessary installation on site to allow for work to be done within the shortest time possible..2 As work progresses, dismantle material not needed and remove of the site..3 The place of work is within an occupied building. The area bounded by the project will be at the disposal of the contractor..4 Since the site is still in operation, services will remain active at all times and open lanes for local traffic. |
| 2.
On-site storage – Admissible
charges | <ul style="list-style-type: none">.1 Ensure that work is done within the time limits stated in the contract. Do not clutter site unnecessarily with equipment and materials..2 Do not overload or allow overloading on any part of the work so as to not compromise its integrity. |
| 3.
Sanitary installation | <ul style="list-style-type: none">.1 Sanitary facilities must be provided inside the security perimeter of the site area. |
| 4.
Signposting | <ul style="list-style-type: none">.1 Install, in pertinent areas, sign panels to indicate site limits, the direction of temporary relocated exits or other pertinent information. |
| 5.
Removal of temporary
installation | <ul style="list-style-type: none">.1 Remove from site all temporary installation when the Ministerial representative will judge it appropriate. |
| 6.
Protection of finished building
surfaces | <ul style="list-style-type: none">.1 During entire progression of work, protect all finished or partially finished surfaces, existing equipment and any furniture left in place..2 Plan for necessary screens, tarps and fences..3 Three (3) days prior to installation of protective components, confirm location of each protection with the Ministerial Representative, as well as installation schedule..4 Assume full responsibility for any damage caused to site caused by lack of protection or unsuitable protection. |

7.
Guardrails and temporary
barriers

- .1 Provide guardrails and temporary barriers to the building and parts under construction so as to ensure a perfect seal for dust control at all times.
- .2 Deploy tarps on racks and scaffolding to prevent infiltrations during nighttime, rain or inactivity and maintain a suitable environment by containing dust and aerosol vapors.
- .3 Seal and temporarily insulate all openings at the end of each site day before leaving the site. Erect and fix temporary protections so as to withstand winds of at least 120 km/h and weather of all kinds.
- .4 Deploy protective covers on electromechanical equipment and interior finishes to protect them from paint and fireproofing. Installation shall be watertight and restrict dust and aerosol vapors.

***** END *****

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| 1.
Related requirements | .1 | The contractor must comply with the requirements of the present section. |
| 2.
Cleanness of site | .1 | Ensure cleanliness of site and get rid of all piling up of rubbish and material for garbage. |
| | .2 | Remove from site debris and garbage materials and place them in garbage containers at the end of each work shift. |
| | .3 | Clean interior surfaces before starting finishing work and keep these areas free of dust and other impurities during said work. |
| | .4 | Clean daily occupied areas soiled by work of the Contractor or his subcontractors. Cleaning must be done immediately after work so the good functioning of the building is not hindered by it. |
| | .5 | Contractor have to existing and new construction to minimize contamination of clean room. Coordinate all protection measures with decontamination experts. |
| 3.
Final cleaning | .1 | When work is almost entirely done remove surplus material, tools and equipment. Remove construction material that is not necessary to the unfinished work. |
| | .2 | Remove debris and scrap material other than the ones generated by the Ministerial representative, other contractors or their employees and leave premises clean and ready to use. |
| | .3 | At the end of the work, remove surplus material, tools and equipment and also all construction material. Remove debris and scrap materials other than those generated by the Ministerial representative or other contractors. |
| | .4 | Scrap materials must be removed from site at pre-established fixed intervals, or eliminate them according to the Ministerial representative requirements. Do not burn scrap materials on site, unless you have an express approval from the Ministerial representative. |
| | .5 | Take the necessary required arrangements to obtain licenses from competent authorities to eliminate debris and scrap materials. |
| | .6 | Sweep all work surfaces prior to site inspection. |
| | .7 | Clean and polish windows, hardware pieces, chromed and enamel surfaces (oven dried), stainless steel, mechanical and electrical equipments. Replace all broken, scratched or damaged windows. |
| | .8 | Remove dust and stains, marks, scratches seen on decorative work, mechanical and electrical appliances, furniture components, walls, floors and ceilings. |
| | .9 | Dust interior surfaces of the building and vacuum, without forgetting to clean behind railings, louvers and registers. |
| | .10 | Wash, soap, wax, seal or treat in any way floor coverings, according to manufacturer indications. |
| | .11 | Examine the finishing, accessories and material to ensure that they all meet requirements stated regarding the quality of work and its functioning. |

- .12 Clean mechanical ducts in between the ceiling. Eliminate dust residues accumulated on equipment and mechanical ducts during the work.
- .13 Carefully clean material and appliances. Clean or replace filters of mechanical appliances.

***** END *****

PART 1 – GENERAL**1.1
Definitions**

- .1 Audit of garbage: The audit of garbage concerns the quantity of garbage that the works should generate. This verification assumes measurement and evaluation of the quantity, the composition and the origin of garbage produced and operational factors to their production.
- .2 Plan for reducing garbage: Written documents in which reduction, reuse and recycling opportunities are studied. The garbage reduction plan is based on data given by the garbage control sheet.
- .3 Audit of demolition garbage: Is applied to garbage generated by this work.
- .4 Sorting programs of material at the source: Sorting activities, on the site of reusable and recyclable garbage, so they may be classified in appropriate categories
- .5 Coordination for garbage management: A chosen person and working on the site. Other persons must be designated among the personnel of each subcontractor to ensure coordination of the management of garbage with the Coordinator.
- .6 Sorted garbage: Garbage already classified by type.

**1.2
Use of premises and
installations**

- .1 Do the work without preventing normal use of premises.
- .2 Put in place provisory safety measures, approved by the Ministerial representative.

**1.3
Sorting program for demolition
materials**

- .1 Prepare sorting program for demolition material before beginning works.
- .2 Following approved methods by the Ministerial representative and with his authorization, begin the sorting program of material to be recuperated for recycling.
- .3 On the site, anticipate necessary installations to collect, handle and transport projected quantities of recyclable garbage.
- .4 Material must be collected, handled and evacuated either at the sorting stage or to be sorted at an independent site. Recuperated materials must be transported towards approved installation and authorized for recycling.
- .5 Hold information and awareness meeting for workers that will be working on the site and give them written information on the procedure to be followed for recuperation.

**1.4
Sorting program for construction
garbage, at the source**

- .1 Prepare sorting program for construction residue prior to the beginning of work.
- .2 Following approved method by the Ministerial representative and with his authorization, begin sorting program at the source where all garbage is generated by the works.
- .3 On the site, anticipate necessary installation to collect, handle and stock projected quantities of reusable and or recyclable garbage.
- .4 Provide containers in which reusable and /or recyclable garbage will be put in.

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| | .5 | Place containers in areas where it will be easy to deposit materials without causing a problem for other activities on the site. |
| | .6 | Place sorted material in areas where they will be the least damaged and where they will be easily accessible. |
| | .7 | Materials should be collected, handled and stocked on the site, then evacuated at the sorting stage. Recovered materials must be transported towards approved and authorized installations for recycling. |
| | .8 | Hold information and awareness meeting for workers that will be working on the site and give them written information concerning the procedure to be followed for recuperation. |
| 1.5
Internet links on garbage treatment | .1 | http://www.mddep.gouv.qc.ca/matieres/valorisation.htm#debris
Available documentations: <ul style="list-style-type: none">- Information sheet : « <i>Construction residue, renovation and demolition</i> »- <i>Information guide on recycling of dry materials.</i> |
| | .2 | http://www.3rmcdq.qc.ca/ |
| | .3 | http://www.usqbc.org/ |
| | .4 | http://www.recyc-quebec.gouv.qc.ca |
| | .5 | http://www.cca-acc.com |
| 1.6
Garbage removal | .1 | It is forbidden to bury debris and garbage on the site. |
| | .2 | It is forbidden to throw garbage, mineral essences, oil, paint thinner in water ways, sanitary and rain sewers. |
| 1.7
Stoking, Handling and protection of materials | .1 | Stock, in designated areas on the site, material intended to be reused, recycled or recuperated. |
| | .2 | If not stated otherwise, materials that must be disposed of, become the property of the contractor. |
| | .3 | Protect, pile up, stock and list all components to be recuperated. |
| | .4 | Separate non recoverable components from recoverable ones. Transport and deliver non recoverable components to authorized elimination installation. |
| | .5 | Support all work affected by the works. Should the safety of the building become compromised, stop work and inform the Ministerial representative immediately. |
| | .6 | Protect superficial water evacuation works and all electrical and mechanical installations to prevent damage or blockage. |
| 1.8
Work schedule | .1 | Coordinate management of garbage with other activities to ensure the good order of the works. |

PART 2 – PRODUCTS

- 2.1** .1 Without object
Without object

PART 3 – WORK

- 3.1** .1 Do work as per garbage sorting program.
General .2 Handle as per pertinent codes and regulations for garbage that are not reusable, recoverable and or recyclable.
- 3.2** .1 Once work is done, remove all tools and garbage. Leave premises clean and in good order.
Cleaning .2 Clean work areas as work progresses.
 .3 Sort, at the source, all material that must be reused/recycled and place them in designated areas.
- 3.3** .1 Sort materials from the general flow of garbage. Pile them in separate piles or in distinct containers, with the approbation of the Ministerial representative and as per pertinent regulations for fire safety. Identify containers and areas for piling. Provide instructions concerning removal practices.
Recovering material and to be sent to recovering sites .2 It is forbidden to sale recovered material on site.

***** END *****

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- 1. Documents to submit**
- .1 Information must be prepared by competent persons, having the required knowledge pertaining to functioning and maintenance for the described products.
 - .2 Submit a sample of operation and maintenance manual in their final form, before final reception of work.
 - .3 Submitted samples will be returned with comments from the Ministerial representative.
 - .4 If need be, review content of documents before to re-submitting.
 - .5 Once manuals are ready and approved, hand over one (1) definite copy of maintenance and operation manuals to the ministerial representative in addition to a digital version of those documents. Files must be in PDF format and organized according to the folders' structure provided by ministerial representative.
 - .6 In addition to information written in this present section, refer to Ministerial Representative (in engineering and other specialties) documents to know the requirements and the content of manuals to be submitted.
- 2. Presentation**
- .1 Present data in the form of an instruction manual.
 - .2 Use three D shape ring rigid vinyl binders with loose leaves, 219mm x 279mm.
 - .3 The digital version will be handed on a DVD disc.
 - .4 When multiple binders are needed, regroup data according to a logic order. Clearly indicate content of each binder on the spine.
 - .5 On the covering page of each binder you must indicate the name of the document, – Project file, typed or written in square letters, name of the project and table of contents.
 - .6 Organize the contents per section numbers of the tender and the order as they appear on the table of content.
 - .7 Anticipate, for each product and each system a tab index on which is typed the description of the product and the list of main equipment pieces.
 - .8 The text must be printed or be typed data from the manufacturer.
 - .9 Fit the drawings with a reinforced perforated tab. Insert in the binder and fold large drawings according to format of the text pages.
- 3. Content of each volume of the final project file**
- .1 Table of contents: indicate designation of project:
 - .1 Date for handing over the documents;
 - .2 Name, address and telephone number of the Ministerial representative, of the Contractor and the names of their authorized representatives;
 - .3 A list of products and systems, indexed, according to the contents of the binder;
 - .4 A list of subcontractors and pertinent information.
 - .2 For each product or system indicate the following:
 - .1 Name, address and telephone number of subcontractors and suppliers;

- .2 Name of persons responsible for the project;
- .3 Name of local distributors for spare parts.
- .3 Technical data: Mark each sheet to clearly indicate products and specific parts. Give proper directives pertaining to installation. Delete all none pertinent information.
- .4 Drawings: Drawings are used to supplement the charts and to illustrate the relation between various elements of material and systems; they include diagrams of order and principle.
- .5 Typed text: according to need, to complete technical data. Give instructions in a logic sequence for each intervention, incorporating information from manufacturer.
- .6 The following data specified in individual section of Divisions 02 to 45.
 - .1 List of equipment, including service center.
 - .2 Information written on identification plate like the number of the equipment, commercial brand, dimensions, capacity or power, serial number.
 - .3 List of pieces.
 - .4 Details pertaining to installation of equipment.
 - .5 Instruction pertaining to the operation of the equipment.
 - .6 Instruction pertaining to maintenance of equipment.
 - .7 Instruction pertaining to finish maintenance.
- .7 Divide binders by specialty: architecture, structure, exterior layout, mechanic, electricity, etc.
- .8 Refer to contract documents of all disciplines of the Ministerial representative.
- .9 Administrative information: Include the following information:
 - .1 Certificate of compliance to the law and regulations pertaining to economy of energy;
 - .2 Certificate of compliance given by Commission des normes, de l'équité, de la santé et de la sécurité du travail
 - .3 Certificate of company in order with the Quebec Construction Commission.;
- .4 Contractor must make a statutory declaration. It must accompany his request to free the deduction, security deposit or both when a substantial part of the work is done or finished.
- .5 Receipts from subcontractors and suppliers;
- .6 Lift and other raising appliance inspection report by the Building Control Board;
- .7 Guarantee asked for each sections;
- .8 Acknowledgment of receipt must be given by the ministerial representative for all keys, all keys for boxes and other components given directly to the ministerial representative;
- .9 A list of paint products and color used;
- .10 Maintenance instruction for surfaces and requested materials.
- .10 Shop drawings:
 - .1 Separately bind a complete set of definite revised shop drawings and technical data;
- .11 List of special tools provided by the ministerial representative;

**4.
Documents and samples
to add to the project file**

- .12 List of spare parts to give to the ministerial representative;
 - .13 Inventory of replacement material given to the ministerial representative with acknowledgment of receipt of these products;
 - .14 Drawings "as built", on which real site conditions were written, as described in article 7.
- .1 In addition to other requirements outlined in these documents, store on the site, for the ministerial representative a sample or set of the following documents:
 - .1 Contractual drawings;
 - .2 Tender;
 - .3 addenda;
 - .4 Order of modification and other amendments to the contract;
 - .5 Revised shop drawings, technical data and samples;
 - .6 Records of tests made on the site;
 - .7 Inspection certificates;
 - .8 Certificates given by the manufacturer.
 - .2 Store all file project documents and samples used for the project apart from the documents used for the work. Anticipate filing cabinets, shelves and a safe storage area.
 - .3 Label documents and file according to list of section numbers stated in the table of contents of the file project. Clearly write FILE PROJECT in square letters on a label for each document.
 - .4 Keep project file documents clean, dry and readable. Do not use as execution documents for the work.
 - .5 The Ministerial representative must have access to documents and samples of the project file for inspection.

**5.
Consignment of conditions
of site (building and site)**

- .1 Write down information on a set of opaque drawings with black lines and also in project file samples given by the Ministerial representative. For the works, the Contractor must provide three (3) sets of all Drawings given for construction, corrected with notes that state real conditions on the site.
- .2 Write down information with fine line black felt markers, anticipating a color for each different important system.
- .3 Write down information as work progresses. Do not conceal works before required information is registered.
- .4 Contractual drawings and shop drawings : Clearly indicate each data, to show work as is, including what follows :
 - .1 Depth measured of foundation elements in comparison with the level of the finished first floor.
 - .2 The position measured horizontally and vertically on the plans for utility ducts and underground accessories in comparison with permanent layout on the surface.

6.
Matériel and systems

- .3 Position of utility ducts and interior accessories, measured in comparison with visible and accessible construction elements.
- .4 Modifications done on the spot to dimensions and details of works.
- .5 Changes done following order for modification and site instructions.
- .6 Details not shown on original contractual documents.
- .7 Reference to shop drawings and related modifications.
- .5 Tender: clearly write each facts to describe works as they are, including what follows :
 - .1 Name of manufacturer, commercial brand and catalogue number for each product installed, especially optional and replacement elements.
 - .2 Changes being part of the addenda or order for modification.
- .6 Other documents: keep manufacturer's certificates, inspection certificates, records of tests done on site prescribed for each of the technical sections of this tender.
- .1 For each piece of material and each system:
 - .1 Give description of appliance or of system for each component piece;
 - .2 Indicate its function, normal operation characteristics and limits;
 - .3 Give characteristic curves with technical data and results of tests;
 - .4 Give complete list and commercial number for pieces that could be replaced.
- .2 Provide lists of supply circuits for distribution panels, with indication of electrical characteristics, command and telecommunication circuits.
- .3 Provide outline of color coded cables for installed material.
- .4 Operation methods: Indicate instructions and sequences for starting, breaking in and normal operation; adjustment, control, stop, out of order and for help; summer and winter operation and for any other particular instruction.
- .5 Maintenance: Provide instructions pertaining to regular maintenance and search of breakdown and instruction related to dismantling, repair and reassembly. Give instruction for alignment, tuning, balancing and how to check some components and some networks.
- .6 Provide maintenance schedule for lubrication and a list of necessary lubricant.
- .7 Provide written instructions from manufacturer concerning operation and maintenance of components.
- .8 Provide sequential description of prepared operations by various appliance manufacturers and for control/ adjustment devices.
- .9 Provide a list of original manufacturer's pieces, illustrations, drawings and mounting outline necessary for maintenance.
- .10 Provide outlines of controls/adjustments for appliances installed and prepared by different manufacturer.
- .11 Provide coordination drawings from Contractor and color coded outline for installed

pipng.

- .12 Provide a list of labeling numbers for faucets, with position indication for each appliance. Refer to control and principle outlines.
- .13 Provide a list of spare parts from original manufacturer with indication of current prices and quality recommended to keep in stock.
- .14 Provide test reports for balancing prescribed in Ministerial representative's documents.
- .15 Additional requirements: according to requirements of various technical sections in the tender.

7. Materials and finishing products

- .1 Construction material, finishing products and other products to be applied: provide all technical data and indicate catalogue number, dimensions, composition, designation of colors and textures of products and materials. Give necessary requirements to order special products.
- .2 Provide instruction concerning cleaning products and methods, recommended cleaning and maintenance schedule. Indicate precautions to be taken against detrimental methods and toxic products.
- .3 Additional requirements: according to requirements of various technical sections of the tender.

**8.
Replacement parts**

- .1 Provide spare parts according to quantity requirements in various technical sections of the tender.
- .2 Provided spare parts must come from the same manufacturer and be of the same quality as of incorporated components.
- .3 Deliver and store spare parts in selected area.
- .4 Receive and take inventory of every spare part, then submit the inventory list to the Ministerial representative. Insert the approved list in maintenance manual.
- .5 Write the following information:
 - .1 Number of spare parts;
 - .2 Equipment of system for which parts are used;
 - .3 Instruction concerning their installation;
 - .4 Name and address of closest manufacturer.
- .6 Keep a receipt for all parts delivered and submit it before final payment.

**9.
Replacement
Materials/Material**

- .1 Provide material and replacement materials according to indicated quantities requested in various technical section of the tender.
- .2 Material and replacement materials must come from the same manufacturer and must be of same quality as of materials already incorporated in the work.
- .3 Deliver and store material/ replacement materials where indicated.
- .4 Receive and take inventory of material and replacement materials, then submit inventory list to the Ministerial representative. Insert approved list in operation manual.
- .5 Keep a receipt of all parts delivered and submit if before final payment.

**10.
Special tools**

- .1 Provide special tools according to prescribed quantities in various technical sections of the tender.
- .2 Tool must bear a label stating its function and material where they are met to be used.
- .3 Deliver and store special tools where indicated.
- .4 Receive and take inventory of special tools, then submit inventory list to the Ministerial representative. Insert approved list in maintenance manual.

**11.
Storage handling and
protection**

- .1 Store spare parts, material, replacement material and special tools to prevent damage and deterioration.
- .2 Store spare parts, material, replacement material and special tools in their original packaging, kept in good order, bearing the seal and the label of the manufacturer.
- .3 Store all components sensitive to bad weather damage in weatherproof areas.
- .4 Store paint and product sensitive to very cold weather in a well ventilated heated room.

**12.
Guarantees and bonds**

- .5 Get rid of components, damaged and/or deteriorated products. Replace them without additional costs, to the satisfaction of the Ministerial representative.
- .1 Separate each guarantee or bond with tabs index, according to the list given on the table of contents.
- .2 Give list of subcontractors, suppliers and manufacturers with names, addresses and telephone numbers of a chosen representative for each one.
- .3 Obtain double copies of signed guarantees and bonds, by the subcontractors, suppliers and manufacturers, within ten (10) days following the end of the work concerned.
- .4 Except for what concerns the elements put into service with the authorization of the Ministerial representative, do not modify the entry data in force on the guarantee before the date of the end of the work is established.
- .5 Ensure that all documents are in good order, that they have all necessary information and that they are notarized.
- .6 Countersign the documents to surrender when necessary.
- .7 Retain the guarantees and bonds until it is time to hand them over. Include them in the final project file at the end of the work.

***** END *****

PART 1 – GENERAL**1.1
Regulations**

1. All demolition works will be done according authority instructions having jurisdiction and after having paid and obtain all licenses pertaining to the works.

**1.2
Site examination**

1. Contractor must visit premises and be familiar with work conditions before presenting his tender. No modifications to the contract will be given for difficulties encountered in doing the works that could have been anticipated following a careful study of the premises.

**1.3
Safety measures**

1. Take all necessary precautions to prevent any displacement or sagging of existing building or parts of the building. Provide and install all necessary pieces for reinforcement or propping-up. Repair damaged work and assume responsibility for injuries that result from demolition work.

**1.4
Property**

1. All materials coming from demolition work, that are not indicated as reusable or that the Ministerial representative did not reserve before demolition, become the property of the Contractor who has to dispose of it as he wishes.

**1.5
Actual conditions**

1. Contractor will take possession of actual building as is, after being notified that the contract was awarded to him.

PART 2 – PRODUCTS**2.1
Products**

1. Provide all products, equipment and labor necessary for demolition, the openings, the product recovery and cleaning of surfaces to optimize installation of new materials.
2. Provide all the products and equipment and labor necessary to remove debris.
3. Provide all the products, equipment and labor for resurfacing work (patching). Products must be new and free from defects. Use materials identical to existing.

PART 3 – WORK**3.1
Demolition**

1. Demolish part of existing building to allow for restructuration and repair works according to drawings.
Note: Openings in walls, floors and ceiling of a surface equivalent to a 6" diameter or more are the responsibility of the general contractor unless stated otherwise.
2. Remove and take out of site all demolition garbage and residues and, if need be, make repairs of all damage done to the property, caused by the works, and that goes for all trade people related to this project.
3. Contractor must anticipate waterproof, dustproof and noise proof closings for parts of the building occupied during demolition work.

**3.2
Refurbishing**

1. Contractor will verify all building levels to ensure proper connecting as foreseen and to present a continued smooth surface between existing finish and new ones. Contractor will do all joints or assembly required to allow differential movements without causing fissures.
2. **Surface refurbishing will be done with same materials as existing ones, same textures and same colors or something equivalent in case materials are no longer available or discontinued.** Touch-ups will be done up to closest angles to make touch-up coating or paint disappear.
3. **Contractor must refurbish floors, walls and ceilings where equipments, appliance or mechanical or electrical ducks must be added, removed or relocated. This includes removal of equipments by Ministerial representative before starting of the works.**

**3.3
Material handling**

1. Contractor will be responsible for technique and circuit chosen for handling of framing, concrete and other material components, If need be, remove existing window or windows or glass and other unsafe components. Protect adequately all components in place, such as floors, walls and ceilings. Repair if altered in any way because of the works. If need be, make protective surfaces, temporary partitions to protect from shocks. Restrain access and protect from noise and dust all parts of the building being redone. Return with care components to their position and replace if damaged because of the works.
2. Contractor must circulate by route imposed by Ministerial representative. No additional cost will be accepted for material handling. If this operation influences the range of the works, the route could be presented when visited by tenders.
3. Transportation must be done in a safety manner, respecting patrons when circulating inside the building.

***** END *****

PART 1 - GENERAL

1.1

Included works

Non-exhaustive list:

1. Provide and install all materials for **metal structures and aluminium** indicated in the drawings, specified in the current section and needed to complete the structure; provide the equipment, tools and all labour required for its design, fabrication, delivery and installation.
 1. **Galvanized steel elements:**
 - a. Tubes, rods, profiles, galvanized plates shown in the drawings.
 2. **Primed steel elements:**
 - a. Tubes, rods, profiles, plates primed shown in the drawings.
 3. **Aluminium elements :**
 - a. Tubes, rods, profiles, aluminum plates shown in the drawings.

1.2

References

Conform to current, applicable standards (latest version). When submitting documents, specify the reference standard or standards and their edition.

Non-exhaustive list:

1. American Society for Testing and Materials International, (ASTM)
 - 1.1 ASTM A53/A53M, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - 1.2 ASTM A269, Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
 - 1.3 ASTM A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - 1.4 ASTM B209M, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - 1.5 ASTM B210M, Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless tubes.
 - 1.6 ASTM B211M, Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod and Wire.
 - 1.7 ASTM F593, Specification for Stainless Steel Bolts, Hex Cap Screws and Studs.
2. Canadian General Standards Board (CGSB)
 - 2.1 CAN/CGSB-1.40, Anticorrosive Structural Steel Alkyd Primer.
 - 2.2 CAN/CGSB-1.181, Ready-mixed Organic Zinc-Rich Coating.
3. Canadian Standards Association (CSA)
 - 3.1 CAN/CSA-G40.20 and G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - 3.2 CAN/CSA-S16.1-01, Limit States Design of Steel Structures.

- 3.3 CAN/CSA-S157, Strength Design in Aluminum.
- 3.4 CAN/CSA W47.1, Certification of Companies for Fusion Welding of Steel.
- 3.5 CAN/CSA W47.2, Certification of Companies for Fusion Welding of Aluminum.
- 3.6 CAN/CSA W48, Filler Metals and Allied Materials for Metal Arc Welding (written in collaboration with the Canadian Welding Bureau).
- 3.7 CAN/CSA W59, Welded Steel Construction (Metal Arc Welding) (metric).
- 3.8 CAN/CSA W59.2, Welded Aluminum Construction.

4. Other:

- 1. Aluminum Association Inc. (AA), Designation System for Aluminium Finishes.
- 2. Aluminum Welding Society (AWS), A5.10 and A5.10M, Specification for Bare Aluminum and Aluminum Alloy Welding Electrodes and Rods.

**1.3
Calculation criteria**

- 1. Metal and aluminum structures and all fastening components must be designed and calculated to withstand overloads in the vertical and horizontal directions, as per the requirements of the NBC of Canada, 2010, latest version.

**1.4
Documents and samples to be submitted**

- 1. Data sheets: submit data sheets as per section 01 33 00E – Submittal procedures.
- 2. Shop drawings: submit required shop drawings as per section 01 33 00E – Submittal procedures. Shop drawings must indicate or show the materials, core thickness, finish, assemblies, joints, anchoring method and number of anchors, supports, reinforcements, details and accessories.
- 3. Certificates: submit documents as per section 01 33 00E – Submittal procedures, signed by the manufacturer, certifying that the products, materials and equipment satisfy the prescriptions regarding physical characteristics and performance criteria.

**1.5
Transport, storage and handling**

- 1. Packaging, shipping, handling and unloading
 - 1.1 The equipment and materials must be transported, stored, handled and protected adequately.
- 2. Storage and protection
 - 2.1 Visible surfaces of metal and/or aluminum elements must be covered with self-adhesive building paper or plastic film before the elements are shipped to the building site.
 - 2.2 Surfaces must only have their protective lining removed during the building's final cleaning. Provide the necessary instructions for the removal of this protection.

PART 2 - PRODUCTS

**2.1
Materials and equipment**

- 1. Steel plates and sections: grade 300W or 350W as per CAN/CSA-G40.20 and G40.21 standards.

2. Steel pipes: as per ASTM A53/A53M standard, extra-strong series.
3. Steel plates and sheets: as per ASTM-A 36 standard.
4. Welding materials: as per CAN/CSA W59 standard.
5. Welding electrodes: as per standards in the CAN/CSA W48 series.
6. Steel bolts and anchor bolts: as per ASTM A307 standard (if required).
7. Aluminum welding bars: as per AWS A5.10 and A5.10M standards.
8. Aluminum and aluminum alloy bars, rods, wires, profiles and extruded tubes: as per ASTM B211M standard, **throughout unless otherwise indicated.**
9. Aluminum tubes made by drawing: as per ASTM B210M standard.
10. Aluminum plates and sheets: as per ASTM B209M standard.
11. Aluminum profiles: the aluminum must be of AA.6063-T5 alloy and temper. All the profiles shall conform to the details shown in the drawings. They shall have square, well defined edges and be free of any defect affecting appearance or strength, (enamelled finish and colour, see article 2.3 Finish).
12. Aluminum plates: with registered trademark, for general use, smooth, at least 3.2 mm thick, (enamelled finish and colour, see article 2.3 Finish).
13. Thin aluminum sheet: with registered trademark, for general use, smooth, at least 1.3-mm thick, (enamelled finish and colour, see article 2.3 Finish).
14. Galvanized steel sheet metal minimum 20 gauge;
15. Finishing paint: system quality and color, see article 2.3 Finish.

2.2 General

1. Structures must be right, square, well aligned and in accordance with prescribed dimensions; the joints must be tight and well secured.
2. Unless otherwise indicated, use stainless steel, flathead, self-tapping, loosening-resistant screws for threaded assemblies.
3. Inasmuch as possible, structures must be adjusted and assembled in shop, and delivered ready to install.
4. Visible welds must be continuous along the joint's entire length; they must be filed or ground so as to present a smooth, even surface.

2.3 Finish

1. **Primed steel:** Paint layer applied in printing workshop, according to standard CAN / CGSB 1.40.
 - a. Retouching on site: Paint layer printing, ready to apply, according to standard CAN / CGSB 1.40.
 - b. Finishes: Powder paint sprayer to apply and fixed by firing.
2. **Aluminum:** aluminum anodized clear, according to standard AA-M12-A31-C22 Class II (10 microns).

2.4 Insulating coating

1. Plan on using tape and/or neoprene as a separator wherever indicated and/or required:

- 1.1 metals of a different kinds, with the exception of stainless steel, zinc and white bronze of reduced surface area;

2.5**Retrieving and editing items,
manufacturing**

1. Take and verify all dimensions and levels on site and submit shop drawings based on actual verified dimensions.
2. Manufacture elements in workshop in accordance with approved shop drawings.
3. If required, first submit a sample of the work before proceeding on a global basis.
4. Examine existing elements to change. Dismantle, recuperate and transport them to change them according to the instructions in the workshop.
5. In the workshop, sawing, cutting and / or extend the room for change.
6. All cutting part must be removed.
7. Use materials identical to existing (stainless steel, galvanized steel, primed steel, aluminum as applicable) and equal or greater strength.
8. Add new parts as needed.
9. Modified products must be unmarked and without default.
10. Surfaces must be perfectly smooth and clean, as if new.

PART 3 – WORK

3.1

Installation

1. Reinstall existing elements retrieved, modified in the workshop. Place them back according to the new layout, see drawings. Provide all funds anchor necessary. Secure each piece, as the existing. Also install new elements according to the indications in approved shop drawings. Respect accepted tolerances without combining them. Components shall be installed in precise positions, adjusted, square, and plumb with parallel, uniform joints.
2. Unless otherwise indicated, assemble all the elements **by bolting**. Provide and install all anchors in stainless steel, including bolts, lock washers, nuts, half-round tongues, locks, expansion parts, etc., and if possible, eliminate on-site welding. Do not secure support plates in sliding joints to allow the structural system to expand. Tighten bolted assemblies evenly with the required torque. Inspect and correct deficiencies.
3. Welding work will not be permitted on the site.

3.2

Cleaning

1. Clean structures after installation in order to rid them of the dust generated by construction work or by the premises themselves.
2. Once the installation is complete, rid the site of excess materials, waste, tools and barriers used to protect the equipment.

*****END*****

PART 1 – GENERAL**1.1****Related work**

1. Sheet insulation
2. Joint sealing

1.2**Scope of work**

Non-exhaustive list of work in this section:

1. Supply and installation of sheet vapour barrier systems under concrete slab.

1.3**Reference standards**

1. CAN/CGSB-51.33-[M80], Vapour barrier sheet for use in buildings.

1.4**Work samples**

1. Submit samples as per the requirements in Section 01 45 00 – Quality Control.
2. Build a sample illustrating the method of vapour barrier installation in a re-entrant corner and the method of executing a lap joint. The sample may be part of the finished work.
3. Prior to beginning vapour barrier installation, allow the consultant a 24-hour period so that he may approve the sample.

PART 2 – PRODUCTS**2.1****Self-adhesive air/vapour barrier**

1. Self-adhesive air/vapour barrier membrane made of bitumen modified with SBS polymers protected by aluminium foil
2. Reference product: Soprasolin HD

2.2**Accessories**

1. Sealing compounds: Use sealing products recommended by the membrane manufacturer in question.
2. Adhesive tape, as per manufacturer recommendations.

PART 3 – WORK**3.1****Membrane installation**

1. To minimize the number of joints, use the largest possible sheets.
2. Ensure that the sheets form a continuous protective barrier. If necessary, repair perforations and tears with sealing tape before hiding the structure.
3. Prime the surface to be covered and seal the membrane;
4. Install from bottom to top to ensure water drainage;
Roll the surface of the membrane;
Overlap a minimum of 150mm at all transitions;

3.2
Openings in exterior walls

1. Trim vapour barrier around openings; overlap sheet over framework and seal joints.

***** END *****

PARTIE 1 GENERAL**1. DOCUMENTS/SAMPLE SUBMITALS**

1. Submit the required data sheets as well as the manufacturer's product specifications and documentation in accordance with section 01 33 00 - Documents and samples to be submitted.
2. Submit the installation instructions provided by the manufacturer.

2. QUALITY ASSURANCE

1. Submit test reports certifying that products, materials and equipment meet the physical characteristics and performance criteria requirements.
2. Submit documents signed by the manufacturer certifying that the products, materials and equipment meet the physical characteristics and performance requirements standard.

PARTIE 2 PRODUCTS

1. Submit documents signed by the manufacturer certifying that the products, materials and equipment meet the physical characteristics and performance requirements standard.

1. ACOUSTIC INSULATION

1. Rock wool insulation made from natural rock and recycled materials, soundproofing and fire-resistant, in compliance with standards:
 1. CAN/ULC-S702-09, Thermal Insulation of Rockwool for Buildings
 2. ASTM C 665, Thermal insulation in rock wool blankets
 3. ASTM C 553, Thermal insulation in rock wool blankets
 4. Thickness: 76 mm, unless otherwise indicated on the plans.
2. Reference product:
 1. **AFB of ROCKWOOL**

2. THERMAL INSULATION

1. Semi-rigid insulating panel made of rock wool, non-combustible and lightweight, in compliance with standards:
 1. CAN/ULC-S702-09, Thermal Insulation of Rockwool for Buildings
 2. ASTM C 665, Thermal insulation in rock wool blankets
 3. ASTM C 553, Thermal insulation in rock wool blankets
 4. Dimensions: adjusted to the spacing of the uprights.
 5. Thickness: to fill the cavity with the amount into which the mattress will be inserted
 6. Reference product:
 1. **COMFORTBATT® of ROCKWOOL**

3. ACCESSOIRES

1. Insulation fasteners: through-type, cold-rolled and perforated carbon steel, 0.8 mm thick, 50 x 50 mm thick and coated with adhesive on the back; annealed steel rod 2.5 mm in diameter and of a length appropriate to the thickness of the insulation; self-locking washers 25 mm in diameter.
 1. Reference product:
 1. See manufacturer's recommendation;

PARTIE 3 EXECUTION

1. MANUFACTURER'S INSTRUCTIONS

1. Comply with the manufacturer's written requirements, recommendations and specifications, including technical bulletins and installation instructions specified in the product catalogues and on packaging cartons, as well as the indications in the technical data sheets.

2. INSULATION INSTALLATION

1. Use at least 5 mechanical fasteners per panel held under pressure by supporting elements. Mount the fasteners at least 38 mm deep, although the depth may vary depending on the designer.
2. Install the insulation in such a way as to provide continuous thermal and/or acoustic protection to the building's elements and voids and in accordance with the requirements of the current Quebec Construction Code.
3. Install the insulation according to the thickness specified in the drawings (different depending on the location).
4. Cut the insulation facing the bays and other through elements. Avoid cuts and eliminate any mattresses less than 30mm wide.
5. Carefully adjust the insulation to the elements to be covered as well as around electrical boxes, pipes, air ducts and frames that pass through it.
6. Do not compress the insulation to fit the spaces to be insulated.
7. Do not cover the insulation until the installation work has been inspected and approved by the Ministerial Representative.

3. INSULATION FIXATION IN METTALIC WALLS

1. Use at least 5 mechanical fasteners per panel held under pressure by supporting elements. Mount the fasteners at least 38 mm deep, although the depth may vary depending on the designer.
2. The number of pins or screws must be adjusted to properly hold the insulation in place, depending on the level of support provided by the staple and gap system.

4. CLEANING

1. Once the installation work is complete, remove excess materials, waste materials, tools and safety barriers from the site.

END OF SECTION

PART 1 – GENERAL**1.1****Related work**

1. Vapour and air barrier systems
2. Joint sealing

1.2**Reference standards**

1. ASTM E96, Test Methods for Water Vapour Transmission of Materials
2. CAN/CGSB-51.20-M87, Thermal insulation, polystyrene
3. American Society for Testing and Materials International (ASTM)
 - ASTM E 96-00e1, Test Methods for Water Vapour Transmission of Materials
4. Canadian General Standards Board (CGSB)
 - CGSB 71-GP-24M-77(C1983), Adhesive, Flexible, for Bonding Cellular Polystyrene Insulation
5. Underwriters Laboratories of Canada (ULC)
 - CAN/ULC-S770, Standard Test Method for Determination of Long-term Thermal Resistance of Closed-Cell Thermal Insulating Foams
7. Environment Choice Program (ECP)
 - DCC-016-97, Thermal Insulation

1.3**Guarantee**

1. The contractor must provide a written guarantee on behalf of the Ministerial Representative covering material and labour for a period of two years in the event of any defects.
2. The contractor must provide a written guarantee certifying that the product's thermal resistance is 100% guaranteed for life, at no cost.

PART 2 – PRODUCTS**2.1****Rigid insulation panel,**

1. Rigid extruded polystyrene insulation with thermal and moisture resistance properties. Use panels of at least 610 x 2440mm.
2. Reference product: Owens Corning FOAMULAR C-300 or approved equivalent

2.3**Adhesives**

1. Type B: Synthetic rubber base, solvent type, can be applied in continuous fashion by trowel at a temperature of 12 to 50°C, anti-mould and compatible with insulation, compliant with standard CGSB 71-GP-24M, Type II.
2. The contractor shall be responsible for checking the compatibility of products that come into contact with the adhesive, such as the waterproof membrane, with manufacturers.

**2.4
Accessories
(IF REQUIRED)**

1. Insulation fasteners: Transverse type, made of cold-laminated carbon steel and perforated, 0.8 mm thick, measuring 50 x 50 mm (2"x 2") and coated with an adhesive on the back; annealed steel rod 2.5 mm (0.1") in diameter and of an appropriate length according to insulation thickness; self-locking washers 25 mm (1") in diameter.

PART 3 – WORK**3.1
Implementation**

1. Compliance: Comply with the manufacturer's written requirements, recommendations and specifications, including technical bulletins and installation instructions provided in product catalogues and on packaging, as well as with instructions provided in data sheets.

**3.2
Quality of execution**

2. Install insulation once all surface materials are dry.
3. For under-slab installation, panels must be laid on a level surface equipped with a vapour barrier.
4. Install insulation in such a fashion as to ensure continuous thermal protection for building elements and empty spaces.
5. Adjust insulation carefully around service boxes, plumbing pipes and accessories, heating ducts, exterior doors and windows, as well as other projecting elements.
6. Keep insulation at a distance of at least 75 mm (3") from any heat source, such as recessed lighting fixtures, and at least 50 mm (2") from type-A flue linings compliant with standard CAN4S604 and type B or L vents compliant with standards CAN/CGA-B149.1 and CAN/CGA-B149.2.
7. Carefully cut and trim insulation to ensure it fills all free spaces. Make tight joints and stagger vertical joints. Use only insulating panels with edges that are not chipped or broken. Use the biggest panels possible in order to minimize the number of joints.
8. If several layers of insulation are to be installed, stagger vertical and horizontal joints.
9. Do not cover insulation until installation work has been inspected and approved by contractor.

**3.3
Installation of rigid insulation
GENERAL**

1. Apply a coat of type-B adhesive on polystyrene insulation boards as per manufacturer recommendations. Adhesive must be applied in a small bead measuring 6 mm, applied in a wave-like shape with 150 mm spacing between bead lines.
2. Before the adhesive forms a skin, dip the insulation boards into the vapour-barrier-type adhesive, applied as recommended.
3. Do not glue insulation board joints that coincide with expansion or contraction joints. Before putting the insulation in place, close the expansion and contraction joints using a continuous strip of polyethylene, 150 mm (6") wide and 0.15 mm (.006")

thick, glued on using a compatible adhesive.

3.4
Installation of rigid insulation

1. The surface on which sheet insulation is to be affixed must be flat. Sheet insulation must be fully pressed against the foundation wall surface and affixed using a patch of adhesive applied with a notched trowel at the recommended height.

***** END *****

PART 1 GENERAL**1. INCLUSIONS**Non-exhaustive list:

- .1 Fireproofing work shown on drawings.
- .2 Fireproofing required by current regulations and codes.
 - .1 Examine of all site documents and conditions, then propose ULC approved systems appropriate to the work.
 - .2 Comply with approved methods and used approved products directly related to approved systems recommended by the manufacturer.

2. REFERENCES

The year of modification of each standard is noted for illustrative purposes only.

Comply with applicable standards in effect (standard's last modification).

In the submission of shop drawings or other documents, specify the reference standards and the year of revision thereof, as well as the document that the manufacturer has considered.

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .2 Underwriter's Laboratories of Canada (ULC)
 - .1 CAN-ULC-S101-04, Standard Methods of fire Endurance Tests of Building Construction and Materials.
 - .2 CAN-ULC-S102-03, Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

3. DOCUMENTS/SAMPLES SUBMITALS

- .1 Provide submittals in accordance with Section 01 33 00 – Technical Drawings, Data Sheets and Samples.
- .2 Data sheets:
 - .1 Submit required data sheets, manufacturer's specifications and documentation.
 - .2 Define, for each specific case, the characteristics of applicable ULC products, performance criteria, dimensions, constraints and finish.
- .3 Quality assurance: Submit the following documents as per Section 01 45 00 – Quality Control:
 - .1 Test reports
 - .1 Submit required data sheets and certified copies of test reports and ensure that the fire-retardant coatings used on the substrates installed as part of the work are of a quality that meets or exceeds the requirements of these technical specifications.
 - .2 Submit test results as per CAN-ULC-S101 standards for fire endurance and CAN-ULC-S102 for surface burning characteristics.

- .2 Submit documents signed by manufacturer certifying that the products, materials and equipment meet the requirements for physical characteristics and performance criteria.
- .3 Submit implementation instructions provided by the manufacturer, including any indication of special handling criteria, application or cleaning procedures.
- .4 Manufacturer's Field Reports: submit manufacturer's field reports as described in PART 3 - FIELD QUALITY CONTROL, no later than seven (7) days following their completion, verifying that the work meets the specified criteria.

4. QUALITY ASSURANCE

- .1 Installer: company and person specializing in in the use of flame retardant coatings.
- .2 Work samples:
 - .1 Perform samples of required work as per Section 01 45 00 – Quality Control.
 - .2 Apply fire retardant over approximately 3 m² of surface to be treated.
 - .3 Work sample will be used for the purposes mentioned below:
 - .1 To evaluate workmanship, substrate, substrate preparation, equipment operation and material implementation.
 - .4 Perform work sample where designated.
 - .5 Allow 48 hours for work sample examination before proceeding with fireproofing work.

5. AMBIENT CONDITIONS

- .1 When outside temperatures are less than 5°C, ensure that 5°C air and substrate temperature is maintained during and for 24 hours following application.
- .2 Provide natural ventilation to properly dry fireproofing during and after application. In enclosed areas lacking openings for natural ventilation, ensure sufficient means to circulate and exhaust air to the outside.
- .3 Provide sufficient means and maintain relative humidity within limits recommended by fire retardant manufacturer for 5 days before application, during application, as well as 5 days following application.
- .4 In enclosed areas lacking openings for natural ventilation, provide minimum of 4 air exchanges per hour by forced air circulation.
- .5 Establish a system of trades prioritization for the areas subjected to simultaneous interventions by several contractors.
- .6 For indoor applications, provide temporary partitions or tarpaulins to prevent deterioration of coatings that could be exposed to adverse weather conditions.
- .7 Avoid exposing flame retardant coating to physical damage or abrasion.
- .8 Do not apply fire retardant coating to metal roof decking prior to completion of roofing work, including air handling systems. Prohibit any traffic on the roof until sprayed fireproof coatings are cured and dry.
- .9 Do not apply fire retardant plaster until all necessary anchors, staples and other fasteners are mounted on the framing, as these installations would command the puncturing of fire-retardant coating after completion.
- .10 Ducts, pipes and other obstructions that would interfere with or impede the fire-retardant coating shall not be installed until the fireproofing is complete. All who are already in place shall be carefully protected.

6. TRANSPORT, STORAGE AND HANDLING

- .1 Deliver, store and handle materials as per Section 01 61 00 – General Product Requirements and as per manufacturer's written instructions.
- .2 Deliver products in their original, closed container bearing the mark, manufacturer's name, and ULC certification.
- .3 Store and protect materials from weather in accordance with manufacturer's temperature and humidity recommendations.
- .4 Shelf life must be indicated on the packaging and application shall be performed before expiry date. Open or damaged containers shall be rejected.
- .5 Protect adjacent surfaces and materials from damage that may be caused by projection beyond intended limits, dispersion and chalking of fire retardant.

7. WARRANTY

Fireproofing Contractor shall submit a written guarantee, validated by the General Contractor, certifying that they both agree to repair or replace spray-on fire-retardant coatings that have laying deficiencies de within the prescribed warranty period.

- .1 Materials and labor: one (1) year against defects. See Section 01 78 36.

PART 2 **PRODUCTS**

1. MATERIALS

- .1 ULC approved GRACE OR CAFCO or approve equivalent systems, methods and products, as per CAN-ULC S101 and CAN-ULC S102, as well as any other applicable regulation making total assembly 1 hour fire resistant.
- .2 Sprayed-on flame retardant systems, application methods and cementitious products as manufactured by **GRACE, CAFCO, AD Fire** or approved equivalent. Asbestos-free, ULC-approved hydraulic binders based, qualified for use in ULC designs specified, and showing no signs of mold or fungus growth after a 28-day exposure period.
- .3 Curing compound: of the type recommended by the flame retardant manufacturer and qualified for use in ULC designs specified.
- .4 Minimum dry density and cohesion/adhesion properties of the fire retardant applied by projection shall be in accordance with the requirements of the applicable Quebec Standard, Regulations and Construction Code.

2. CEMENTITIOUS THERMAL BARRIER

- .1 ULC-approved flame retardant spray-applied hydraulic cementitious materials approved for use in specified ULC designs.
 - .1 ASTM E84 Surface Burning Characteristics:
 - .1 Flame spread index of 0.
 - .2 Fumes clearance rating of 0.
 - .2 ASTM E136 Combustibility: Non-combustible product.

- .3 ASTM E605 Density: 350 kg / m³ min.
- .4 ASTM E736 Cohesion / adhesion: 20 kPa min.
- .5 ASTM E759 Flexural Strength: No delamination, cracking or peeling.
- .6 ASTM E760 Impact Resistance: No delamination, cracking or peeling.
- .7 ASTM E761 Compressive Strength: 200 kPa.
- .8 ASTM E859 Forced Air Erosion: 0.00 g. / m².
- .9 ASTM E937 Corrosion: No evidence of corrosion.
- .10 ASTM G21 Mold: No sign of growth.
- .2 A/D TC-55 Sealant: allow 28 days curing before sealant application. Provide a "strong" layer.
- .3 Reference product
 - .1 TYPE 5MD by A/D Fire Protection Systems or approved equivalent.

3. ACCESSORIES

- .1 Primer: Product of the type recommended by the flame-retardant manufacturer and approved for use in specified ULC designs.
- .2 Adhesives: Provide necessary adhesive products and ensure that they comply with the manufacturer's requirements for the adhesion of the fire retardant coating. Although the following products are acceptable, check for the one that may be required in the selected approved test result:
 - .1 TC-55 water-based acrylic emulsion or approved equivalent.
 - .2 DK cementitious coating for roof decks or flat decking boards without ribs.
- .3 Wire mesh and reinforcement: Diamond Mesh for painted areas where adhesion is a problem, when interlocking is desired, or where intermediate reinforcement is required by the result of selected approved test or UL / ULC general clauses. Mechanical anchors or welding are required.
 - .1 Wire mesh strip for large sized primed or painted beams and columns: use medium gauge mesh (2.5 lbs / square yard). Follow UL / ULC guidelines to establish the width of the bands and the overlapping area of the affected beams and columns.
 - .2 Embedding or interlocking: use intermediate grade wire mesh (2.5 lbs / square yard)
 - .3 Overlap or bridging sub-face: use wire mesh gauge imposed by the selected ULC / cUL / UL tested concept.
- .4 Surface treatment: water based acrylic emulsion with a light surface film for subsequent paint application, such as A/D TC-55 or approved equivalent. Medium concentration layer recommended.

PART 3 EXECUTION

1. MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.
- .2 Final thickness shall be measured using an electronic thickness gauge for dry film. For the method of determining thickness and tolerances, refer to: AWCI Technical Manual 12-B (Standard Practices for Testing and Inspection of field-applied fire resistant materials.

2. PREPARATION

- .1 Ensure underlying surfaces (supports) are free from substances that would impair bond.
- .2 Verify that painted substrates are compatible and have suitable bonding characteristics to receive fireproofing.
- .3 Remove incompatible materials.
- .4 Ensure that items required to penetrate fireproofing are placed before installation of fireproofing.
- .5 Ensure that ducts, piping, equipment, or other items which would interfere with application of fireproofing are not positioned until fireproofing work is completed.
- .6 Maintain relative humidity within the recommended limits of the fire retardant manufacturer. Provide sufficient means to achieve the recommended humidity content for 5 days before, during, as well as 5 days after application.

3. IMPLEMENTATION

- .1 Begin fireproofing work only when the architectural work in the area concerned is sufficiently completed and approved by Ministerial Representative.
- .2 Begin fireproofing work only when the sealing work (fire / smoke protection) of Section 07 92 00 at the location concerned is completed and approved by Ministerial Representative.
- .3 Start fireproofing work before the mechanical, electrical and process work, at the location concerned, in order to ensure the continuity of the fireproofing system and before the installation of conduits, appliances and specialized equipment. Coordinate the work of this section with that of the other sections.

4. PRODUCTS SETUP

- .1 Coat substrate with adhesive or primer according to manufacturer's requirements.
- .2 Apply fire retardant according to manufacturer's requirements.
- .3 Apply coating to the total thickness required by the tested concepts that apply to the project. The total thickness must sometimes be obtained in several spraying sequences. The minimum set time shall be maintained before spraying the subsequent layer.
- .4 Spray fire retardant to achieve a coating corresponding to that of the tested assemblies, or according to the calculation prescribed to meet the specified degree of fire resistance requirement.
- .5 Spray fire retardant onto the substrate, making as many passes as necessary to obtain a monolithic layer of uniform density and texture, as well as the desired thickness.
- .6 Spray fire retardant over beams, columns, wall rails, bracing frames and the like, making as many passes as necessary to obtain a monolithic layer of uniform density and texture, as well as the desired thickness.
- .7 Pack exposed surfaces of finished work to a smooth finish.
- .8 Apply curing compound to fire retardant coating based on hydraulic binders according to manufacturer's requirements.

5. FINISHING

- .1 Allow coating to cure for at least 28 days and apply a strong coat of sealant to encapsulate fire retardant cementitious coating.
- .2 Plan for cementitious product to be painted as per Section 09 91 26 – Interior Painting.

6. PATCHING

- .1 Patch damage to fireproofing caused by testing or by other trades before fireproofing is concealed, or if exposed, before final inspection. Ensure the perfect continuity of the fire protection system everywhere.

7. CLEANING

- .1 Proceed in accordance with Section 01 74 13 - Cleaning.
- .2 Clean surfaces not indicated to receive fireproofing of sprayed material within 24 hours period after application.
- .3 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

PART 1 – GENERAL**1.1****Definitions**

- .1 « Fire resistant separation » refers to National Building Code, modified with Code de construction du Quebec, Chapitre I, Bâtiment. This section does not concern Fire resistant separation without any fire resistance.
- .2 « Fire stopping and Smoke Seal », « fire stopping sealant » or « fire barrier » may be used in drawings and specifications. They all describe fire stopping assemblies as specified in this section.

1.2**Shop Drawings**

- .1 Provide submittals as directed in documents.
- .2 Submit shop drawings to show location, proposed material, reinforcement, anchorage, fastenings and method of installation. Construction details should accurately reflect actual job conditions.
- .3 Submit certified test reports from approved independent testing laboratories, indicating compliance of applied fire stopping with specifications for specified performance characteristics and physical properties.

1.3**Product Data**

- .1 Provide product data as directed in documents.
- .2 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Descriptions must be sufficiently complete to allow on-site recognition of the materials and components involved in the assemblies
- .4 Submit MSDS - Material Safety Data Sheets in accordance with SIMDUT indications. Material Data Sheet has to comply with Développement des ressources humaines Canada – Travail et de Santé Canada; information has to indicate VOC concentration.

1.4**Samples**

- .1 Provide samples as directed in documents.
- .2 Submit duplicate 300 x 300 mm samples showing actual fire stop material proposed for project.
- .3 Submit color chart available for all exposed products, for Consultant approbation.

PART 2 – Products**2.1****Fire stopping and smoke seal assemblies**

- .1 Fire stopping and smoke seal systems: in accordance with CAN-ULC-S115. Asbestos-free materials and systems capable of maintaining effective barrier against flame, smoke and gases in compliance with requirements of CAN-ULC-S115 and not to exceed opening sizes for which they are intended and conforming to specified special requirements described in PART 3.
- .2 Within the parameters described in this section, the Contractor is responsible for the choice of fire and smoke protection assemblies and their components; this choice is subject to the revision of Consultants. Take a survey of all the general and specific applications in the project and submit the assemblies according all requirements of the articles "Shop drawings" and "Product data" of this section, and include the approved assembly proposed for each situation with the product data of each component.
 - .1 When selecting assemblies and their components, consider, but not be limited to, the following conditions:
 - .1 Fire resistance of assembly;
 - .2 Movement tolerance of joints (dynamic and static movements)
 - .3 Material of crossed component or assembly;
 - .4 Material of penetrating services;
 - .5 Dimensions and configuration of openings;
 - .6 Dimensions of penetrating services;
 - .7 Amount of element penetrating an opening;
 - .8 Space between services and opening;
 - .9 Available colors when exposed;
 - .10 All other requirements stated in this section;
 - .11 All other condition that may influence the performance of the assembly.
 - .2 Select components and assemblies within the following manufacturers referring specific conditions. All the systems must come from a single manufacturer.
 - .1 Hilti Canada Lte;
 - .2 AD Firebarrier et Firestop Systems;
 - .3 Tremco;
 - .4 3M.
- .3 Components of the assemblies: ULC approved or approval by an officially recognized laboratory for this purpose, in accordance with ULC S-115, including relevant guides (no 40 U19.13 et 40 U19.15), or in the test catalogue published by one of the laboratories mentioned above.
 - .1 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control
 - .2 Insulation: Mineral batt insulation recommended by the manufacturer of fire stopping assembly.
 - .3 Heat sinks: as recommended by the manufacturer and compatible with the tested assembly.
 - .4 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.
 - .5 Primers: to manufacturer's recommendation for specific material, substrate, and end use.

.6 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.

.4 Fire-resistance rating of installed fire stopping assembly in accordance with NBC, modified with Code de construction du Québec – Chapitre I, Bâtiment, without being less than floor, roof, wall or partition assembly where they are located.

2.2 Particularities

.1 Fire stopping and smoke seal assemblies used for fire rated separations and acoustical assemblies:

.1 The insulation used in the assembly must be 50mm thick or more.

.2 Where low rise foam is required for fire stopping and smoke seal assemblies, foam density must be at least 960 kg/m³.

.3 Where trowel paste is required for fire stopping and smoke seal assemblies, paste density must be at least 640 kg/m³, and hardness at least 60 (Shore A).

.2 Paintable sealant for non dynamic joints in exposed areas: Acrylic-based and paintable.

.1 CP 606 Flexible Firestop Sealant de Hilti or TREMstop Acrylique (GG) de Tremco, or other approved system.

.3 Mastic for dynamic joints located in exposed areas: Self-leveling (horizontal use), anti-sag (vertical use), sprayable, and other types as required, selected from the manufacturers products list above, in the colour chosen by the Consultant when exposed; Colours not matching adjacent surfaces will not be accepted.

.4 Dust-free installation: as indicated when required.

.5 Movement tolerance: as indicated when required.

.6 Removable fire stopping and smoke seal assemblies for later access: as indicated when required.

PARTIE 3 – EXECUTION

3.1 Preparation

.1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.

.2 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.

.3 Maintain insulation around pipes and ducts penetrating fire separation without interruption to vapour barrier.

.4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

3.2 Installation

.1 Install fire stopping and smoke seal material and components in accordance with manufacturer's certified tested system listing.

.2 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.

.3 Provide temporary forming as required and remove forming only after materials have

gained sufficient strength and after initial curing.

- .4 Tool or trowel exposed surfaces to neat finish.
- .5 Remove excess compound promptly as work progresses and upon completion.

3.3 Quality Control

- .1 Notify Consultant when ready for inspection and prior to concealing or enclosing fire stopping materials and service penetration assemblies.
- .2 Destructive tests, at randomly selected locations, may be performed by the Consultant to verify the installed components in the fire stopping and smoke seal assemblies. Consider replacing the assembly over a distance of 300 mm of joint, or 100 mm in diameter in the case of openings, at about 10 different locations.

3.4 Location of fire stopping and smoke seal assemblies

- .1 The fact that the drawings do not indicate all areas to be sealed will not relieve the Contractor of its responsibility to seal all areas where such products are normally required to provide a continuous fire resistant and/or smoke and gas tight barrier. This article also applies to all other sections that refer to this article regarding the supply and/or installation of fire and smoke protection systems.
- .2 Fire stop and smoke seal at:
 - .1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.
 - .2 Top of fire-resistance rated masonry and gypsum board partitions.
 - .3 Intersection of fire-resistance rated masonry and gypsum board partitions.
 - .4 Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.
 - .5 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.
 - .6 Openings and sleeves installed for future use through fire separations.
 - .7 Openings and sleeves installed for future use through fire separations.

3.5 Cleaning

- .1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
- .2 Remove temporary dams after initial set of fire stopping and smoke seal materials.

***** FIN *****

PART 1 - GENERAL

- | | | |
|---|----|---|
| 1.1
Description | .1 | The present section is for waterproofing and caulking products that are not prescribed in any other section. Refer to pertinent sections to learn information concerning all waterproofing and caulking products not described hereafter. |
| 1.2
Reference standards | .1 | CAN/CGSB-19.13, One-component elastomeric waterproof putty with chemical polymerization. |
| | .2 | CGSB19-GP-14M, One-component butyl-polyisobutylene base with solvent evaporation by polymerization |
| | .3 | CAN/CGSB-19.18, one component waterproof product, silicone base with polymerization by solvent evaporation. |
| | .4 | CAN/CGSB-19.24, Multi-components waterproof putty with chemical polymerization. |
| | .5 | Federal standards: TT-S-001543A, type "NON SAG". |
| 1.3
Qualifications of applicator | .1 | Sealant works must be done by contractor specializing in sealant application. Contractor must prove his competency before starting works. |
| 1.4
Samples, technical data of products | .1 | Submit required samples as prescribed in section 01 33 00 – Submittal procedures. |
| | .2 | Submit all technical data for products used as per section 01 33 00 – Submittal procedures. |
| 1.5
Work samples | .1 | Produce required samples as prescribed in section 01 33 00 – Submittal procedures. |
| | .2 | Samples must show the location, dimensions, profile and depth of joints, including back-up joint, primary, waterproofing and caulking product. Samples can be part of finished work. |
| | .3 | Wait 24 hours before starting waterproofing work so Ministerial representative can inspect samples. |
| 1.6
Delivery, handling and storage | .1 | Deliver and store materials in their original containers and packaging, bearing intact seal of manufacturer. Preserve materials from water and frost. Do not place directly on ground or floor. |
| 1.7
Requirements related to environment safety | .1 | Comply with requirements of information system concerning dangerous goods used at work (SIMDUT) pertaining to their use, handling, storage and disposal of dangerous goods also to labeling and supply of signalization data recognized by Work Canada. |
| | .2 | Respect recommendations from manufacturer concerning temperatures, relative |

humidity percentage and humidity content of support needed for application and drying of waterproofing products. Follow special directives relative to their use.

- .3 In building occupied by tenants, ventilate work area with adequate blowing fans and portable extraction appliances.

1.8 Management and disposal of garbage

- .1 Sort and recycle garbage as per regulation in force.
- .2 All substances corresponding to definition of toxic or dangerous goods must be placed in designated containers.
- .3 In view of upcoming disposal, make sure that empty containers are sealed then stored correctly, out of reach of children.
- .4 Dispose of surplus finishing and chemical products as per governmental, federal, provincial and municipal regulations in force.
- .5 Return saturated oil or solvent cloths used during works so they are disposed of appropriately, cleaned or treated for recuperation of contaminants.
- .6 For accomplishment of works foreseen in this present section, use waterproofing products, adhesives, sealing, caulking and finishing products that are the least toxic possible.
- .7 Close and properly seal adhesive containers and waterproofing product that are partly used. Store them at moderate temperature in a well ventilated fireproof area.
- .8 After use, place containers and adhesive tubes, waterproof products in designated areas for storing dangerous goods products.

1.9 Manufacturer's representative

- .1 Ask for a representative of the manufacturer of waterproof product to visit site before beginning works, so he can discuss procedure with designer and contractor.

1.10 Guarantee

- .1 All waterproof works, including products and manpower must be guaranteed against lost of waterproofing due to bad installation of product, bad preparation of substrate or bad quality of product, for a five (5) year period, starting at date of definitive approval of certificate.

PART 2 - PRODUCTS

2.1 Waterproof products

- .1 Caulking and waterproofing products used must satisfy following requirements:
 - .1 Must be as per pertinent safety standards, industry performance and government regulation or better.
- .2 Must be produced and transported so all steps of procedure, including

disposition of generated garbage, as per government laws and regulations are followed. In case of installation in Canada; they must also comply with Fish and game laws and Canadian environmental protection laws.

- .2 Caulking and waterproofing products must not contain following components nor be produced with them: aromatic solvents, talcum fibers or asbestos, formaldehyde, halogen solvents, mercury, lead, cadmium, hexavalent chromium, barium or derivatives, with the exception of barium sulphate.
- .3 Caulking and waterproofing products must not contain more than 5% in weight (total) of volatile organic components (COV), percentage calculated from stated quantities of components used in preparation of product.
- .4 With goal of minimizing health risks and maximize product performance, it is important that they are accompanied with detailed instructions concerning their application methods and necessary information regarding disposal of waste.
- .5 Caulking products having strong odors, containing toxic chemical products or not certified as being of type resisting to moulds must not be used in air treating appliances.
- .6 If it cannot be done otherwise, restrain use of toxic product to areas where emanations can be evacuated towards exterior or in areas where they can be confined in the back of air barrier, or again apply many months in advance, before premises are occupied to allow evacuation of emanation for the longest period possible.
- .7 Product chosen to do the works of present section must present the following characteristics: produced without any component susceptible of harming ozonosphere in high atmosphere.
- .8 Production process must be as per regulations for analysis of life span cycle stated in ISO 14040/14041 standard (t printed in 1998) and CSA Z760-94.
- .9 Selected waterproofing products must be on list of approved products published by Approval Commission of Waterproof Products of ONGC (CGSB). In the case of approved waterproof products with a primary, use only primary in question with said waterproof product.

2.2**Waterproof products -
General description**

- .1 Two component waterproof putty with urethane base
 - .1 None sagging product, as per CAN/CGSB-19.24 standard.
 - .2 Color identical to existing facing. (color : Aluminum).
 - .3 Acceptable product: Dymeric from Tremco or SONOLASTIC NP2 from SONNEBORN.
- .2 One component waterproof putty with urethane base.
 - .1 Non sagging product, as per CAN/CGSB-19.13 standard, of type 2, MCG-2-40 or meeting TT-S-001543A, type « NON SAG » standard.
 - .2 Color identical to existing adjacent facing (color: gray, aluminum).
 - .3 Acceptable products: Dymonic from Tremco SIKAFLEX 15 LM from Sika and SONOLASTIC NP 1 from SONNEBORN.
- .3 Two-component polysulphide fuel resistant sealant:
 - .1 Non-sagging product, compliant with STM C920, Class 25 and CGSB-19.24.
 - .2 The colour shall be identical to the adjacent facing (colour: grey)
 - .3 Acceptable products: SIKa DUOFLEX NS

2.3**Waterproof products –
Locations**

- .1 Around openings made on exterior walls;
- .2 Dilatation and break joint made in exterior wall;
- .3 Sealing at plan sealing vapor barrier;
- .4 Sealing constituting a rainscreen in aluminum panels;
- .5 Make a sealant joint at junction of all different materials.

2.4**Back-up joint**

- .1 Vertical and horizontal joints not exposed to circulation:
 - .1 Closed cell, polyethylene round rod foam, compressible, exterior covered with anti-adherent film, available in many widths between 3/8" and 4". Rods will be 25% bigger than openings to be filled.
- .2 Horizontal joints exposed to pedestrian circulation:
 - .1 Loose cell polyethylene foam, high density, covered with anti-adherent film.

2.5**Anti-adherent ribbon**

- .1 Polyethylene ribbon not adhering to waterproof putty, available in required widths stated on drawings.

2.6**Cleaning products for joints**

- .1 Non-corrosive and non-messy cleaning products compatible with joints and waterproof products, recommended by product manufacturer.

PART 3 - WORK

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- | | | |
|---|----|--|
| 3.1
Protection of works | .1 | Protect works done by third party against dirt and contamination of all kinds. |
| 3.2
Joint touch-ups on existing surfaces | .1 | Remove existing sealant joint to be redone and existing back-up joints, where indicated on blueprints. Take all necessary precautions not to damage existing surfaces. |
| | .2 | Get rid of all trace of existing sealant on surfaces joints and of all undesirable matter, including dust, rust, oil, grease and any other foreign matter susceptible of being detrimental to achievement of works or its efficiency. |
| | .3 | See that joints surfaces are very dry and not frozen. |
| | .4 | Apply primer, back-up joint, separating ribbon and waterproof product as prescribed in present section. |
| 3.3
Preparation of surfaces | .1 | Check dimensions of joints to be made and state of materials to obtain a good adequate report width-depth in regard to implementation of back-up joints and waterproofing products. |
| | .2 | Get rid of joint on surfaces and all undesirable matter, including dust, rust, oil, grease and other foreign matter susceptible being detrimental to implementation or efficiency of works. |
| | .3 | Do not apply waterproof products on joint surfaces having been treated with filler, a hardening product, water repellent product or any other type of coating unless tests were done beforehand and compatibility of these products is confirmed. Remove coatings already covering surfaces, if need be. |
| | .4 | See that surfaces are very dry and not frozen. |
| | .5 | Apply primer on surfaces as recommended by manufacturer |
| 3.4
Application of primer | .1 | Before applying primer and caulking product, use masking tape on adjacent surfaces to prevent dirt marks, if need be. |
| | .2 | Apply primer on lateral surfaces of joint immediately before putting waterproofing product, as per instruction of manufacturer. |
| 3.5
Installation of back-up joint | .1 | Install an anti-solidarization ribbon in required areas, as per instruction of manufacturer. |
| | .2 | By compressing it by about 30 %, install back-up joint as per depth and profile of joint desired. |
| 3.6
Preparation of waterproof | .1 | Mix materials respecting rigorously instruction from manufacturer for waterproofing product. |

product**3.7
Implementation**

- .1 Application of waterproof product
 - .1 Implementation of waterproof product as per written instruction from manufacturer.
 - .2 To make clear joints, install a masking tape on edges of surfaces to be jointed, if need be.
 - .3 Apply product forming a continuous waterproof cord.
 - .4 Apply waterproof product with a gun having a nozzle of proper dimension.
 - .5 Feeding pressure must be strong enough to allow filling of empty spaces and to produce perfect blocking of joints.
 - .6 Make joints to form a continuous waterproof cord, free from crests, folds, sagging, empty air pockets and covered dirt.
 - .7 Before a skin is formed on joints, fashion apparent surfaces to give them a lightly concave profile.
 - .8 As work progresses, remove surplus of waterproof product up to the end of it.
- .2 Drying
 - .1 Ensure drying and hardening of waterproofing products as per instructions of product manufacturer.
 - .2 Do not cover joints with waterproof products before they are completely dry.
- .3 Cleaning
 - .1 Clean immediately all adjacent surfaces. Leave work clean and in perfect order.
 - .2 As work progresses, remove surplus and smears of waterproofing product with recommended cleaning products.
 - .3 Remove masking tape after joints are settled.

*****END*****

PART 1 – GENERAL

1.1	List of non-limitative works for this section:
Range of works	1. Supplying and installation of steel doors and frames.
1.2	1. Hardware.....Section 08 71 10E
Related works	2. PaintSection 09 91 26E
1.3	1. ASTM A366-85, Specification for Steel, Carbon, Cold-Rolled Sheet, Commercial Quality.
Reference standards	2. ASTM A525-86, Specification for General Requirements for Steel Sheet inc-Coated (Galvanized) by the Hot-Dip Process.
	3. Canadian Steel Door and Frame Manufacturers' Association (SDFMA), "Canadian Manufacturing Specifications for Steel Door and Frames", 1982.
	4. NFPA 80-1986 Fire Doors and Windows.
1.4	1. Shop drawings must indicate every type of door, material used, core thickness, mortise assembly, reinforcement pieces, location of apparent fixings, openings, glazing, louvers, position of hardware pieces and fire resistance index.
Shop drawings	2. Shop drawings must indicate each type of frame, material used, core thickness, reinforcement pieces, glazing beads, location of apparent anchoring and fixings and types of coating finish.
	3. Include table where each door and frame are identified, indicators and door numbers corresponding to numbers indicated on drawings and on door table.
1.5	1. Steel frames must be made in Quebec and answer to requirements of Permanent Committee and interdepartmental purchases.
Material origin	
1.6	1. Steel fire stopping doors and frames: bearing authorization label from accredited organism by the Canadian council of standards and who's prescribed or indicated fire resistance index is as per CAN4-S104M-80 (revised in 1985) and CAN4 S105M-1985 standards.
Requirements from regulation	
1.7	1. Work carried out in two phases, see drawings limits.
Scheduling	2. Scheduling, see section 01 32 18E and directive Ministerial representative.
	3. The place of work is within an occupied building.
1.8	1.
Waranty	2. Provide a certificate of guarantee, signed and issued on behalf of the Ministerial representative, stating that all the works in this section are warranted against defects for a period of five (5) years from the date of signature of the certificate of provisional acceptance work. Comply with section 01 78 00E.

PART 2 – PRODUCTS

2.1 Materials

1. Galvanized steel sheet: Commercial quality steel sheet, as per ASTM A526 standards with W025zinc applied by wiping.
2. Steel plates to be folded, as per CAN3-G40.21-M81 standard, nuance 300W.
3. Fire stopping doors and frames: built fire stopping doors and frames as per requirements of regulation organisms and affix authorized seals. Unless stated otherwise, minimal thickness of galvanized steel base used for doors must be 1,2 mm (cal 18) and for frames, 1,6 mm (cal 16).
4. Doors:
 - 4.1 Interior doors "fire resistant", 1hr 1/2, and acoustic STC-42 according to ASTM E90-85 standards, 44,5mm (1-3/4") thickness. See door schedule height and width.
 - Structure and reinforcements of door fire: 1hr 1/2 fire resistant and STC-42 acoustical performance;
 - Reinforcements for hinges, gauge 10;
 - Reinforcement for surface mounted hardware gauges 10;
 - Core of doors "fire resistant":
 - Vertical stays and of steel frame. Interior filled with acoustical materials, ULC approved.
5. Three section frame, thickness of construction steel:
 - 5.1 Door frame for acoustical and fire resistant doors: gauge 14.
6. Stops: Simple black neoprene posts, pressure inserted in all pre-drilled holes.
7. Provide other components for doors and frames as per requirements of CSDFMA or needs.

2.2 Production

1. Unless stated otherwise, steel doors and frames must be made as per provided details and as per requirements of "Canadian Manufacturing Specifications for Metal Doors and Frames", 1982, document published by the "Canadian Steel Door and Frame Manufacturers' Association" (SDFMA). Doors and frames must be reinforced in a way to satisfy requirements indicated for hardware pieces stated in section 08 71 10E – Hardware.
2. Cut, reinforce, pierce and screw doors and frames where necessary to be able to receive hardware parts to mortised doors provided by Ministerial representative: adjust to their existing dimensions. Reinforce perimeter of these openings and for door itself. Reinforce frames to be able to receive hardware parts to be mounted on the surface.
3. Prime, in shop, cold laminated steel sheets.
4. Apply, in shop, a primer for touch-ups where zinc was damaged.

2.3 Insulated doors – ULC

1. Longitudinal edges must be done without apparent joint, welded, trimmed with filling material, then smooth by sanding;

2. Insulated steel door and frame, 1H 1/2 fire resistant sound control, according to ASTM E90-85 standards. The door will be made of gauge 14 steel, 45 mm thickness, with all the necessary reinforcements for hardware. The core has to be filled with acoustical material, ULC approved.
3. Caliber 14, thickness 45 mm with reinforcement n° 10 to receive hardware. Vertical stays and steel frames. Interior to be made of approved ULC materials. Finish done in shop with rustproof zinc chromate base paint.

2.4

Frames

1. Cut miters and joints well and weld making a continuous cord inside section.
2. Grind joints and welded angles, trim them with metal filling paste then rub down until finish is smooth and uniform.
3. On frames, install mounting feet allowing anchorage of frames to the ground. Install masonry anchoring, protection boxes for striking plates etc, as needed.
4. For each simple door, install three (3) stoppers on the frame to receive striking plate; in cases of double doors, install two (2) of them on lintel.
5. For doors separating a heated space from another unheated one, make frames with thermal bridge breaker for external doors. Use insulating polyvinyl chloride insulation to separate exterior components from interior ones.
6. Build opening for glazing and install glazing bead needed as indicated. Faces of screws must be flushed with metal of glazing bead.

PART 3 – WORK**3.1****General installation**

1. Install fire stopping doors and frames as per requirements of volume 4 of the National fire prevention code produced by the National Fire Protection Association (NFPA) 80.

3.2**Door installations**

1. Doors, frames and hardware pieces are covered under Section 08 71 10E.
2. Leave a uniform space between doors, frames and framing posts and between doors and floor, as follows :
 - 2.1 Hinge side: 1 mm.
 - 2.2 Bolt and lintel side: 1,6 mm.
 - 2.3 Floor side: 6 mm.

3.3**Frame installations**

1. Install frames plumb, square and on level, to appropriate height.
2. Fix anchoring devices and connections to continuous component of structure.
3. Maintain frames with braces during installation work. Temporarily install wooden braces placed horizontally to the third of opening, to maintain constant width of frames. When opening width is over 4'-0", support cross-beam in centre with vertical stay. Remove braces and supports once frames are completely installed.
4. Leave enough space for flexion to ensure that pressure made on structure is not transferred to the frames.
5. For ULC assemblies, coordinate installation steel frames with the 09 21 16E division to ensure continuity and the integrity of fire-resistant separation.
6. To be coordinate with drawings

***** END *****

PART 1 – GENERAL

- | | | |
|--|----|---|
| 1.1
Range of works | 1. | Supply and installation of hardware for required doors. |
| 1.2
Reference standards | 1. | Normal installation of hardware pieces must be as per requirements of Canadian metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturers' Association. |
| 1.3
Requirements from regulatory organism | 1. | Use hardware pieces approved and labeled by ULC for fireproof doors and emergency exits. |
| 1.4
Shop drawings | 1. | Submit shop drawings as per Section 01 33 00E. |
| | 2. | Clearly indicate construction details, forms of components, assembly and fastening mode or any other pertinent detail. |
| 1.6
Hardware list | 1. | Submit a list of hardware pieces as prescribed in Section 01 78 00E. |
| 1.6
Maintenance material | 1. | Provide two (2) sets of wrenches necessary for closed door locks and accessories for emergency exits. |
| 1.7
Delivery and storage | 1. | Store finishing pieces of hardware in clean, dry, locked room. |
| | 2. | Wrap separately or by group each similar piece of hardware and label each bundle as to their nature and placement of the piece. |
| 1.8
Guarantee | 1. | Provide a certificate of guarantee, signed and issued on behalf of the Ministerial representative, stating that all the works in this section are warranted against defects for a period of five (5) years from the date of signature of the certificate of provisional acceptance work. Comply with section 01 78 00E. |

PART 2 – PRODUCTS

- | | | |
|--------------------------------------|----|---|
| 2.1
Hardware pieces | 1. | Only door checks and sets of locks and bolts being on the list of approved products given by ONGC will be acceptable for the present works. |
| | 2. | Use product coming from same manufacturer for pieces of same nature. |

2.2
Qualities

1. All hardware, not otherwise specified will be of typical template. Give to frame and door manufacturer templates, patterns and all other required information for preparation of frames and doors. Give to manufacturer of fireproof doors, all pieces that must be inserted or fixed into these doors, if need be.
2. All sliding bolts, dead-bolts, auxiliary bolts, faces, locks and followers, latches, cylinders, cylinder necks, latches, door pull plates, pull handles, mechanisms, coordinators, bolts, door stopper, stoppers or door holders and close door arms will be made of aluminum.
3. Buttons, rosaces, headstall or plates and lock striking plates, bolts cases for emergency doors will be brass or bronze.
4. Lock cases will be of cast iron and mechanism will rust resistant steel. Protective boxes for striking plates will be made of pressed steel.
5. Keys will be made of a nickel-silver alloy.

2.3
Finish

1. Unless stated otherwise, all apparent finishing hinges will be chrome satin plated as per 626/652 standard. Hinges will be made of stainless steel. Pull handles, push and foot plates will be in stainless steel, finish 630. Boxes for close-doors will have a natural anodized finish 628.

2.4
Hardware pieces for doors

1. For list and description of all door hardware pieces, refer to inserted charts on architectural Drawings.

2.5
Fastening devices

1. Provide screws, bolts, expansible plugs and other fixation devices necessary to fix hardware properly and for the good order of hardware pieces.
2. Apparent fixation devices must be assorted to hardware pieces finish.
3. Where a traction handle is needed on one of the faces and a push plate, on the other face of door, provide fixation pieces needed to install in a manner that handle is fixed on both sides of door. Install push plate to hide fixations.
4. Use fixation pieces made of compatible material with the one they are passing through.

PART 3 – WORK**3.1**
Installation instruction

1. Provide complete instructions and installation templates essential to metal door and frame manufacturer to allow them for preparation of their products to receive anticipated hardware pieces.
2. Each hardware piece must be accompanied with installation instruction from manufacturer.
3. Install hardware pieces in normal positions as per requirements of Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by the Canadian Steel Door and Frame Manufacturers' Association.

4. If door stopper must touch tie-rod, install stopper so it touches the lower part or the tie-rod.

***** END *****

PART 1 – GENERAL

- | | |
|---|--|
| 1.1
Range of work | <ul style="list-style-type: none">.1 Non-exhaustive list:<ul style="list-style-type: none">.1 Clean existing and new surfaces to be painted and new finishes..2 Paint walls and partitions concrete block as described in plans..3 Paint all structures and accessories such as doors, frames, steel finish boards, mouldings, the structure of the crane, etc. |
| 1.2
Reference standards | <ul style="list-style-type: none">.1 Office of general standards of Canada (ONGC).<ul style="list-style-type: none">.1 CAN/CGSB-1.28, Interior alkyd resin paints for buildings..2 CAN/CGSB-1.132 Paint for primer coat, zinc chromate, low sensitivity to humidity..3 CAN/CGSB-1.Aluminum enamel paint with silicone-alkyd resin, resistant to heat..4 CAN/CGSB-1.146 Cover with epoxy resins paint, cold hardening, bright..5 CAN/CGSB-1.153 Cover with epoxy resins paint, high garnishing power, bright..6 CAN/CGSB-1.165 Paint for primer coating with epoxy resins, cold hardening..7 CGSB 85-GP-14M Painting of steel surfaces exposed to normal dry atmosphere..8 CGSB 85-GP-16M, Painting of galvanized steel..9 CAN/CGSB-85.100, Painting..2 Steel Structures Painting Council (SSPC).<ul style="list-style-type: none">.1 Systems and Specifications Manual, 1989..3 Architectural Painting Specifications Manual, Master Painters Institute (MPI). |
| 1.3
Condition for beginning work | <ul style="list-style-type: none">.1 Do not apply paint where work emitting dust is being done. |
| 1.4
Maintenance material | <ul style="list-style-type: none">.1 Deliver one gallon each of tint and finish used for interior wall surfaces..2 Use replacement material coming from the same production lot of material used for works..3 Colors and tints:<ul style="list-style-type: none">.1 All colors, intensity of tones and tints will be chosen by Ministerial representative during the course of the work..2 Where many coats are applied, the next to last coat of paint will of the color chosen and submitted for approval by Ministerial representative that reserve the right to change or modify their choice during the course of the works..3 Provide two colors. |
| 1.5
Inspection of rooms surfaces | <ul style="list-style-type: none">.1 Rooms will be thoroughly swept to remove any dust. Concrete work must have been finished for at least thirty (30) days. Masonry work must be completed and dry |

to be painted

enough.

- .2 Surfaces will be suitably finished, clean, dry, with regular appearance and texture and without of defect.
- .3 Unless reserves were made beforehand by Ministerial representative and/or the contractor, the beginning of work means implicit approval of conditions and of the state of surfaces on which work is to be done. The Contractor will be held responsible for the quality and the condition of finish, if not of first quality.

1.6
Climatic conditions

- .1 No paint, tint or preservative will be applied when temperature is inferior to 10°C inside and for exterior, when ambient temperature is inferior to 10°C and superior to 32 °C. No exterior finish will be applied during night, snow or after, until surfaces are dry.

1.7
General protection

- .1 Contractor will protect work against humidity or damage by whatever cause. Also protect adjacent works from any damage caused by workers, materials, tools or equipment used to do the work. Assume responsibility for adequate protection of works against any eventual damage caused by the execution of works related to this division or others.
- .2 Contractor must repair all damage, without cost to the ministerial representative and to the satisfaction of consulting-experts. If, in their opinion, these damages cannot be suitably repaired, damaged work will be replaced at the cost of the Contractor.

1.8
Guarantee

- 1. Provide a certificate of guarantee, signed and issued on behalf of the Ministerial representative, stating that all the works in this section are warranted against defects for a period of one (1) year from the date of signature of the certificate of provisional acceptance work. Comply with section 01 78 00E.

PART 2 – PRODUCTS
2.1
Materials

- .1 Approved materials: to do present works, use only paint material from list of approved products given by OGSC (O.N.G.C.).
- .2 Use paint material as per O.N.G.C. standard, mentioned on the list of paint systems for finish.
- .3 Material from each paint system must come from one manufacturer only.
- .4 Choice of: 1 colour for walls;
 1 colour for doors, frames;
- .5 On concrete block surfaces: tow (2) finish coatings, unless told otherwise;
- .6 On metallic surfaces: one (1) primer coating and three (3) finish coatings, unless told otherwise.
- .7 On gypsum surfaces: one (1) primer coating and three (3) finish coatings, unless told otherwise.

PART 3 – WORK

- 3.1 .1 Application of paint must not start before surfaces are suitable prepared. All surfaces

Surfaces preparation

must be solid, dry, and clean without dirt, dust, grease, rust, mortar projections, salts and foreign matters susceptible of compromising the good appearance of paint coatings.

- .2 Prepare existing doors and frames in the following way:
 - .1 Wash surfaces with a multi-purpose oxygen active cleaner as No 771-136 per Sico.
 - .2 Sand surfaces to attenuate glossiness.
 - .3 Exterior walls must be cleaned with pressurized air. Then, clean foundation walls up to the height of the garage doors with pressurized water. The device must deliver a minimal amount of water so as to not soak the surfaces.
- .3 Prepare plaster and plasterboard surfaces, as per ONGC 85-GP-33M standard. Fill small cracks with smoothing product.
- .4 Wash all gypsum surfaces with a multi-purpose oxygen active cleaner as No 771-136 per Sico. Sand all gypsum surfaces apply a primer as No 850-130 or 870-177 per Sico. Sand thereafter and dust between each coat of paint.
- .5 Protect all identifications, electrical conduit nomenclature, junction box to be painted, to coordinate with electrical documents;
- .6 Protect electrical panels, fire protection system and/or accessories, insulating pipes on the surface to be painted. Coordinate work with engineering documents;

**3.2
Application**

- .1 Sand and dust between applications of each coat of paint to correct defects visible at a distance of 1,5m.
- .2 After adjusting doors, finish edges and door frames according to requirements anticipated for door itself.
- .3 Finish the upper part and the projecting edges, above and below the line of sight, according to the requirements for the surrounding surfaces.
- .4 Finish metal electrical wire on the surface to be painted and junction box, to be coordinated with engineering documents.
- .5 Coordinate paint work, including methods of applications and periods to do the work.

3.3 Interior finish

- .1 **System for concrete block walls:**
 - .1 Existing surface concrete block surfaces:
 - .2 Prepare and protect areas and equipment adjacent to the surface to be painted.
 - .3 Protect the base wall baseboard on the surface to be painted and any other finishes in the room;
 - .4 Perform a test with the manufacturer to validate compatibility with the existing finish;
 - .5 Applying tow coats of Fast Cure Epoxy is a high solids, high build, fast drying, polyamide epoxy with a semi-gloss finish, such as SHERWIN WILLIAMS' MACROPOXY 646.
 - .6 Ensure ventilation of the room during the drying time, see also the manufacturer's recommendations.
- .2 **System for doors and steel frames and primed ferrous metal:**
 - .1 If need be, touch up naked areas with an alkyd primer for metal as per ONGC 1-GP-48 standard, such as CORROSTOP from SICO 635-785.
 - .2 Apply three (3) coats of acrylic urethane paint, eggshell finish and 0 COV such as Rust-Oleum S-37 Metalmax.

***** END *****